IMPACT OF STOCK MARKET PERFORMANCE ON CAPITAL FORMATION IN NIGERIA (1980 – 2018)

BY

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DECLARATION

I, Eyo, Eyo Itam with registration number BFN/Ph.D./15/006, hereby declare that this thesis on "impact of stock market performance on capital formation in Nigeria (1980-2018)" is original and has been written by me. It is a record of my research work and has not been presented before in any previous publication.

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CERTIFICATION

This is to certify that this thesis titled 'impact of stock market performance on capital formation in Nigeria (1980-2018)' and carried out by Eyo, Eyo Itam with registration number: BFN/Ph.D/15/006 has been examined and found worthy of the award of the Doctor of Philosophy (Ph.D) Degree in Finance.

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ABSTRACT

The study sought to assess the impact of stock market performance on capital formation in Nigeria between 1980 to 2018. As the aim is to ascertain the effect of all share index on capital formation, to examine the relationship between number of companies in the stock market and capital formation, to ascertain the effect of new stock issues on capital formation among others, the study anchored on the foremost growth model of Harrod (1939) and Domar (1946) popularly known as 'Harrod-Domar model'. Employing ex-post facto research design and the autoregressive distributive lag model as technique for analyzing relevant secondary data, basic relationships and effects were discovered. Based on the results, the study conclude that the relationship and effects of stock market performance on capital formation in Nigeria is generally significant to some extent in the short-run but positive and significant in the long-run. Flowing from these, the current study called for the need to foster continuous and sustained investments by investors and would-be investors in the stock market to boost capital formation, which may invariably lead to economic growth as well as considering constant evaluation and re-evaluation of corporate governance frameworks of quoted companies and would-be quoted companies to engender effective and efficient intellectual propriety towards expansion of production, which will have a multiplier effect on capital formation through stock market performance.

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CHAPTER ONE

INTRODUCTION

1.1 Background to the study

Based on Khalikov (2016) opinion, capital accumulation/formation is at the heart of development of the economy. In a country, capital is one of the most essential things that determines the quantity and composition of output. Increased capital resources in a country lead to technological breakthroughs, higher labour productivity, accelerated economic expansion and greater living standards for citizens. When long-term capital investments, such as machinery, tools, equipment, as well as dams, roads, trains, and bridges, are in short supply, this results in the country becoming locked in an endless circle of poverty.

The process of capital formation increases a country's capital stock by investing in productive plants and equipment, among other things. To put it another way, capital assets are increased by the amount of money invested, utilization of a country's resources to the greatest extent possible in material, financial, and human resources. On a constant and consistent basis, resource mobilisation is a prerequisite for a rise in the level of economic activity, and almost all economists, according to Owusu (2016), assert that the most essential predictor of economic growth is capital formation.

According to the capital formation concept, society, meanwhile, does not devote every one of its present productive endeavours to meeting the needs requirements and requirements for quick consumption, it rather devotes some portion relating to the production of a wide range of capital goods such as machines and infrastructures, as well as transportation resources, plants, and different types of real capital that is able to improve productivity. A significant part of the purpose of capital formation is to reroute

a part of existing social means to increase the stock of capital goods in order to enable future expansions in consumable production (Ogunrinola & Motilewa, 2015).

Domestic and external resources, respectively, can be used to build and increase capital formation. In a country where the stock market is one of the sources, domestic resources play a significant role in boosting development activities. On the other hand, domestic sources include voluntary and involuntary savings, government borrowing, idle resource usage, and deficit finance. In contrast, external sources include international economic assistance and donor country economic assistance.

Increased national income, savings drives, financial institution establishment, growth in rural savings, increased profit of public corporations, taxation, foreign aid, favourable trade conditions, import restrictions, and so on are all sources of capital formation in Nigeria. Being the most visible constituent of the capital market, the stock market should be a veritable vehicle for capital formation due to the financial sector's deregulation, which includes the capital market.

According to Jhingan (2004), capital formation involves three interrelated situations: real savings and their growth, the availability of credit and the capacity of financial institutions to accumulate funds and then channel them through preferred routes, and utilizing the savingsin favour of investing im capital goods are all required circumstances. The mobilisation of savings, which is the availability of resources from private investors and the government for capital production, is one of the requirements known as intermediation. Savings are invested where the money is put to good use in the development of capital goods. Savings must be invested through numerous investment channels in an economy to result in capital formation, with the stock market being one of them.

For any country to progress, capital formation is necessary. It assists in addressing the population's requirements in a developing economy. Capital formation

is enabled by the availability of capital, which leads to the establishment of diverse enterprises, the exploitation of natural resources, growth in income, and the satisfaction of human needs and desires. The stock market was created primarily to allow individuals, businesses, and governments to raise capital for economic goals. It assists in the raise of long-term funding for new initiatives by governments and enterprises to grow and modernise their industrial and commercial activities, as well as their infrastructure (Nwankwo, 1991). Funds can be raised through the stock market for new businesses, expansion of existing firms, and refinancing existing businesses. Surplus units can use the stock market to invest their excess funds in the economy. Furthermore, it provides rapid liquidity to those who possess equities and consider selling them to support capital development.

Essentially, capital formation through the stock market can be viewed from a company (XYZ) that is among the top ten manufacturer of a product (a piece of construction equipment, for example). This company's equipment is used by other businesses to make goods and services. XYZ is a publicly listed corporation that raises funds through the sale of shares and debt. The firm can use the proceeds from a new issue of XYZ common stock purchased by household savers for increased production and new product development to the benefit of the company's clients. When investors buy stocks and bonds issued by companies, the company can use the money to boost production and develop new products for customers. These activities, as well as their many knock-on effects, contribute to the country's capital formation.

Due to its capacity to mobilize and encourage savings and investment within the economy, the stock market is a highly specialized and well-organized financial sector that contributes to capital formation. It encourages the efficient deployment of resources to potential investors. The stock market has long been regarded as an institution with a significant influence on development and socio-economic progress of

emerging countries.Sellers and buyers can exchange securities that have been listed on the Exchange, and it also serves as a platform for recognized business and non-corporate sectors to generate funds..

A stock market is where you can buy and sell stocks of publicly-traded companies on a floor called an Exchange. It is also referred to as a collection of markets and exchanges where securities such as stocks in publicly traded companies, bonds, and other forms of securities are issued and exchanged. This trade is either through formal exchanges or over-the-counter (OTC).

OTC is made possible by the stock market, one of the Nigerian Stock Exchange (NSE) tiers.Companies that generate profits have their shares quoted at greater prices and are actively traded in the market. Firms could generate new capital from the stock market; as a result, it makes it easier to direct investors' funds to more productive routes. Also, the process of reinvestment and disinvestment in the sale of investments in securities of various companies occurs in the market. This method assists investments in the most profitable investment proposals and leads to the production of new capital assets. This characteristic channels funds to companies, on the one hand, for expansion purposes, which enable the creation of facilities and investors and individuals on the other hand who in turn may reinvest or save. These activities by companies, individuals and government leading up to capital formation.

It is critical to emphasize that the stock market is a subset of the financial system, and that it is frequently viewed as playing a vital role in serving the needs of investors by mobilizing funds and converting them into assets (Ndikumana, 2000). In this capacity, an efficient financial system allocates resources efficiently through financial intermediaries, ultimately discovering the most productive investment possibilities (Paramati & Gupta, 2011).

Controversies when it comes to stock market's effect and its performance in terms of the economy abound in literature such that schools of thought believe, on one side, that there is an effect and causal relationship. In contrast, some others are of the position that there is no causal relationship, and the presence of an effect has little or no significance to improvements in an economy. Literatures on stock market dating back to Levine (1997), Fama (1981) and more recently by Kvietkauskiene and Plakys (2017), Khalikov (2016), Adigwe, Nwanna and Ananwude (2015), Udoka and Anyingang (2014), Okonkwo, Ogwuru and Ajudua (2014), Abdul-Khaliq (2013), Osamwonyi and Kasamu (2013), Owolabi and Ajayi (2013), Rasaki, Saffiyah, Kamilu and Hakeem (2013) have identified varied relationships that exist in stock market performance and expansion of the economy. These researches have centered more on a single important reason why the stock market exists being in contributing to economic growth with little or nothing on other functions of the stock market or its performance.

Ogunleye and Adeyemi (2015) acknowledge that the growth of the market of equities is important as the market's role of intermediation helps to boost investment in the economy through mobilization of savings domestically and internationally for several economic activities by businesses as the stock market plays an important role in resource allocation, both as a source of funds and determinant of a company's value and borrowing capacity. Okonkwo *et al.* (2014) argue that if capital is not made accessible to economic units where demand is rising and productivity may be raised in good time, the development of the economy will be jeopardized, and the economy would stagnate.. Also, Onoh (2002) opined that with the help of the stock market, a tiny country firm may turn itself into a massive worldwide conglomerate, gaining all of the benefits of economies of scale, expertise, and a very visible international presence.

According to Bayar, Kaya, and Yidrim (2014), the stock market allows corporations to raise capital by issuing shares and provides a trading environment for

those shares, making it one of the financial structure's most significant constituent. It is the part of the financial system in charge of efficiently channelling funds from surplus to deficit economic units over a long period.

According to Levine and Zervos (1998), there is veritable vehicle in the stock market to fuel domestic savings by providing extra financial instruments that can be tailored to individual risk preferences and liquidity requirements for individuals and corporate bodies. Osaze (2007) asserts that institutions that generate, hold, distribute, and exchange financial assets, as well as those that engage in the obligations of managing long-term endeavours including gross fixed capital creation (formation), are all found within this portion of the financial system.

The NSE is a stock exchange in Nigeria that allows investors to purchase and sell a variety of financial instruments such as stocks, bonds, debentures, and government bonds. The Nigerian Stock Exchange (NSE) has a primary market for initial capital raising and a secondary market for secondary capital raising. It is possible for the government and industry get around obataining long-term fundin to support development initiatives while also expanding/improving existing operations and modernize their respective enterprises. Security transactions take place on the secondary market after securities have been issued on the primary market. It allows investors to reclaim liquidity and spread their risk while borrowers such as the government and industry keep the money they put in (Alile, 1996; Olowe, 1997; Sule & Momoh, 2009; Okonkwo *et al.*, 2014).

The first government securities were floated in Nigeria in 1946; however, institutional facilities for the operation lacked at the time. A total of fifteen years passed between the establishment of the Nigerian Stock Exchange and its first trading session in 1961. In 1953, the Nigerian government established a commission, which was led by Professor R. H. Barback, with the goal of supporting the development of the country's

stock market.In the Commission's report, which was released in 1959, it was recommended that, among other things, facilities for trading in stocks and bonds be established, transfer regulations be established, and savings incentives be implemented, as well as the issue of bonds by the government and other organizations.This report resulted in the formation of a stocks exchange in Nigeria (then known as the Lagos Stock Exchange) on September 15, 1960, with the support of the business community, the Nigerian Industrial Development Bank (NIDB) Limited, and the Central Bank of Nigeria, among other organizations.

Because the allocative function of the stock market is essential to determining total economic development, its availability encourages capital formation and socioeconomic development. For capital formation to occur, the stock market must develop properly. As a result, the Nigerian Stock Exchange's (NSE) role as a stock market in the economy is a capital production engine tasked with various resources to achieve economic growth. However, because the NSE has existed in the background since 1946, research on the effect of stock market performance has primarily focused on the economy, which is a broad spectrum of assessment of the phenomenon (stock market), and little or no research has been done as regards capital formation through stock market performance in Nigeria. One of the current study topics is narrowing the scope of analyzing the stock market's features.

This research is primarily concerned with the Nigerian Stock Exchange (NSE), which serves as the country's most visible reflection of the official capital market and is tasked with the primary responsibility of generating capital. The Nigerian Stock Exchange (NSE) is one of the capital market's institutions, specializing in the marketing and trading of various forms of securities. It is a collection of different entities and instruments that collaborate to achieve a common goal. There have been several other terms used to describe the market, such as the "hallmark" and "heart of the capital

market" performs a vital and necessary function in the operation of the financial system (Mbat, 2001).

1.2 Statement of the problem

Specifically, the research aim is to evaluate how well the Nigerian stock market is performing in terms of trading activity and other aspects, as well as identify how much it contributes to the country's capital formation process in the economy, assuming that a causal relationship exist linking the two, due to declining capital accumulation resulting from identified problems in Nigeria's stock market. The study aims to attract attention to measuring the attainment of the objective(s) of a stock market if one exists and drive research in that direction and determine if stock market performance characteristics affect capital formation in Nigeria as this is nearly inexistent in the country.

The stock market facilitates the raising of funds by corporations, governments, and international organizations, the Exchange of stocks through individual or institutional buying and selling, and the accumulation or formation of capital over time. Although it is often thought of the stock market serving as a guage in assessing expansion and development of the economy, capital accumulation that is actually the basis and wherewithal for expansion of an economy. Macroeconomic circumstances, which are frequently evaluated by many indicators and indices, have an impact on stock market performance. A healthy economy should have a beneficial impact on the formation of capital through the stock market and should lead to increased investment. Capital formation should result in the construction of pliable roads, buildings, infrastructures, entrepreneurial growth and storage facilities, among other things. It is worth noting that wherever it exists, the stock market should lead to capital formation. However, this is not the case in Nigeria, where there appears to be a lack of capital

formation due to the lack of ventures, despite its long history of having a stock market with its attendant functions.

There are a variety of responsibilities performed by the Nigerian stock market, including the mobilization and effective distribution of capital primarily as a means in meeting investment objectives. Expansion in economic conditions are enhanced consequent upon the market's establishment of institutions to mobilize savings from many excess economic units for productive purposes. However, the stock market's performance has always been questioned due to certain inherent problems in or affect the market. Listing criteria that are extremely strict, particularly in the first and second-tier markets, are one of these issues. Due to most Nigerian investors' buy-and-hold attitude,in addition, there is a lack of understanding among those that are wishing to invest, which results in low levels pf activity and insufficiency of capital in the market, as well. Other key difficulties include unfavorable economic conditions, which cause corporations to perform poorly as it pertains to availability of products and distribution of dividens, among other things when they are not operating at full or near full capacity.

Due to the long history of the Nigerian stock market, which dates back to 1960, as well as the country's substantial financial resources and existing institutions, it is reasonable to conclude that the bourse has not been active enough, particularly if comparison is attempted to be made of other emerging countries' units such as Japan and India, respectively. As a result of the factors mentioned above, Nigeria's stock market is beset by a slew of problems, including low trading activity and a persistent rise in demand for securities, which is met by a corresponding decrease in supply. High transaction costs, money supply, exchange rate fluctuations, lack of transparency in dealings, the spiraling effect of the global economic crisis, margin lending by banks, stock price rise that did not correspond to the fundamentals of the quoted firms,

unstable interest rates, and domestic terrorism are among the factors to blame. Investments are difficult to come by in this situation,making it difficult to achieve some, if not all, of the functions that a stock market can perform when it exists in a country.

When compared to Singapore, Germany, United States of America, South Africa, Egypt, and China, where tangible context between the stock market, its functions, and existence in their economies is experienced, in Nigeria, where the stock market has existed since 1960, cannot say how capital formation has been affected by performance of the stock market by means of which economic expansion is often assessed. The stock market in countries mentioned earlier has created incentives for growrh and profit, as well as risk management, making the market a strong source of capital formation. More particularly, stock market literature has focussed on the link and impact of the stock market on economic growth, covering a wide range of topics when evaluating the significance of stock market indices or stock market performance indicators. As a result, there are differing viewpoints on the actual effects of stock market performance in Nigeria.

Furthermore, investors have lost faith in the institutions operating in the arena due to illegal practices by some market participants, prompting funds to be diverted to areas other than the stock market where appropriate returns are more likely to be obtained. In turn, investors are less inclined to make financial investments in the stock market, which causes a reduction in the amount of securities traded on the market.

1.3 Objectives of the study

The purpose of this study was to examine the relationship between stock market performance and capital formation in Nigeria, which was a developing economy at the time of the study (1980-2018). On the other hand, the precise objectives are as follows:

1.6 Scope of the study

In terms of context, region, and time, the research focuses on the impact of stock market performance on capital formation in Nigeria between 1980 and 2018.

1.7 Significance of the study

It is important highlighting that the significance of research lies in the fact that it brings to light often-overlooked practical issues by stimulating further research in a subject matter or subjects-matter, adding to existing knowledge, and improving industrial applications of theoretical positions. To that end, this research will be useful to capital market practitioners, finance professionals, and finance enthusiasts in various ways. It will draw attention to the importance of a stock market by emphasizing one of its goals, capital formation.

This study will undoubtedly keep capital market practitioners on their toes as they seek new ways to encourage investors to use the stock market in their financial, retirement, and investment plans. The study will be a valuable reference point because it will shed more light on the ease with which individuals, firms, and conglomerates can accumulate capital through the stock market.

In terms of finance and financing enthusiasts, the current study sheds light on the various opportunities available in the stock market, its significance in capital formation, and the interface for a good mix of start-up or business expansion. As a result, business ventures and entrepreneurs will broaden their horizons in terms of capital generation.

Furthermore, investors, market participants, the government, and stakeholders, in general, are being educated about one of the stock market's most important functions in capital formation and how their actions have influenced it in one way or another as it leads to economic growth. Through this research, the group mentioned above will learn how to boost economic activity by mitigating the negative effects of interest rate

swings, utilizing equity returns, harnessing equity portfolio strategy, forecasting stock market performance, and creating a buffer against inflation and risks. The associated variables of stock market performance will also assist regulators in formulating policies to stimulate the market to increase capital formation for economic growth.

The results of thus study add to the volume of information already available on the subject under investigation, fill knowledge gaps, and provide researchers with a starting point for an in-depth investigation into this and area(s) that are related and relevant. This research follows in a similar vein,shall enable students and Academia to investigate the importance of a stock market through its various objectives. The style, theories, methods, conclusions, and recommendations carve a refined mode of further investigation(s) into this area.

1.8 Operational definition of terms

Because certain technical terms will be used throughout the study, it is necessary to define them to make the study's focus and end findings more understandable. These are some of the terms:

Capital formation: This refers to the net capital accumulation that occurs due to various stock market activities. It includes everything from listing companies on the Exchange to raising funds, introducing new issues to the market, selling or exchanging stocks, and utilizing the results of the activities as mentioned above.

All-share index: This is a set of figures that represents the changing average value of all firms' share prices on a stock exchange and can be used to determine how well a market is functioning in terms of performance. It's also a way of gauging stock market trends and performance, and it's used as a barometer to track price increases.

New stock issue: A stock or bond being sold to investors for the first time by a newly listed company or a company whose stock is publicly traded to expand production is

known as a new stock issue. It could be an initial public offering (IPO) of a firm, or it could be a new issue offered by a company that has already floated a large number of similar issues.

Market expansion:Refers to the gradual increase in demand for a certain product or service.Also known as growth in market size, itmay be delayed if buyers do not have a significant product or service demand, or it can be rapid if consumers find the product or service users at the price point.

Stock market performance: This is an aggregate of several stock market-specific parameters that are both endogenous and exogenous to the market, all of which affect market participants in one way or another.

Disinvestment refers to the sale of a manufacturing plant, a division or subsidiary, or a product line. The opposite of capital expenditures is sometimes referred to as disinvestment. When discussing disinvestment, the terms divestiture and divest are sometimes used.

Shares: A share is an indivisible unit of capital that expresses its relationship with its shareholders.

Shareholder: A shareholder of a corporation is a person who owns shares in the business and so receives a piece of the profits as well as the right to vote on how the corporation is operated.

Surplus Economic Unit: Throughout a period, an economic unit with income greater than or equal to consumption expenditure is referred to as a surplus economic unit. It earns more money than it spends on its basic requirements, allowing it to use the excess funds to participate in the economy by purchasing goods, making investments, or lending money to others.

Listing: Securities are admitted to trading on a recognized exchange when they are listed. It's also known as a quotation.

The market turnover ratio: This is often referred to as the share turnover ratio, and it is a measure of how simple or difficult it is to sell shares of a given stock on the stock exchange. It makes a comparison between the total number of shares that may have been traded during a certain period and the total number of shares that actually change hands during the same period.

The number of companies: The entire number of corporations or firms quoted and listed on the floor of a stock exchange whose shares are traded or exchanged among market players, also known as investors, buyers, and sellers, is the number of companies.

CHAPTER TWO

THEORETICAL FRAMEWORK AND LITERATURE REVIEW

2.1 Theoretical framework

The Harrod-Domar model, one of several postulates in the range of growth theory, serves as the study's theoretical foundation. The research is also linked to other ideas, such as financial intermediation theory and modern portfolio theory. Their contributions to achieving the study's aims are based on the propositions of these theories, which serve as the foundation for filling a gap in the literature.

2.1.1 Harrod-Domar model

Harrod and Domar (1939, 1948) devised the Harrod-Domar model, a basic Keynesian economic growth model (1946). It is a word used in development economics to explain its growth rate in savings and capital productivity. It implies that there is no natural need for an economy's growth to be balanced. As a result, greater investment is encouraged, assisting emerging countries in pursuing faster economic growth.

The Harrod-Domar model is a direct result of extrapolating the results of short-run Keynesian research into the long-run, using Keynesian saving-investment analysis as a basis for the projection. In the model, capital is assumed to be the most important factor in economic growth. It is concerned with the possibility of long-term growth achieved by adjustments in capital supply and demand.

The core tenet of this model is that there is no inherent reason for an economy to grow at a balanced rate and that capital accumulation is critical to a country's prosperity. Higher savings allow for greater investment in capital stock, and the stock market is one of the easiest places to invest in capital stock. The model's key points are as follows:

1. The most significant determinant in achieving stable growth is investment, which fulfills a dual purpose: it provides income while also creating productive capacity.
2. Depending on income behaviour, additional capacity resulting from increased output or increased unemployment can occur as a result of investment .
3. Income behaviour can be represented in growth rates, such as X, Xw, and Xn with the same amount of increase at each of the three speeds ensuring full-time employment of labour and capital stock's full utilization.
4. These requirements, on the other hand, merely stipulate growth in a stable state.The truth of the matter is that the pace of the rate of growth will be different from that which was predicted.If the real growth rate of the economy exceeds the allowed rate of growth, the economy will experience cumulative inflation over the course of time.If true growth is less than guaranteed growth, cumulative deflation will occur in the economy.
5. Business cycles are seen as detours from a steady growth path. These alterations are not going to function indefinitely. The so-called 'full employment ceiling' serves as a top limit, while effective demand, including independent investment and consumption, is a lower limit. There is a difference in the real growth rate between these two borders.

Listed below are some of the general assumptions that underpin the Harrod-Domar models:

a. There is already an income at the level of full-time employment.

b. The government does not interfere with the economy's operation.

c. The concept is predicated on the idea of a "closed economy." In other words, trade limitations imposed by governments, as well as the challenges associated with international trade, are thrown out.

d. In the case of variable adjustment, there are no lags, which implies that economic variables such as savings and investment as well as income and spending will all,at the same time, make adjustments.

e. The marginal propensity to save (MPS) and the average propensity to save (APS) are on the same level. S/Y = APS = MPS or, if presented in a series of symbols, APS=MPS

f. The saving proclivity and the capital coefficient (also known as the capital-output ratio) is maintained at its current levels. Because the capital-output ratio is fixed, it is reasonable to belief that the law of continuous returns governs the economy.

g. Net income, investment, and savings are all characterizes in terms of what remains after depreciation has been taken into account. As a result, depreciation rates are excluded from all of these factors.

h. It is possible to compare savings and investment in both the ex-ante and ex-post senses; in other words, the two are equivalent in both their accounting and functional terms.

According to Harrod's growth model, how can an economy get around the chances of achieving stables growth in which the capital-output ratio (capital coefficient) is fixed and the saving-income ratio is also fixed?What strategies may be used to keep the growth rate constant? Or, to put it another way, what are the prerequisites for continuing to grow at a steady rate? And what factors, if any, constrain the rate of expansion of the economy? He then embraced three separate growth rate concepts: (1) The real growth rate (X); (2) The warranted growth rate (Xw); and (3) The natural growth rate (Xn).

Although Domar's growth model is remarkably similar to Harrod's, Domar was seen by Harrod as having made a seven-year-long rediscovery of his original

formulation with Domar's formulation.Domar's argument was to extend the general theory of Keynes in two ways:

1. Investing has two outcomes that are:

a. A revenue-generating effect;

b. Capacity creation has a productivity benefit.

It should be highlighted that Keynes' short-run approach neglected the second outcome.

2. While unemployment in the labor market draws attention and inspires pity from the public, unemployment in the capital market receives little attention. It is indeed important to remember that capital unemployment prevents investment and, as a result, lowers income. As a result of the reduction in income, there is a shortfall in demand, and hence unemployment ignores the core cause of the problem in economic growth.

The model's input in this study is that if savings are absorbed into investments, which the stock market presents a veritable avenue, there will be improvements in capital formation, as illustrated in Figure 1, which is the popular business cycle's baseline

The Harrod-Domar model highlights the importance of investment in the economic growth process, implying that household savings (for example) could be invested in the stock market, resulting in capital accumulation and thus economic expansion.

2.1.2 Financial intermediation theory

Firms and people borrow money from the portion of the financial sector called the stock market lasting for an extended period of time. These businesses and persons are divided into (a) units with a desire to spend more than they earn known as "deficit units" and (b) units with a current income that exceeds their current expenditure being referred to as "surplus units".It is possible to finance a project in two ways: directly (by issuing and selling assets such as bonds and shares) or through an intermediary (by borrowing money from others by dealing through financial intermediaries).

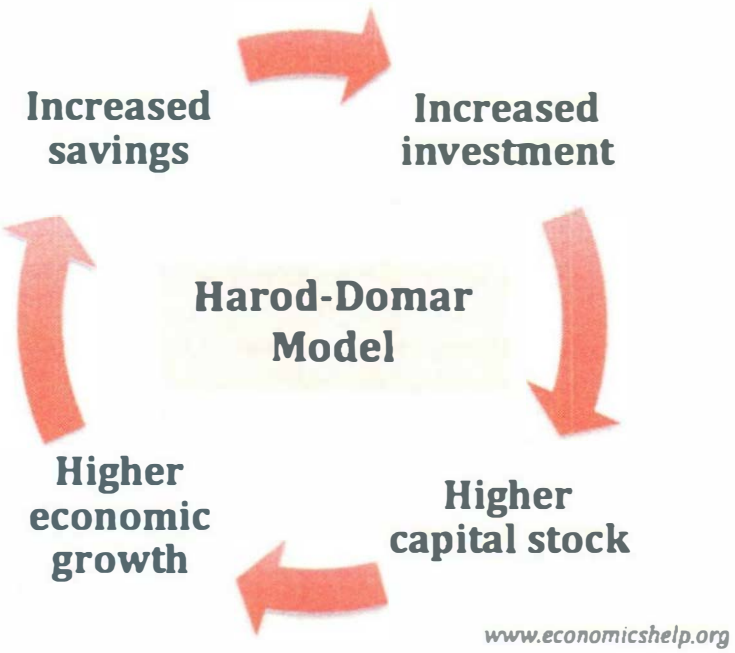

FIGURE 1: The Harrod-Domar model

Source: Pettinger (2017)

any situation adopted by an intermediary, which Fama (1981) states that it hampers intermediation from creating value.

According to empirical studies on relationships between economic and financial developmrnt, historical development and path-dependency appear to take an important part in the creation of financial institutions added with the design of financial marketplaces. Additionally, idiosyncratic shocks that jolt institutions and marketsplay a significant role in developing new business lines and innovations. The links between political, legal, economic and financial institutions are obvious, but long-term causal ties can be difficult to prove and seem depending on the methods used to analyze them.We must also keep in mind that efficient financial intermediation is characterized by the following major advantages: enhancing investment and savings and the efficiency with which financial funds are allocated. Adverse selection, transaction costs, and money regulation are all concepts of financial intermediation.

2.1.3 Portfolio management theory

A portfolio is a collection of financial securities such as stocks, debentures, government bonds, and other assets with varying risk-return characteristics. A portfolio is a grouping of assets, which might be physical or financial (Mbat, 2001). Portfolio management, according to Lipsey and Crystal (2007), is the combination of assets on the stock market that are carefully selected, acquired, and monitored in order to ensure that the securities accomplish their investment objectives over a set holding period and that the economy's productive capacity are increased by raising their values over time.

In a series of publications written in the late 1950s, Markowitz (1927) largely developed modern portfolio theory. Sharpe (1974), Linter (1962), Tobin (1918), and others expanded and developed this theory in future decades. This theory defines a portfolio's risk and return when they are combined. One of the main goals of this theory is to find efficient asset combinations. The maximum predicted rate of return on

investment for a given degree of risk is efficiency. Most people assume that investors are hesitant to taking risks. Asset valuation and portfolio theory are closely related.The theory opines that by maintaining a balanced portfolio, the removal or spreading out of some sources of risk associated with specific assets is possible.Combination of assets will, in turn, lead to capital formation in many ways as a means of return. For an individual, a growth in liquidity for additional investment in terms of the individual's investment characteristic, and a corporation, corporate expansion, the creation of new facilities, or diversification through the holding of an appropriate combination of assets.

The benefits of an optimal portfolio cannot be overstated, as a well-diversified portfolio assures enough returns for an investor. As a result, the investor will be able to reinvest and contribute to capital formation. Returns from other asset classes, such as real estate, gold in the commodities market, or treasury notes in the money market, can be invested in the stock market, fostering successful capital formation. The investment activities of these investors will be assessed in the current investigation using stock market data.

2.2 Stock market performance and capital formation literature review

Few studies show how securities markets track the amount of created capital accumulated by individuals, organizations, and governments. The outcome of the limited studies has resulted in a lack of awareness of the stock market's role in capital generation. The literature on capital formation through stock market performance, on the other hand, is sandwiched within several literarures onstock market and economic development or growth,which are discussed below concerning the current study's goal.

The importance of a stock market's liquidity cannot be overstated, as liquidity reflects investor mood in the market (Bernard & Austin, 2011). Investors' mood is vital to increase stock market activity since liquidity is critical for economic growth. Liquidity is critical for capital formation to meet its goals of economic expansion. On

the other hand. Stock market liquidity was discountenanced by Ogunrinola and Motilewa (2015). who claimed that it might not be an obvious avenue for increasing economic growth.

Ben Porath (1967) model of the allocation of time between work (earning) and the accumulation of human capital (learning) into a life cycle consumption, based on an uninsurable idiosyncratic worker revenue risk and model choice in the financial portfolo counteracts (or advises) near universal equity participation and a high level of choice in the financial portfolio (Arthreya *et al.*, 2015). The choice of the financial portfolio refers to a discounted amount of future cash flows (dividends and capital gains) that can be used for a business or to develop enterprise (Olweny & Kimani, 2011).

As a result of its post-independence development, the Nigerian capital market has contributed to industrial finance through money mobilization efforts (Oke & Adeusi, 2012). The relationship between financial markets, market reform, and economic growth, particularly in respect to market capitalization, total transaction value, total trading numbers, all share index and inflation was established when looking at market reforms by Oke and Adeusi (2012). These reforms will boost capital formation and support Nigeria's economic development in a variety of ways.

According to Wurgler (2000), financial markets develop due to reforms, and developed financial markets, with the stock market as a pivotal component, are associated with better capital allocation, as measured by domestic stock/credit market size and lending related to the gross domestic product. As a result, through market capitalization rate, money supply, interest rate, value traded ratio, turnover ratio, and government development stock, the link between stock market efficiency and economic growth is observed to be positive, though not significant (Osho, 2014), just as Herr (1984) substantiated the importance of capital formation to growth in the Australian

agricultural sector. Agriculture is a significant part of the economy, although few companies in this area are listed on the stock exchange.

With gross fixed capital formation to GDP (GFCF/GDP) as the dependent variable and independent variables including M2/GDP being the ratio of broad money supply to gross domestic product, national output saving to GDP (GNS/GDP), lending rate (LR), the exchange rate (EXR), inflation rate (INFR), external debt to GDP (EXTD/GDP), public equities to GDP (PEXTD/GDP), and public equities to GDP (PEXTD/GDP), Lucky and Kingsley (2016) deciphered that GFCF had a negative link with broad money supply, gross national savings, exchange rate, foreign debt, and balance of trade, while LR, INFR, PEX, GR, and OS had a positive relationship with GFCF. The variables included in Lucky & Kingsley's (2016) analyses influence stock market performance in the literature. The researchers suggested that the financial sector's operating efficiency be improved to close the savings-investment gap.

Ndidi and Shuaib (2015) revealed a substantial association between capital formation and economic growth, as capital formation directly relates to Nigerian economic growth. As a result, the stock market, which has capital formation as one of its duties, should contribute to economic growth (Osinubi, 2002; Chipaumire & Ngirande, 2014; Sabina & Oleka, 2015; Owusu, 2016). For long-term development, capital accumulation is critical. The importance of the Nigerian stock market as a vehicle for long-term development cannot be overstated because the effectiveness of current trading systems has influenced the way individuals can invest with comfort and confidence tobuy and sell stocks (Sabina & Oleka, 2015).

Capital formation and real GDP have a long-run positive association, and stock market capitalization is a component of capital formation process (Jiranyakul, 2014). Capital formation, particularly through investments in the stock market, has a favourable long-run influence on real GDP. However, legal regulation, accounting,

taxation, and supervisory systems impact stock market liquidity (Chipaumire & Ngirande, 2014).

2.2.1 Capital formation and all-share index

Odilli and Ede (2015) utilized yearly data on the market capitalization, stock value exchanged, all share indicators, average prime rates, inflation rates, domestic savings and fixed capital development, at current buyer value between 1980 and 2012 to examine the dynamic relationship between all share indexes and the formation of gross fixed capital in Nigeria. It was also observed that the Nigerian stock market's all-share index had a considerable effect on the formation of gross fixed capital.Based on their findings, they conclude that, while capital markets can have an impact on formation of gross fixed capital, the significance is yet to be discerned as a result of illiquidity in the financial markets.This outcome is compounded with the Nigerian capital market's low degree of development.

In examining the causality of capital formation through the stock market, Ali, Rehman, and Nasir (2016) looked at market capitalization as a major component of the Saudi Arabian stock market index in terms of economic growth. Their research looked at capital formation in a trivariate system from 1985 to 2012, using unit root tests and Johansen cointegration to look for cointegration between the variables under investigation. To ascertain the causal relationship between the variables, they employed Granger causality test.Using a vector autoregressive model, they were able to demonstrate a link between economic growth and stock market capitalization.The Granger causality tests in Ali *et al* (2016) study suggest that stock market capitalisation and capital development in the Kingdom of Saudi Arabia cause economic growth. It was established that capital production in the economy is caused by stock market capitalisation. The findings suggested that further development of the Saudi stock market is expected to contribute significantly to the confirmation of the economy's rate of growth.

According to Adeleye (2018), the capital market was formed to primarily route long-term investible money through an intermediation process for funding long-term strategic initiatives with the development of an economy in mind. This primary reason is that the lack of an efficient stock market deprives the economy of long-term finances, impeding long-term growth and development. The report recommends that the government adopt measures to improve and develop the capital market for the industrial sector to have access to long-term investment money and a tougher regulatory framework for the capital market to control its murky activities. It was also suggested that some of the severe conditions for the viability of Small and Medium Enterprises (SME's) attempting to list on the stock exchange be reduced.

Hall (2001) used data from U.S. farm, non-financial firms over 50 years to investigate the stock market in the United States and capital accumulation, focusing on the combined value of equity and debt. According to Hall's (2001) research, the securities markets reflect the amount of created capital amassed by firms. The value of a company's securities represents the worth of its producing assets. The value of the securities assesses the worth of the capital if the assets consist of capital products and are not a permanent monopolistic franchise (Hall, 2001). The quantity of the firm's capital is the value divided by the price if the capital price can be measured or inferred. The price of installed capital can be estimated using a typical model of adjustment costs. According to the data, firms have created huge amounts of intangible capital, with the means for increasing capital coming from the current capital's output. According to Hall's research, an endogenous growth model may explain the fundamental facts about corporate performance, including a significant but not improbable increase in capital productivity in the 1990s.

From 1980 to 2011, Ngerebo-A and Torbira (2014) investigated the amount and relationship direction in Nigeria between capital market performance metrics and gross

fixed capital formation.It was put forward by the researchers in the study that the purpose of the investigation was to determine which variables predict the other and their amount of influence. Their research indicated a positive and strong long-term link in Nigeria between the operations of the capital markets and the formation of gross fixed capital.A Unidirectional causation from Gross Fixed Capital Formation (GFCF) to market capitalisation according to the Granger Causality Test was deciphered. Theunidirectional causality shows an increased GFCF might increase the value of publicly traded securities, improve the worth of the enterprises, and enhance the capital market in terms of its magnitude in the country.Following the study's conclusions, it was discovered that there is no causal association between capital market activity and Gross Fixed Capital Formation. This could be a result of the capital market's low stage of development. Their study went on to say that the Nigerian economy's managers should devise policies and action plans to encourage both individuals and institutional investors to become more active participants in the capital market, to expand productive enterprises, and to foster a more private sector-driven economy in order to develop and grow the capital market.

Igbinosa and Obayagbona (2015) investigated the influence of investing in stocks has an impact on capital formation and expansion.Their main goal was to find a link between gross fixed capital formation and other independent variables that influence capital formation, such as market capitalization, new instrument issuance, stock market development, GDP, and the industrial output index. The findings revealed that gross fixed capital creation, gross domestic product, stock market development, and the industrial production index had a positive and substantial association. The inverse relationship between gross fixed capital formation and market capitalization, on the other hand, has demonstrated that, over the many years of its existence, the Nigerian stock market has only made a marginal contribution to the country's longer-

term capital formation (as measured by market capitalization). Their research concluded with a set of recommendations for how stock market authorities and policymakers may improve the Nigerian stock market's efficacy and efficiency in terms of long-term capital formation and real-sector finance geared toward economic expansion.

Popoola, Philip, and Ademola (2017) with the help of the Augmented Dickey Fuller unit root testing, Ordinary Least Squares, Johansen Cointegration tests, and Pairwise Granger causality methods, the short- and long-run effects, as well as the causal link between the Nigerian stock market and economic growth, were explored.. They discovered that the all-share index exhibited a considerable, albeit inverse, association with economic growth.

2.2.2 Number of quoted companies and capital formation

The stock market's role in the growth process can be significant (Jiranyakul, 2014). Strong liquidity stock markets could enable listed corporations to get more capital stocks than bank finance. However, this is still a contentious matter. In Jiranyakul (2014), Arestis *et al.* (2001) find evidence of a greater impact on economic growth as a result of the development of banking than the development of the stock market.On the other hand, a well-developed stock market, according to Caporale et. al. (2004), helps to accelerate capital accumulation while also improving resource allocation over the long run.

According to Odife (2000), the stock market's role in economic growth should place a significant premium on the role of entrepreneurs, serves not only as an indicator of performance, but also as a barometer of economic condition and a platform for mobilizing large numbers of people and resources for development, based on King and Levine (1993). Furthermore, persistent economic development stems from a nexus involving entrepreneurship, intangible capital investment, and financial intermediation.

consolidation programs, to see if the Nigerian capital market expansion has a substantial impact on the country's industrial and economic growth and development. The relationship between the gross domestic product (GDP) and market capitalization, the manufacturing index, new issues, market access to funds, trading values, and other variables were investigated. It was concluded that a good association seen between capital market and the industrial sector.

Odife (2000) summarizes the relationship between stock exchanges and capital formation by stating that stock exchanges are expected to work in the national interest and exist as a tool for conducting business and sharing corporate risks. The stock exchange assists joint-stock companies in refinancing and sustaining their operations by removing the requirement for them to be disbanded after a single venture, no matter how successful or disastrous. Odife (2000) observes that African stock markets have trailed behind those in other world regions because Sub-Saharan Africa lacks industries whose securities would be exchanged by rich potential brokers, as in the United Kingdom or the United States.

2.2.3 New stock issue, market turnover ratio and capital formation

A company exists to produce intellectual property. Patents, copyrights, and trade secrets all protect this property differently (Hall, 2001). The property will earn rents and may be worth more than buying during the protected period. Adopting other investors to broaden the firm's business scope frequently necessitatesa portion of the firm to be sold off to interested investors for a fee. This price allows for the purchase of physical capital. An already quoted firm will issue new shares to expand commercial frontiers in a public offer. In contrast, an unquoted firm in the process of being integrated into the stock market will issue new shares in the form of an initial public offering (IPO). Both are referred to as new stock issues.

If one looks at the data from 1982 to 2011, Briggs (2015) found that the market capitalization (MCAP), total new issues (TNI), value of transactions (VLT), and total listed equities and government stocks (LEGS) were the independent factors, and GDP was the dependent variable for economic growth.The capital market and economic growth in Nigeria were discovered to be cointegrated using Johansen cointegration and Granger causality tests, and all independent variables, including total new issues, were favourably and strongly related to the economy expansion.

Rosov (2018) assessed evolving role of public and private markets on capital formation, placed the importance of public and private markets side by side and asserted that liquidity is ensured for both large and small firms, allowing for business expansion and private individuals to participate through contributions to retiree pensions, for example. According to Rosov (2018), private credit markets grew in popularity due to the financial crisis, and new stock issues emerge in venture capital funding, allowing capital accumulation (formation).

Ngerebo-A and Torbira (2014) investigated the influence of capital market operations on capital formation using the Augmented Dickey Fuller and Granger causality tests, respectively.When the amount of capital formation in an economy increases rapidly, they observed that the value of all shares listed on a stock exchange rises as a result of the increasing market value, which is a window for increasing the value of a company's value.

2.3 Empirical review

Owusu (2016) emphasised the fact that empirical studies bordering the association that existsaround the development of the stock market and the expansion of the economy in African countries particularly, West African sub-region, have been conducted but have been limited. Longstanding debate in economic theory has centered on how the stock market's development correlates with that of the economy's

development.Preceding researchesare still not able to reach a consensus in regards to their causal interaction with one another.According to some studies, fluctuations in the stock market stimulate economic growth, while others contend that they have the opposite effect.Economic growth has also been aided by stock market liquidity (the ease of transformation of assets into liquid cash at a price) over the years.The negative risks and expenditure of investment in long-term companies are lowered by stock market liquidity.Because the initial investors can simply and rapidly sell their ownership in the company on a liquid market, they do not lose access to their capital throughout the duration of the investment project.The result may be that the availability of liquid stock markets makes it easier for investors to put their money into illiquid production processes that have the potential to be profitable in the long run, thus increasing capital allocation and enhancing long-term growth prospects (McKinnon, 1973; Bencivenga, 1996; Smith, 1997; Levine, 1997; Yartey & Adjasi, 2007; Yu, Hassan & Sanchez 2012; Ovat, 2012; Biendy, 2012).

Using data from 1980 to 2012, Ogunrinola and Motilewa (2015) investigated the relationship between stock market liquidity and economic development in Nigeria.After doing a data analysis, they determined that variables were stationary at their initial difference utilizing the Augmented Dickey-Fuller method and applying the ordinary least square (OLS) technique to estimate the fundamental model stated for their investigation.The cointegration approach established by Johansen, on the other hand, proved the presence of a cointegrating connection at the 5% level of statistical significance. Contrary to expectations, according to the findings of the study, the liquidity of the stock market did not have a statistically significant role in explaining economic development in Nigeria throughout the time under consideration. However, this discovery contradicted Owusu's (2016) findings.

Ali *et al.* (2016) from 1985 to 2012, a trivariate approach was used to examine the link between Saudi Arabia's stock market capitalisation and economic development, including capital formation. They utilized unit root tests and Johansen cointegration to evaluate whether or not there was cointegration existing in their considered variable.In their study, Granger causality test findings showed that stock market capitalisation and capital formation in Saudi Arabia impact economic development. Furthermore, capital production in the economy is influenced by stock market capitalisation. Their research findings concluded that further development of the Saudi stock market would go a long way in substantiating the economy's growth rate.

The stock market's involvement in accomplishing Vision 2020 was investigated by Abiola and Okodua (2008). Their research has emphasised the unique functions of main capital market indicators relevant to testing the capital market-economic growth nexus by using cointegration and the application of error correction modeling to time-series data on stock market performance and per capita income is discussed.The outcomes of their investigation revealed that the primary and secondary capital markets played separate roles in the development of the Nigerian economy. However, it was determined that, unlike operations in the secondary capital market, which tend to increase the Nigerian economy through the wealth effect, activity in the primary capital market. for whatever reason, did not boost the Nigerian economy.

Machuki (2016) examined stock market factors such as stock market capitalization (MC), stock sales ratio, stock traded (TVL), the number of listed stocks (LS) and the Gross Domestic Product (GDP) stock markets index (MI) were the proxy for Kenya's economic growth. It is worth noting that research on African stock markets shows them to be small and hampered by factors such as stock market illiquidity. According to these studies, countries with well-established financial markets have higher per capita income than less developed markets. According to the researcher,

several theories support the assumption that financial markets (stock markets specifically) significantly stimulate economic growth by providing long-term finance for projects and risk diversification. He (Machuki, 2016) claims that the Nairobi Stock Exchange has made headway in some of the variables thought to boost stock market performance, resulting in a rise in the listings of firms on the market and establishing rules targeted at enhamcing the stock market's overall performance.New capital production processes will be generated due to the development of the stock market.

The importance of capital development in the Thai economy was investigated by Jiranyakul (2014). The purpose was to unveil driving elements that steer capital formation utilizing data from 1979 to 2012.As a result, he established that real GDP and capital creation are inextricably linked, and that capital formation has a long-term beneficial influence on real GDP. He also noted that, rather than foreign direct investment, stock market liquidity, measured by stock market capitalisation, plays an essential role in capital accumulation.

To better understand the role of stock markets in the promotion of economic growth. Ovat (2012) disaggregated stock market liquidity empirically into two categories: stock market size and stock market liquidity. He uses the Nigerian stock market as a case study to better understand this link.The unit root test, the co-integration test, and the Granger causality test, among other econometric approaches, revealed that stock market liquidity outperformed market size in terms of profitability.Despite the fact that there is a dual causality between stock market liquidity and economic growth, he concludes that the liquidity on the stock market is causally higher than the size of the market, with little or no implications. His conclusions align with several other authors (Machlup, 1940; Olweny & Kimany, 2011; Rasaki *et al.*, 2013).

The link between Foreign Private Investment (FPI), capital creation, and growth in Nigeria was investigated by Orji and Mba (2011) using the two-stage least squares (2SLS) approach of estimation.According to the findings of the study, capital creation and foreign private investment have a greater long-term influence on economic growth than their short-term impact on the economy.Because of the large magnitude of the error correction factor, there is a long-run equilibrium connection between the variables, although the rate of adjustment is minimal in both models.The findings of the two-stage least square estimates are remarkably similar to the results of the ordinary least square (OLS) estimates, showing that ordinary endogeneity was not a concern in the calculated models.A consequence of this is the absence of a connection between economic growth and the capital creation model.

The stock market's influence on per-capita income in Nigeria has also been investigated by Sule and Momoh (2009), Obubu, Konwe, Nwabenu, Omokri, and Chijioke (2016). They discovered that the stock market positively impacts per-capita income from primary and secondary markets using the cointegration technique and error correction mechanism. In contrast, a study of eleven Middle Eastern and North African nations by Naceur and Ghanzouni (2007) discovered that there was no statistically significant link between banking and stock market development and economic growth.

Odili and Ede (2015) examined the dynamic connection between the all-share index of the Nigerian stock market and gross fixed capital creation over the period 1980 to 2012. In order for the data to be examined in Nigero, the short-run dynamics and long-run connection between stocks and gross fixed capital creation were studied using the ordinary least-square (OLS) regression and error correction mechanism (ECM).The findings demonstrate that the all-share index of the Nigerian stock market has a significant influence on gross fixed capital formation. It also illustrates that, while the

stock market can influence the gross fixed capital formation, its impact has yet to be completely asxertained because of the illiquidity of the market and the low rate of development of the Nigerian stock market.A negative relationship between transaction value and gross fixed capital creation is also revealed by the researchers' findings.Essentially, this negative relationship implies that as the value of a transaction increases, gross fixed capital creation declines in both the short and long run.

There have been a number of empirical studies that have demonstrated without a reasonable doubt the critical association in the developing world concerning formation of capital and expansion rates with respect to the economy, particularly in Africa, Asia, and Latin America. These studies includethat of Hernandez-Cata (2000), Ndikumana (2000), Ben-David (1998), Collier and Gunning (1999), Ghura and Michael (1996), Khan and Reinhart (1990), In Asia for example, 27 percent ratio of gross domestic investment (GDI) to gross domestic product (GDP) in the 1990s, expanding more quickly than the rest of the world.On the other hand, the corresponding rates of 20 percent and 17 percent, respectively in Latin America and Sub-Saharan Africa according to the submissions of the aforementioned studies.Economic-specific data indicates that private capital formation has a greater and better influence on growth than government capital formation, most likely because the production of private capital is more efficient and less connected to corruption than the creation of government capital(Beddies, 1999; Uremadu, 2006; Ghura & Michael, 1996; Osaze, 2007; Ghura, 1997).

According to Ezeoha, Ogamba, and Onyuike (2009), who investigated the nature of the growth of the Nigerian stock market link with domestic private investment specifically.According to the findings of the study, the expansion of the stock market stimulates domestic private investment flows, which results in an increase in the economy's production capacity and an increase in national output growth.However, the

data show that the expansion of the Nigerian stock market has not enhanced the flow of foreign private investment (FPI). Uremadu (2006), and Yadrichukwu and Chigbu (2014) found the same connections in their studies.

By employing regression models based on ordinary least squares (OLS), Okafor and Arowoshegbe (2011) investigated the relationship between the performance of the Nigerian stock market and gross fixed capital formation in the country.Findings indicated that stock market had not financed a significant amount of gross fixed capital development in the period under consideration for Nigeria due to a high buy-hold attitude among Nigerian investors. Their findings also demonstrated a negative link between transaction value, the number of publicly traded companies, and gross fixed capital formation. This negative link means that a rise in the value of a transaction (VAT) or the number of publicly traded firms (NLC) reduces gross fixed capital formation (GFCF).

In a paper titled "Foreign Direct Investment and Capital Formation in Nigeria," Akujuobi (2008) claims that foreign direct investment significantly contributes to Nigeria's endeavors to raise capital in general.The benefits of foreign direct investment, on the other hand, are not automatic. In a study of a similar nature, Wolde-Rufael (2009) likewise asserted this position.

Adekunle and Aderemi (2012) explored Nigeria's link between domestic investment, capital development and population growth.Their analysis of capacity utilization, capital spending, bank credit, and capital formation was based on secondary data obtained from the Nigerian Central Bank (CBN).At the same period, growth and investment rates were gathered from the World Economic Information Database.Their discovery suggest that the rate of investment in Nigeria is not commensurate to improvementsin per capita GDFP increase. The curve estimation regression models paper test indicates that growth exists, but it is minor. As demonstrated by the linear

outcome, government spending, capacity utilization, and bank credit all have a role in increasing Nigerians' income. Findings from the study also demonstrate that there is a negative association between population growth and capital formation.

From 1980 to 2010, Udoka and Anyingang (2014) evaluated the stock market's operational efficiency. The researchers employed ordinary least square (OLS) methodologies in their investigation.According to the findings, a strong link between the number of publicly traded companies and the growth of the Nigerian economy.

Between 1975 and 2008, Babatunde and Shuaibu (2011) investigated whether there was a substantial relationship between the money supply, the capital stock, inflation, and economic growth over the long run. Babatunde and Shuaibu (2011) used of an error correcting mechanism in the limits testing technique to cointegration within an autoregressive distributed framework in Nigeria led to the discovery of a positive and statistically significant relationship between money supply and capital stock.

Odilli and Ede (2015) explored the dynamic link between the all-share index of the Nigerian stock exchange and gross fixed capital creation. They proved that a relationship existed between the dependent and independent variables using the Harrod-Domar model and descriptive statistics, ADF unit root test, Johanssen cointegration, and Error Correction Model (ECM) with GFCF as dependent variable and MCAP, VST, ASI, AVPLR, INFR, MS as independent variables.

Noting Mckinnon's objection to the perfect capital-money substitution relationship in emerging countries with immature and inefficient financial markets, Tareef and Shawaqfeh (2019) investigated a variety of factors that influence capital formation in numerous Arab mations. They found that Mckinnon's predictions will lead to investors relying on self-financing as savings will be scarce. The study indicated that increasing money supply improves capital stock, using the generalized least squares (GLS) method and accounting for fixed and random influences. It was found

that increased money supply enhances capital stock, whether for individuals seeking self-financing, who may or may not invest in the stock market, or for the government, whether for capital or recurrent expenditure.

Based on the efficient market hypothesis (EMH), capital market theory and the capital assets pricing model (CAPM), Rasaki et. al. (2013) evaluated the impact on the Nigerian economy of capital market from the period 1980 to 2008.In their research, the link between the capital market and economic growth was identified by utilizing descriptive statistics, regression and correlation analyses to show the capital market trajectory through time (with GDP as a proxy).The researchers preferred independent variables: market capitalization, public capital expenditure, economic openness, the total value of domestic shares traded, foreign direct investment, and gross fixed capital creation. The researchers hypothesized that the capital market development and economic growth had a favorable connection evaluated by the capital market development indicators.They discovered a positive connection between the creation of gross fixed capital and economic growth in Nigeria, suggesting an ongoing effort to increase productivity in the national public and private sectors.

Krkoska (2001) examined the relationship between GFCF and FDI in 25 transition countries, using as dependent variables domestic credit, retained earnings, state subsidies, capital market financing, foreign credit, privatization revenues, real interest rate, and stock market liquidity, and as independent variables, domestic credit, retained earnings, state subsidies, capital market financing, foreign credit, privatization revenues, real interest rate, and stock market liquidity. The primary findings in Krkoska's (2001) study identified foreign direct investment, domestic credits, and local capital as the most important sources of capital formation, using Zellner's Seemingly Unrelated Regression (SUR), which is a system of two simultaneous equations as part of the technique. The research recommended that state subsidies be reduced because

they cannot stimulate domestic investment, improve capital market regulation, and implement continuous banking sector reforms.

Owolabi and Ajayi (2013) used econometric research in a neoclassical growth model to investigate the impact of Nigeria's capital market on economic growth. According to the findings, there is a favourable association between stock market development and economic growth. According to Owolabi and Ajayi (2013), the focus of policy should be on measures to boost stock market growth, as this will improve capital formation. Policy measures to boost the stock market's growth is true since the stock market is vital for attracting investment and capital mobility (Khalikov, 2016). It introduces capital to pivotal industries and brings international best practices, assuring a pool of investments that are catalysts for a developing economy.

Ogunleye and Adeyemi (2015) note positive relationships between indices of the stock market and money supply in Nigeria, leading to economic growth (capital formation underlying this), while Shihab (2014) used the least-squares method and the equilibrium model to assess the role of financial institutions in generating capital formation in Jordan from 1978 to 2001. The impact of these institutions on Jordan's investment levels has been established.

Several researchers, including Abanewe and Ndugbu (2012), assessed monetary policy changes and its influence on Nigerian stocks' prices. A modest relationship was discovered between inflation on stock prices (as measured by the all-share index) and monetary policy variables such as the minimum rediscount rate, treasury bill rate, short-term interest rate, exchange rate, and consumer price index, according to the researchers (CPI). Conclusion: Monetary policy has had little impact on the pricing of ordinary stocks in Nigeria, as evidenced by the fact that the stock market does not absorb monetary policy impulses well. Capital formation is hampered as a result of this.

Alenoghena (2014) examined the contributions of capital market and financial deepening to Nigerian economic growth from 1981 to 2012 by examining the stochastic features of each time series variable with the Augmented Dickey Fuller (ADF) test and estimating the error correction model. Financial development and monetization ratio (MTR) were not significant in predicting the country's economic growth trend when numerous variables were used, including market capitalisation, restricted money diversification, private-sector credit, and interest rates. However, studies have found a variety of correlations between macroeconomic variables such as money supply and capital market expansionthat have influenced capital formation in a variety of ways (Iqbal, Ahmad & Hussain, 2012; Kvietkauskiene & Plakys, 2017; Adekunle *et al*., 2016; Sirucek, 2012; Schreft & Smith, 1994; Machlup, 1940).

Country performance in capital formation and mobilization for development vary, but domestic savings and foreign capital influx are the most important factors to take into account. As a result, according to Udoka and Anyingang (2014), the stock market should be transformed into an institution that facilitates the transfer of capital from the surplus to the deficit economies.

2.4 Conceptual framework

In the 1930s and 1940s, American economist Kuznets (1955, 1973) pioneered the notion of capital formation. Economists feel that capital production is a critical indicator of a country's genuine financial health. Capital formation is required for a nation's physical capital stock to increase due tosocial and economic infrastructure investments. The stock market is a long-term financial market that provides corporations and governments with the help of fixed and working capital, as well as medium and long-term debt Gross fixed capital formation (GFCF) is made up of both gross domestic private investment and gross domestic state investment in the domestic

economy.An increase in gross fixed capital formation in a country leads to the creation of both physical and intangible goods.

The study's premise is based on the Harrod-Domar model's postulates, which emphasize investments as a key to economic growth and that greater investment leads to more growth. Because Nigeria is a developing country with an emerging economy, numerous schools of thought argue that the need to accelerate the economy's growth through the stock market should be encouraged; thus, the study's theoretical foundation is integrated into this notion. The research objectives, posed questions, and hypotheses should all contribute to solving the study's difficulties. Because of this, macro and microeconomic actions should result in the creation of capital through the stock exchange.

New issuance of stocks, the number of firms quoted on the Exchange, all-share index, market turnover ratio, and others, such as volume of transaction, the value of transaction, and market capitalization rate, are all important indicators of a stock market's performance. Because the stock market in Nigeria is so open, it is influenced by domestic investors and monetary authorities' decisions on money supply and lending rates.

The stock market in Nigeria is a source of capital formation. It is a way for surplus investors to put their money to work by investing it, leading to new jobs. It has been defined as a forum through which surplus economic units make long-term money accessible to deficit economic units in order to reduce or eliminate their financial difficulties.It should be noted, however, that not all deficit units have access to the stock market; this is done in order to safeguard surplus units (lenders) from taking on undue risk. The stock market provides a mechanism that allows people and corporations to stimulate domestic savings by providing supplementary financial instruments that can fulfil risk preferences and liquidity needs.

The decisions of investors, individuals, and boards of directors following the corporate governance framework are intertwined to the point where funds brought into a publiclytraded company in the form of new issues for business expansion can create jobs and lead to the creation or development of new infrastructures and facilities, which is one of the endpoints of capital formation. Additionally, monies will be transferred to private individuals when the firm's actions are favourable or profitable. Such transferred funds can be used to start a business or to reinvest to spread capital around.

The research investigates the relationship between important market performance indicators and capital formation variable of gross fixed capital formation, ranging from firms raising capital through the stock market to market participants selling and buying stocks and the natural activities of a firm as a going concern. In Figure 2, the conceptual framework for this investigation is provisionally depicted.

2.5 Summaryof literature and study gap

Various theories observed in previous studies concerning the stock market and its performance are based on growth models with little emphasis on stock market performance and capital formation but more on economic growth. As noted earlier in this study, the focus on economic growth is a broad spectrum in evaluating the relationships that exist around the stock market. The current research is based on the Harrod-Domar model, which emphasizes the importance of investment (capital formation's fulcrum, which is usually provided by the stock market) when it comes to the process of econpmic expansionThe foundation of this research is built on the analysis of important stock market performance indicators.

Several methodologies have been used in studies related to the current research; however, descriptive statistics, the Augmented Dickey-Fuller (ADF) unit root test and the Autoregressive Distributive Lag (ARDL) techniques are used in this study to achieve the study's objective, as has been done in previous studies.

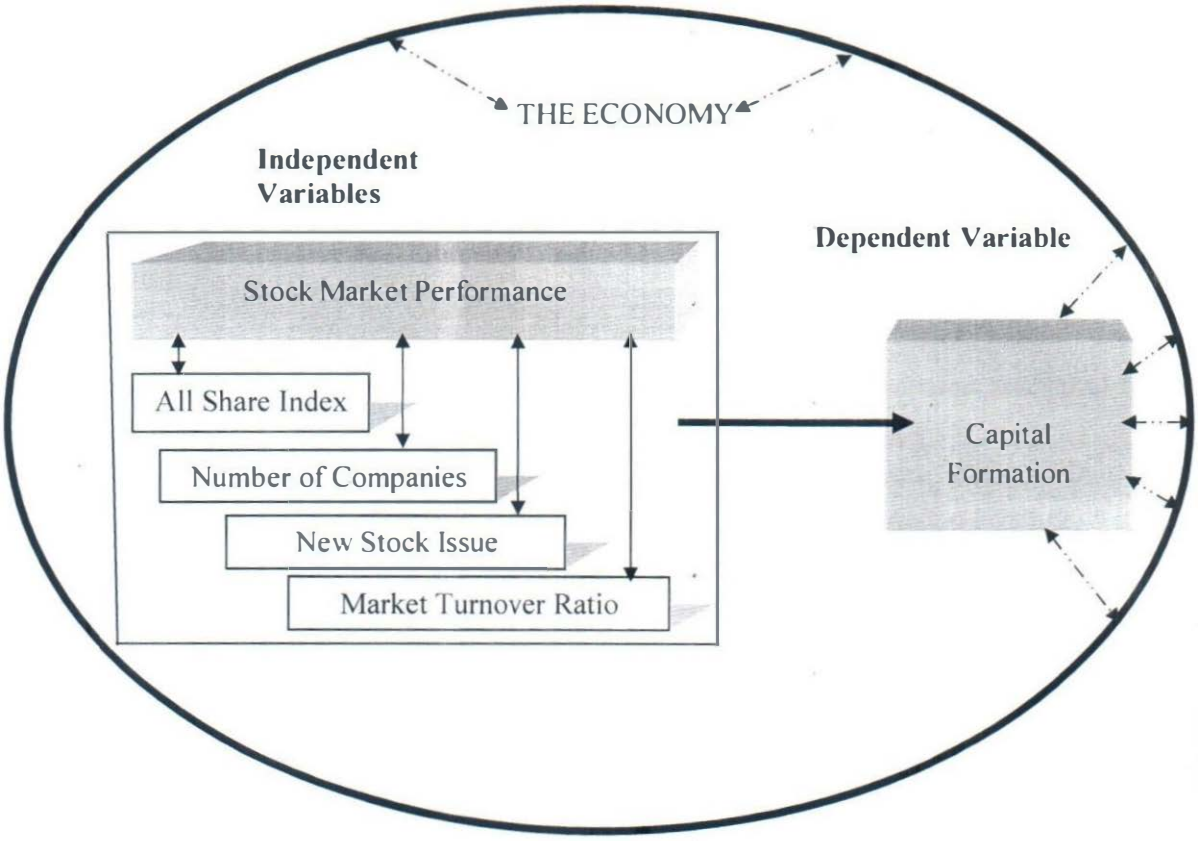

FIGURE 2: Conceptual framework of the impact of stock market performance on capital formation

Source: Author (2021)

In addition, for pre-tests, testing, and post-tests procedures, the study will use the variance inflation factor (VIF), test for heteroscedasticity, Breusch-Godfrey serial correlation LM test, CUSUM stability test, and Ramsey's regression equation specification error test (RESET). Theseprocedures allow for more reliable results.

The variables used in the linked literature to this study are mostly a mix of endogenous and exogenous stock market variables. Nonetheless, the current research adjusts fundamental aspects of the stock market's existence to achieve certain goal(s).

While there has been a wealth of literature on the stock market as a barometer of economic growth and its contributions to economic growth, the current study aims to analyze the relationship between stock market performance and capital formation. This focus is based on the assumption that capital production, which is one of the least studied functions of the stock market and, therefore the study's gap, contributes to economic growth and development. The current study incorporates various characteristics linked to stock market performance in Nigeria and the economy in one way or another to achieve the study's aims.

Furthermore, the few studies that have looked at the subjects of this study, and even those that have looked at the stock market and economic growth, have focused on gross fixed capital formation without looking at the future effect of core stock market performance variables on actual capital formation, which is another gap that this study aims to fill. This gap is particularly relevant today, given recent governments' business zeal and the ostensibly capitalist basis of the Nigerian economy.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Research design

The study used an ex post facto research methodology, also known as a secondary research design, for its investigation.Because the subject matter under examination has already occurred, this design is utilized, data is also available, and it will entail a time-based assessment of relationships. As a result, data manipulation or control cannot be used to mitigate biases. This design is also used since the studylooks into the cause-and-effect relationship between more than two variables. For the descriptive methodology, simple tables, graphs, percentages, and correlation analysis are used as statistical tools. This methodology allowed fast trends and variable characteristics to determine the association levelbefore the larger analysis.

The autoregressive distributive lag (ARDL) and the impulse response function (IRF) are used in the study's analytical technique to analyze the data generated. Several data augmentation approaches, such as the Augmented Dickey-Fuller (ADF) unit root tests, the Variance Inflation Factor, and heteroscedasticity, are applied before applying ARDL and IRF.

3.2 Nature and sources of data

In terms of data, academic study is either quantitative or qualitative. Qualitative data is descriptive, whereas quantitative data is numerical. As a result of these, two types of data sources stand out: primary and secondary data. Primary data sources are associated with research that is largely qualitative and descriptive, whereas secondary data sources are associated with studies that are quantitative and numerical. Primary data comes from questionnaires, personal interviews, and observation, among other sources, whereas secondary data comes from textbooks, journal articles, newspapers, statistics bulletins, annual reports, and financial statements. All of the data used in this

study was obtained from several issues of the Central Bank of Nigeria (CBN) statistics bulletin, as well as the Nigerian Stock Exchange (NSE) factbook, which was used as a secondary data source.Specifically, as mentioned in the scope of research in chapter one, the data for analysis in order to fulfill the study's goal will be collected on a yearly basis from 1980 to 2018, with the year 1980 as the starting point.

3.3 Method of data collection

Data were collected for this study using the desk survey technique, allowing relevant information to be retrieved from relevant published materials, papers, and journals from libraries and the internet. The data is summarized and collated following the study's objectives and assumptions for ease of reference and future analysis. The data acquired within the study's scope are dependent and independent variables, respectively, on factors specified in the body of literature.

3.4 Model specification

A multivariate econometric model is given in light of the previous sections and the theoretical framework, particularly that of the Harrod-Domar growth theory determined in addition to the study's premise. The general form in a simple linear equation is adapted and modified from the works of Ngerebo-A. & Tobira (2014) and Odilli & Ede (2013).

$$Y = a + bx + ... + Ut \quad (1)$$

The dependent variable, equation's constant, coefficient of the independent variable, independent variable, and error term are all represented as Y, a, b, x, Ut, respectively.

Variables were empirically altered with the study's goal in mind, and the mathematical structure of the relationship is described thus:

$$GFCF = f(ASI) \quad (2)$$

$$GFCF = f(NoC) \quad (3)$$

$GFCF = f(NSI)$ (4)

$GFCF = f(ASI, NoC, NSI, MTR)$ (5)

GFCF stands for the amount of gross fixed capital formation;

The All Share Index (ASI) is a stock market index that keeps track of publicly traded companies;

The number of firms that are publicly traded on the market is referred to as thenumber of companies represented by NoC;

New Stocks Issue (NSI) is a term that refers to a new stock issue;

The MTR stands for Market Turnover Ratio.

These variables were adopted from the underlying theory and earlier empirical studies focusing on the stock market's impact on economic growth and capital formation. The inclusion of variables that affect market performance (NoC and NSI) to enable the deciphering of whether stock market performance affects capital formation in Nigeria or not is one of the modifications of the asymptotic model used by Jiranyakul (2014), Ngerebo-A and Torbira (2014), and Odili and Ede (2015).

The following are the econometric forms derived from equations 2 to 5:

$GFCF = \beta_o + \beta_1 ASI_t + U_t$ (6)

$GFCF = \beta_o + \beta_2 NoC_t + U_t$ (7)

$GFCF = \beta_o + \beta_3 NSI_t + U_t$ (8)

$GFCF = \beta_o + \beta_1 ASI_t + \beta_2 NoC_t + \beta_3 NSI_t + \beta_4 MTR_t + U_t$ (9)

Where β_i denotes parameters, Ut denotes the error term, and the rest of the variables are defined after equation 1.

Through the transformationof equations 6 to 9 into a log-linear form, re-specification of the equation is as follows:

$LGFCF = \beta_o + \beta_1 LASI_t + U_t$ (10)

$$LGFCF = \beta_o + \beta_2 LNoC_t + U_t \quad (11)$$

$$LGFCF = \beta_o + \beta_3 LNSI_t + U_t \quad (12)$$

$$LGFCF = \beta_o + \beta_1 LASI_t + \beta_2 LNoC_t + \beta_3 LNSI_t + \beta_4 LMTR_t + U_t \quad (13)$$

The logarithm is denoted by the letter 'L.'

The examination will be guided by economic theory and will look to see if the estimates match expectations. The signs at the end of the analysis will determine this. In a nutshell, all share index, number of firms, new stock issues, and market turnover ratio are projected to have some sort of favourable effect on capital creation, specifically gross fixed capital formation (GFCF). According to economic apriori, the independent variables are predicted to have some influence and, or relationship on the dependent variable of GFCF.

3.5 Techniques of data analysis

Pre-test procedures such as the Augmented Dickey Fuller (ADF) unit root test, the variance inflation factor (VIF), and the test for heteroscedasticity are used to give empirical evidence for examining the relationship between stock market performance and capital formation. The ADF unit root test eliminates the possibility of erroneous results by ensuring the stationarity of the data used in the study. The ADF model is as follows:

$$\Delta y_t = \alpha + \beta t + \Upsilon y_{t-1} + \delta_1 \Delta y_{t-1} + \ldots + \delta_{p-1} \Delta y_{t-p+1} + \epsilon_t \quad (14)$$

When the predictor variables are not linearly linked, the VIF measures how inflated the variance of the predicted regression coefficients is. It is a term that describes how much multicollinearity (correlation between predictors) there is in a regression study. Multicollinearity is undesirable since it raises the variance of regression coefficients. Varying from one to 10, the inflation factors are used to calculate the variation between and among variables in an equation. In decimal form,

the numerical value for VIF reveals what percentage of the variance (the standard error squared) is inflated for each of the coefficients in the equation.VIF has a numerical value that is stated as follows:

$$Y = \beta_o + \beta_1 X_1 + \beta_2 X_2 + ... + \beta_k X_k + \epsilon \quad (15)$$

Where the estimate's standard error is β_j, which is the square root of the j + 1 diagonal element of $S^2(X^1X)^{-1}$.

For this study, a rule of thumb will be used based on:

If the VIF is less than or equal to 1, it shows that there is no correlation between the variables.

A VIF ranging from 1 to 5 implies that the variables are only moderately related to one another.

Data that has a VIF greater than 5 implies that the data is highly connected together.

A test called the Breusch–Pagan test, developed by Breusch and Pagan (1979), assesses whether or not heteroscedasticity exists in a linear regression model by examining the variance of regression errors in relation to the values of the dependent variables.If this is the case, heteroscedasticity is discovered. One of the key requirements of linear regression is that the residuals should not be heteroscedastic. In layman's words, this indicates that the variance of residuals should not grow as the response variable's fitted values increase. Once a linear regression model is established, It is usual practice to examine the residuals for signs of heteroscedasticity. The purpose is to see if the model can describe a pattern in the response variable's distribution (dependent variable). It may or may not appear in the residuals.An inefficient and unstable regression model would develop as a result of this trend, which could eventually produce erroneous outcomes.In actuality, the Breusch–Pagan test, which is often known as the Chi-squared test, was founded on this principle.If the test statistic has a p-value less than a certain threshold ($p<0.05$), the null hypothesis of

homoscedasticity is rejected, and the alternative hypothesis of heteroscedasticity is accepted.

3.5.1 Techniques for estimation

Several estimation methodologies, including the impulse response functions and the autoregressive distributed lag (ARDL) test, have been developed over the years by researchers such as Pesaran and Pesaran (1997) as well as Pesaran and Shin (1999) and Shin and Smith (2001), and are used in this study. The ARDL's goal is to look at the long and short term links between variables, in this case, stock market performance and capital formation in Nigeria.

Because it may be employed independently of the integration sequence of the variables under consideration or whether the variables are mutually cointegrated, the ARDL offers benefits over other co-integration methods in this investigation (Pesaran & Pesaran, 1997; Pesaran & Shin, 1999; and Shin and Smith, 2001).

Based on equations (10 - 13), the ARDL model used for this study was constructed and it runs like this:

$$\Delta GFCF = \alpha_o + \beta_1 LASI_t + \beta_2 LNoC_t + \beta_3 LNSI_t + \beta_4 LMTR_t + U_t \quad (16)$$

For the purpose of observing the long-run relationship between the variables in the model, the F-statistics are utilized.As a consequence, the null hypothesis for the purposes of this analysis is:

Ho: $\rho 1 = \rho 2 = \rho 3 = \rho 4 = 0$.

The critical values calculated by Pesaran on the Pesaran Critical values table are compared with F-statistics to determine if the null hypothesis should be rejected or accepted.The decision rule are as follows:

1. No co-integration exists when the F-statistics is smaller than the Pesaran determined lower bound I(0).

2. If the F-statistics is greater than the lowest bound I(1) obtained by Pesaran, then there is co-integration between them.
3. When the F statistic value is between the limits of I(0) and I(1), the result is inconclusive.

Furthermore, during the time period under consideration, the impulse response function illustrates the reaction of the dependent variable to a one standard deviation shock in itself as well as the response of the dependent variable to the other independent variables in the estimated model. For ten years, the Cholesky one standard deviation innovation will analyze the impulse response functions.

3.5.2 Validation of the model

Validation of time series data is required to smooth the model and perform an error-free analysis. The following tests will be used to achieve this:

1. The serial correlation LM test devised by Breusch and Godfrey;
2. Stability test with CUSUM
3. Ramsey regression equation specification error test (RESET)

The ARDL F-bound test is used to determine whether there is a long-run relationship between stock market performance and net capital formation (Pesaran et. al., 2001). This test aims to estimate the ARDL model using the chosen optimum lag length selection criterion.

As a preliminary stage, the study will utilize ARDL order selection criteria to determine the suitable lag length criterion of the variables before computing the long-run connection between the subjects matter in the experiment as described above.

3.5.3 ARDL Wald coefficient restrictions test, for hypotheses

The estimating technique used in this work is the ARDL estimation technique, as discussed earlier in this section. The following equations are used to analyze each of the four hypotheses presented in this study:

$H_{o}1$ - ASI: $C(5) + C(6) + C(7) + C(8) + C(9) = 0$ (17)

$H_{o}2$ - MTR: $C(10) + C(11) + C(12) + C(13) + C(14) = 0$ (18)

$H_{o}3$ - NSI: $C(15) + C(16) + C(17) + C(18) + C(19) = 0$ (19)

$H_{o}4$ - NoC: $C(20) + C(21) + C(22) + C(23) + C(24) = 0$ (20)

The analyses for these equations are abstracted from the comparison of the F-statistics tabulated and calculated and are included in the estimation of the ARDL model defined for this study. The results will allow the presented hypotheses to be accepted or rejected.

CHAPTER FOUR

DATA PRESENTATION, ANALYSIS AND DISCUSSION OF FINDINGS

4.1 Data presentation

In order to make informed decisions, the current chapter will evaluate and interpret data that is relevant to the research.

Most of the information came from the Central Bank of Nigeria's (CBN) Statistical Bulletin, the Nigerian Stock Exchange's (NSE) Factbook, and other published sources. The study uses 39 years (1980-2018) annual data points to focus on the most important data, one of the study's scopes.

The data generated for this studyis presented in the Table 4.1, along with their explanations in the succeeding sections. Table 4.1 shows the secondary data used in this investigation for each desired variable. As previously indicated, many characteristics observed in the data are presented in the next section.

4.2 Data analysis

4.2.1 Descriptive statistics

Statistical description of phenomenoninvolving stock market performance and capital formation in Nigeria proxies captured in this study are presented in Table 4.2 above. The purpose of descriptive statistics was to highlight the trend behaviour of the data set, as shown in Table 4.1 throughout this research. The mean values of the variables in Nigeria were N1175.743 billion for gross fixed capital creation, 59.79 for market turnover ratio, 256.30 for number of companies,.292807.6 for new stock issues, and 16075.71 for the all shares index, as shown in Table 4.2.

The variables' minimum values were N8.800 billion for gross fixed capital creation, 5.88 for market turnover ratio, 188.00 for number of companies, 159.80 for new stock issuance, and 117.28 for the Nigerian all-share index.

TABLE 4.1

Capital formation and stock market performance/data used for the study

YEAR	GFCF	ASI	NOC	NSI	MTR
1980	17.7	NA	188	479	79.32653
1981	18.2	NA	194	455.2	60.96
1982	17.1	NA	205	533.4	43
1983	13.3	NA	212	448.5	69.80702
1984	9.1	NA	213	159.8	76.03636
1985	8.8	117.28	220	817.2	48.42424
1986	11.4	149.82	240	833	72.70588
1987	15.2	176.92	244	450.7	42.43902
1988	17.6	210.81	253	400	13.76
1989	26.8	273.87	267	1629.9	40.75
1990	40.1	423.66	295	9964.5	16.28834
1991	45.2	677.62	239	1870	5.887446
1992	70.8	931.02	251	3306.3	10.04808
1993	96.9	1229.03	272	2636.9	8.469474
1994	105.6	1913.23	276	2161.7	8.59276
1995	141.9	3815.12	276	4425.6	10.19856
1996	204	5955.14	276	5858.2	24.71204
1997	242.9	7638.79	264	10875.7	39.27882
1998	242.3	5961.88	264	15018.1	51.68431
1999	231.7	5264.19	268	12038.5	46.90667
2000	331.1	6701.18	260	17207.8	59.60851
2001	327.1	10185.1	261	37198.8	87.06989
2002	499.7	11631.9	258	61284	77.66597
2003	865.9	15559.9	265	180080	88.57691
2004	863.1	24738.7	277	195418	106.897
2005	804.4	22876.7	288	552782	90.66439
2006	1,546.50	25343.6	294	707400	91.83023
2007	1,937.00	48773.3	310	1935080	81.62987
2008	2,053.00	50424.7	301	1509230	175.5875
2009	3,050.60	23091.6	266	1739349	97.53048
2010	4,012.90	24775.6	264	1925471	80.65082
2011	3,908.30	23393.7	250	1724683	62.18073
2012	3,357.40	23432.7	256	195360	54.65845
2013	3,632.90	36307.1	254	286760	123.2283
2014	3,495.10	39409.8	253	271050	79.32401
2015	3,564.00	28642.3	254	1428.25	57.52071
2016	3,529.60	26874.6	254	1902.3	38.30632
2017	5113.04	38243.2	253	1665.28	51.04347
2018	1385.4	31430.5	261	1783.79	58.66389

Sources: CBN Statistical Bulletin (2018) and NSE Factbook (2008)

The variables had maximum values of N5113.04 billion for gross fixed capital creation. 175.58 for market turnover ratio, 310.00 for number of companies, 1935080 for new stock issues, and 50424.70 for total shares issued in Nigeria.

A normal skewness value of zero indicates that the distribution is symmetric around its mean; a positive skewness value indicates a long right tail in the distribution, meaning that the skewness value is greater than the sampled mean. A negative skewed distribution has a lengthy left tail with values that are lower than the sampled mean. The assessment of skewness revealed that the number of companies was negatively skewed, suggesting that the distribution had a lengthy left tail with lower values than the sampling mean, according to the descriptive statistics analysis. Gross fixed capital formation, market turnover ratio, new stock issues, and the all-shares index, on the other hand, are correctly skewed, indicating that the series had a large right tail, hinting that the series produced a higher value than the sample mean.

Kurtosis is a metric that determines how peaky or flat the data is compared to the normal distribution. There are three types of kurtosis: mesokurtic, leptokurtic, and platykurtic. Table 4.2 shows that GFCF is almost mesokurtic (normal), MTR, NoC, and NSI are leptokurtic, and ASI is platykurtic (2.285795) indicating a flattened curve with negative kurtosis. The distribution is mesokurtic with kurtosis of 3.0000, indicating that it is typical. Leptokurtic or positive kurtosis is defined as a peaked curve that yields higher values than the normal and has a kurtosis value of more than 3.0000. A kurtosis value of less than 3.0000 is platykurtic or negative kurtosis, indicating that the curve is flat and lower than the sample mean. Variables like gross fixed capital formation and all shares index were peaked (3.00 and above) (Leptokurtic) relative to the normal distribution. In contrast, variables like market turnover ratio, number of companies, and new stock issues were flat (platykurtic or below 3.000) in relation to the normal distribution curve.

TABLE 4.2

Test of descriptive statistics

	GFCF	MTR	NOC	NSI	ASI
Mean	1175.734	59.79264	256.3077	292807.6	16075.71
Median	242.9000	58.66389	260.0000	5858.200	10908.48
Maximum	5113.040	175.5875	310.0000	1935080.	50424.70
Minimum	8.800000	5.887446	188.0000	159.8000	117.2800
Std. Dev.	1538.221	35.46542	27.37186	595210.8	15299.91
Skewness	1.083537	0.708581	-0.643074	2.022487	0.633416
Kurtosis	2.685380	4.298843	3.434961	5.458628	2.285795
Jarque-Bera	7.792196	6.004926	2.995472	36.41082	2.996185
Probability+	0.020321	0.049665	0.223636	0.000000	0.223556
Sum	45853.64	2331.913	9996.000	11419496	546574.3
Sum Sq. Dev.	89912700	47796.25	28470.31	1.35E+13	7.72E+09
Observations	39	39	39	39	34

Source: Researcher's computation using E-views 10.0 statistical software (2021)

To determine if a series has skewness and kurtosis, the Jarque-Bera (JB) test compares them to those of a normally distributed data set. The null hypothesis for JB statistics is that the series is normally distributed if JB values of 2.995 for number of companies and 2.996 for all shares index with respective p-values of 22.36 per cent and 22.35 per cent greater than 5% indicated that the null hypotheses for all variables were not rejected. As a result, the dataset had a regularly distributed distribution.

4.2.2 Augmented Dickey-Fuller (ADF) unit root test

As mentioned in Chapter three, to establish if a time series is stationary, the ADF test statistic values must be larger than the Mackinnon critical value at the one percent, five percent, and ten percent levels of significance, with a comparison done at the absolute (value) term.In Table 4.3,the results of the unit root test based on the Augmented Dickey-Fuller method are displayed (ADF). Only number of companies' variables was shown to be stationary at the level due to the tests. This outcome is because the complete values of the augmented Dickey-Fuller test statistics were larger when compared with the tabulated value at the standard 5% level of significance.

However, after performing a first difference operation on the remaining variables of interest (gross fixed capital formation, market turnover ratio, new stock issues, and all shares index), which were not stationary at level because their computed ADF test statistics values were less than the critical ADF test statistics values at a 5% level of significance, they became stationary. As a result, at the 5% significance level, the computed ADF test statistics values for all of these variables (gross fixed capital formation, market turnover ratio, new stock issues, and all shares index) were greater than the tabulated values. All variables of I(0) and I(1), depending on the circumstance are transformed as a result of integration.

TABLE 4.3

Augmented Dickey-Fuller (ADF) test

Variable	Level	p-val at levels	1st Difference	p-values at 1st Difference	Remarks
GFCF	-0.9704	0.7540	-3.6760	0.0087***	I(1)
MTR	-1.9548	0.3048	-7.1537	0.0000***	I(1)
NOC	-2.9832	0.0456***	-	-	I(0)
NSI	-1.3837	0.5800	-6.3007	0.0000***	I(1)
ASI	-2.5734	0.1085	-4.1006	0.0032***	I(1)
TEST OF CRITICAL VALUES:					
1%= -3.66155					
5%= -2.9411***					
10%= -2.6090					

Source: Researcher's computation using E-views 10.0 statistical software (2021)

4.2.3 ARDL F-bound test

Considering that the series were stationary at the following order of integration I(1) using the ADF unit root test, the autoregressive distributive lag (ARDL) model was determined to be the optimum method (technique) for capturing the short and long-run dynamics of the model in this study. With the use of an unconstrained vector error correction model, the ARDL technique to co-integration put forward by Pesaran (1997), Pesaran and Shin (1999), and Pesaran *et al.* (2001) have been utilized. When compared to other co-integration approaches, the ARDL method has a number of benefits, which include: regardless of whether the underlying variables are exclusively I(0), I(1), or mutually co-integrated, the ARDL technique can be used. Small sample attributes have been approximated more accurately by ARDL. A long-run link between stock market performance and capital formation in Nigeria is being investigated by this study employing Pesaran *et al.* (2001) who used the limits test technique of cointegration.With the help of the optimum lag length selection criterion provided in Table 4.4, the aim of the test is to estimate the ARDL model.

The Wald test (bound test) is used in conjunction with the F-test to determine the combined significance of the coefficients given in the model. The Wald test is an F-test in which the estimated long-run coefficients of determinants (ASI, MTR, NSI, NoC) and GFCF are restricted, as illustrated in Table 4.4. The ARDL bounds test tabulated lower and upper bound selection criteria are at one percent, five percent, and ten percent significance levels. The ARDL results show that the determinant coefficients (ASI, MTR, NSI, NoC) are strongly jointly co-integrated with the dependent variable, gross fixed capital formation, implying that the independent variables and dependent variable share a long-run commitment to one another.The relationship observed here is due to the fact that the estimated F-statistic is 7.17, which is larger than both the bottom and upper boundaries of the Pesaran critical value at all levels of statistical significance (3.49). This finding shows that (ASI, MTR, NSI, NoC) and GFCF had long-run co-integration.

TABLE 4.4

ARDL F-bounds test

F-Bounds Test			Null Hypothesis: No levels relationship	
Test Statistic	Value	Significance	I(0)	I(1)
			Asymptotic: n-=1000	
F-Statistic	7.178133	10%	2.2	3.09
K	4	5%	2.56	3.49
		2.5%	2.88	3.87
		1%	3.29	4.37
Actual Sample Size	30		Finite Sample: n=30	
		10%	2.525	3.56
		5%	3.058	4.223
		1%	4.28	5.84

Source: Researcher's computation using E-views 10.0 statistical software (2021)

4.2.4 ARDL cointegration and long-run test effects

EC = GFCF+1.1271*ASI + 0.6857*MTR+1.1276*NSI- 0.6771*NOC +2.2909

The unit root test order of integrations I(0) and I(1) are used in this study to confirm the potential of long-term cointegration among variables with the same or unique order of integrations. The ARDL bound test demonstrates that the variables in the model have a long-run connection, as indicated by the outcome of this test.Coefficients of the lobg-run assesses the impact of the independent factors (ASI, MTR, NSI, and NoC) on the dependent variable (GFCF) over time. Long-run coefficients must be determined using the data in Table 4.5 as a starting point.

The long-run estimates of the independent variables (ASI, MTR, NSI, NoC) have a joint substantial positive effect on capital formation in Nigeria, according to the ARDL cointegrating and long-run form is presented on Table 4.5. In the long run, an increase in these variables (ASI, MTR, NSI, NoC) will significantly influence capital formation in Nigeria. In the long run, ceteris paribus, capital formation in Nigeria will increase by 2.29 per cent due to improvements in present stock market performance metrics (all shares index, market turnover ratio, number of companies, new stock issuance).

According to the ARDL's long-term forecasts, in the long run, a 1% gain in the all shares index (ASI) will result in a 1.2941 percent increase in capital formation in Nigeria. In the long run, if the performance of the stock market's all-share index continues to improve, capital formation in Nigeria will rise considerably as a direct result, ceteris paribus.

All other things being equal, according to the ARDL long-term forecasts, a percentage increase in the market turnover ratio (MTR) will result in a 0.6857 percent increase in capital formation in Nigeria in the long run. By extension, as the stock market's market turnover ratio increases, capital formation in Nigeria will increase significantly in the long run, ceteris paribus.

TABLE 4.5

ARDL long run form and bounds test

Levels Equation

Case 2: Restricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LASI	-1.294118	0.171395	-7.550500	0.0026
LMTR	-0.685751	0.303787	-2.257341	0.0077
LNSI	-1.127682	0.510023	-2.211041	0.0433
LNOC	0.677111	0.457848	1.478899	0.1700
C	-2.290901	0.230631	-9.933187	0.0005

EC = LGFCF - (-1.2941*LASI - 0.6857*LMTR -1.1276*LNSI + 0.6771*LNOC

-2.2909)

Source: Researcher's computation using E-views 10.0 statistical software (2021)

Additionally, according to the ARDL long run forecasts, a percentage increase in new stock issues (NSI) will result in a 1.1276 per cent increase in capital creation in Nigeria over the long term.Accordingly, if the stock market continues to strengthen, the number of new stock offerings will increase, and capital formation in Nigeria will increase as a direct result, in the long run, barring any unforeseen circumstances

On the contrary, the ARDL long-run calculations found that all else being equal, growth in the number of companies (NoC) in Nigeria will not increase capital creation in the long run. By implication, as the number of companies listed on the Exchange grows, capital formation will fall in Nigeria, but only slightly, in the long run, ceteris paribus.

4.2.5 ARDL short-run dynamics and error correction test

Stemming from this study's results, the R^2 (R-square), which assesses the overall goodness of fit of the complete ARDL model, has a very high good fit. When all other factors, such as the all shares index, market turnover ratio, new stock issues, and the number of companies, are maintained in the short run, the value of the intercept, which is 6.9319, infers that capital formation in Nigeria will increase by 6.9319 per cent (Table 4.6). This is shown by the R^2 value of 0.9971 (99.71%), which is close to 100%, meaning that the independent variables (ASI, MTR, NSI, NoC) were responsible for nearly all ofthe fluctuating value of the dependent variable (GFCF).

The high F statistic value (72.67) also suggests the statistical significance of the entire model.Thus, all the explanatory variables (ASI, MTR, NSI, NoC) joint relevance in explaining the short-run variations in formation of capital in Nigeria is implied as a result of overall significance in the case of the ARDL short-run model. In other words, there is no long-run relationship in Nigeria between stock market performance and capital formaion.

TABLE 4.6

ARDL short-run dynamic outcome

Dependent variable: LGFCF

Method: ARDL

Selected model: ARDL (4, 4, 4, 4, 4)

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
LGFCF(-1)	-0.011126	0.379066	-0.029352	0.9777
LGFCF(-2)	0.474175	0.468612	1.011872	0.3580
LGFCF(-3)	1.214775	0.791331	1.535103	0.1854
LGFCF(-4)	-1.168627	0.790874	-1.477641	0.1995
LASI	1.654821	0.639175	2.588995	0.0489
LASI(-1)	-0.592382	0.419788	-1.411144	0.2173
LASI(-2)	-0.339246	0.723530	-0.468877	0.6589
LASI(-3)	-0.234865	0.600353	-0.391211	0.7118
LASI(-4)	-0.553451	0.322714	-1.714990	0.1470
LMTR	-0.032827	0.161600	-0.203138	0.8470
LMTR(-1)	0.563225	0.351594	1.601918	0.1701
LMTR(-2)	0.429706	0.381843	1.125348	0.3115
LMTR(-3)	0.416543	0.216418	1.924718	0.1122
LMTR(-4)	-0.241384	0.239698	-1.007033	0.3601
LNSI	-0.230463	0.141382	-1.630071	0.1640
LNSI(-1)	-0.052161	0.101668	-0.513056	0.6298
LNSI(-2)	-0.157844	0.077893	-2.026416	0.0986
LNSI(-3)	0.144600	0.070544	2.049786	0.0957
LNSI(-4)	0.288451	0.135422	2.130018	0.0864
LNOC	-0.092436	1.890038	-0.048907	0.9629
LNOC(-1)	0.702643	1.461604	0.480734	0.6510
LNOC(-2)	2.107758	1.533856	1.374156	0.2278
LNOC(-3)	3.478073	2.534417	1.372336	0.2283
LNOC(-4)	4.934924	2.655644	1.858278	0.1222
C	6.931916	0.917254	9.557248	0.0002
R-squared	0.997141	Mean dependent var		6.424477
Adjusted R=squared	0.983420	S.D. dependent var		1.618017
S.E. of regression	0.208342	Akaike info criterion		-0.424365
Sum squared residual	0.217032	Schwarz criterion		0.743299
Log likelihood	31.36548	Hannan-Quinn criterion		-0.050819
F-statistic	72.67024	Durbin-Watson stat.		2.519721
Prob (F-statistic)	0.000074			

*Note: p-values and any subsequent tests do not account for model selection.

Source: Researcher's computation using E-views 10.0 statistical software (2021)

According to the ARDL short-run projections, changes in the current period of the all-share index had a significant positive impact on capital formation in Nigeria in the short run, despite the fact that the index has been volatile. The positive effect implies that a percentage gain in the all-share index in the current period will result in a considerably commensurate increase in capital formation in Nigeria in the short run of 1.6586 percent. Changes in the prior lagged period of the all-share index had a minor negative impact on capital formation in Nigeria in the short run, according to the findings.A percentage increase in the all-share index over a prior lagged period will result in a 0.5923 percent reduction in capital formation in Nigeria over a short period of time, depending on the circumstances.

A minimal negative impact on Nigeria's capital formation was observed in the short run as a result of changes in the all-share index over the previous three lagged periods. When looking at capital formation in Nigeria over the short term, changes in the all-share index during the past two lagged periods had a minor negative influence on the country's capital formation.It follows from the negative effect that a one-percent increase in the all-share index over the previous and subsequent two lagged periods will result in a 0.3392 percent reduction (or increase) in capital formation in Nigeria in the short run, depending on the circumstances. The negative effect implies that a percentage gain in the all-share index over the previous three lagged periods will result in a 0.2348 percent drop in capital formation in Nigeria in the short run, as the case may be. Finally, changes in the all-share index during the preceding four lagged periods had a minor negative influence on capital formation in Nigeria in the short run.Because of this negative effect, a percentage rise in the all-share index over the preceding four lagged periods will result in a 0.5534 percent loss in capital formation for Nigeria in the short run, or vice versa, depending on the situation.

A slight negative impact on capital formation in Nigeria was observed in the short run as a result of changes in the current market turnover ratio, according to ARDL short run estimations.The negative effect suggests that a 0.0328 percent increase in the market turnover ratio at the current time will not result in a commensurate modest decline in capital formation in Nigeria in the short run. if such is the case in the current situation.Changes in the prior lagged period of the market turnover ratio had a minor positive effect on capital formation in Nigeria in the short run.Specifically, the positive effect indicates that a percentage increase in the market turnover ratio during the prior delayed period will result in a very tiny increase of 0.5632 percent in capital creation in Nigeria in the short run.

In the short run, changes in the market turnover ratio over the previous two lagged periods had a negligible beneficial effect on capital formation in Nigeria. The positive effect implies that a percentage increase in the market turnover ratio over the previous two lagged periods will result in a comparatively minor capital formation improvemcntsin the short run in Nigeria of 0.4297 percent. In the short run, changes in the market turnover ratio over the prior three lagged periods had a negligible but beneficial effect on capital formation in Nigeria. The positive effect implies that a percentage increase in the market turnover ratio over the previous three lagged periods will result in a comparatively minor growth in capital formation in the short run in Nigeria of 0.4165 percent. Finally, changes in the market turnover ratio during the four lagged periods had a minor negative impact on capital formation in Nigeria in the short run. The negative consequence is that, over the previous four lagging years, a percentage increase in the market turnover ratio will result in a short run 0.2413 percent drop in capital formation in Nigeria.

Changes in the current period of new stock offers or issues have had, according to the ARDL short run estimates, a little negative effect on capital formation in

Nigeria.The negative effect implies that a percentage rise in new stock issuance in the current time will not result in a comparable insignificant fall in capital formation in Nigeria in the short run by 0.2204 percent. In the short run, adjustments to new stock offers in the previous lagged period had minimal adverse impact on capital formation in Nigeria.The positive effect means that a drop in new capital output in the previously lagged period would lead to a short-term decline of 0.0521 percent in capital formation in Nigeria.

In the short run, modifications in the last two lagged stock issuance period have had insignificant negative effects on the formation of capital in Nigeria.This negative effect implies that a percentage rise in new stock issues in the prior two lagged periods will result in a comparable minor fall in capital formation in Nigeria in the short term of 0.1578 percent. In the near run, changes in the prior three lagged periods of new stock issuance had a negligible beneficial impact on capital formation in Nigeria. The positive effect implies that a percentage rise in new stock issuance over the previous three lagged periods will result in a comparatively minor increase in capital formation in Nigeria in the short term of 0.1446 percent. Finally, in the short run, changes in the prior four lagged periods of new stock issuance had a negligible beneficial influence on capital formation in Nigeria. The positive effect implies that a percentage rise in new stock issuance over the previous four lagged periods will result in a comparatively minor increased short-run capital formation in Nigeria by 0.2884 percent.

Further analysis of the ARDL short-run estimates shows that changes in the number of companies in the current period had a negligible negative effect in the short run on capital formation in Nigeria. The negative effect is that a percentage increase in the number of companies in this time does not result in a comparatively little decrease of 0.0924 percent in capital formation in Nigeria.A modest positive effect on capital formation was observed in Nigeria in the short run when the number of firms in the

prior lagged period of the short run.This positive effect implies that a percentage rise in the number of companies in the previous lagged period will result in a similar minor increase in capital formation in Nigeria in the short run by 0.7026 percent.

In the short run, changes in the number of enterprises in the preceding two lagged periods had a negligible positive effect on capital formation in Nigeria. The positive effect implies that a percentage rise in the number of companies in the previous two lagged periods will result in a minor proportional increase in capital creation in Nigeria in the short run of 2.1077 percent. In the short run, changes in the number of enterprises in the previous three lagged periods had a negligible positive influence on capital formation in Nigeria. The positive effect implies that a percentage rise in the number of companies in the previous three lagged periods will result in a minor proportional increase in capital creation in Nigeria in the short run of 3.4780 percent. Finally, changes in the number of enterprises in the prior four lagged periods had a negligible beneficial influence on capital formation in Nigeria in the short run. The positive effect implies that a percentage rise in the number of companies in the previous four lagged periods will result in an insignificant proportional increase in capital creation in Nigeria in the short run of 4.9349 percent.

4.2.6 ARDL error correction term (ECT)

It is necessary that the error correction term (ECT) coefficient be negative and not less than -2 (i.e., be between 0 and 2) in order for the long-run relationship between variables to be statistically significant.The ECT is the rate at which the dynamic model adjusts to reestablish balance in the short run.This ECT coefficient has a statistically significant negative sign and is used to indicate how rapidly variables reach equilibrium in the short run.

The error correction term's (ECT) predicted negative sign was extremely significant in the variables' results. In the long run, the ECT indicates how quickly our

model recovers to equilibrium in the short run after an external shock. It should be negative, suggesting a return to equilibrium; a positive sign implies a departure from equilibrium. The extremely significant ECT adds to the evidence of a long-run stable and strong connection. This evidence corroborates the existence of a strong long-runrelationship between stock market performance metrics with capital formation in Nigeria, notwithstanding the numerous latencies. All things being equal, the ECT coefficient (-0.4908) demonstrated that variation away from the short run is judged rectified by 49.08 percent by the next year. As a result, to meet the criteria of stability and dependability, this study exposed the ARDL model and results to further post-tests analysis (Table 4.7).

4.2.7 Breusch-Godfrey serial correlation LM test

In order to assess whether or not the model was free of serial correlation, the Breusch-Godfrey Serial Correlation LM Test was developed. It was meant to accept or reject the null hypothesis that the ARDL model is free of serial correlation.Because of this, the F-stat (0.6854) and observed R-squared (0.1354) probability in the Breusch-Godfrey serial correlation LM test in Table 4.8 are both larger than 0.05 in the probability distribution.The null hypothesis is therefore accepted that there is no serial correlation in the ARDL model.As a consequence of the statistical result of the Breusch-Godfrey Serial Correlation LM Test, it is possible to conclude that the model does not contain first- and second-order serial correlation. Until now, the ARD\L analysis has been stationary. As a result, despite the fact that the pre-sample missing value delayed residuals have been set to zero, the ARDL model is adequate to capture all of the model's dynamics.

TABLE 4.7

ARDL short-run error correction term (ECT) result

Dependent Variable: D(LGFCF)

Selected Model: ARDL(4, 4, 4, 4, 4)

ECM Regression

Case 2: Restricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LGFCF(-1))	-0.520323	0.193788	-2.685006	0.0436
D(LGFCF(-2))	-0.046148	0.188338	-0.245025	0.8162
D(LGFCF(-3))	1.168627	0.247021	4.730889	0.0052
D(LASI)	1.654821	0.256005	6.464014	0.0013
D(LASI(-1))	1.127562	0.274115	4.113464	0.0092
D(LASI(-2))	0.788316	0.198906	3.963260	0.0107
D(LASI(-3))	0.553451	0.173179	3.195825	0.0241
D(LMTR)	-0.032827	0.084321	-0.389311	0.7131
D(LMTR(-1))	-0.604865	0.116492	-5.192323	0.0035
D(LMTR(-2))	-0.175159	0.107424	-1.630540	0.1639
D(LMTR(-3))	0.241384	0.089656	2.692345	0.0432
D(LNSI)	-0.230463	0.053734	-4.288934	0.0078
D(LNSI(-1))	-0.275208	0.071008	-3.875707	0.0117
D(LNSI(-2))	-0.433051	0.068830	-6.291584	0.0015
D(LNSI(-3))	-0.288451	0.072088	-4.001394	0.0103
D(LNOC)	-0.092436	0.749715	-0.123295	0.9067
D(LNOC(-1))	-10.52075	1.861273	-5.652451	0.0024
D(LNOC(-2))	-8.412996	1.557248	-5.402477	0.0029
D(LNOC(-3))	-4.934924	0.937982	-5.261213	0.0033
CointEq(-1)*	-0.490803	0.079475	-6.175564	0.0016

Source: Researcher's computation using E-views 10.0 statistical software (2021)

TABLE 4.8

The Breusch-Godfrey serial correlation LM test

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	0.429622	Prob. F(2,13)	0.6854
Obs*R-squared	4.679373	Prob. Chi-Square(2)	0.1354

Source: Researcher's computation using E-views 10.0 statistical software (2021)

4.2.8 CUSUM stability test

The goal is to use the CUSUM stability test analysis to determine the model's stability. According to the CUSUM stability test requirement, the centre line (trend) must not lie outside the setregion surrounded by two slant lines. The CUSUM stability test in Fig. 3 demonstrated that this criterion was met adequately. Hence, the ARDL model is stable or has stability at the 5% level of significance.

4.2.9 Variance inflation factor

When the predictor variables are not linearly connected, the variance of the calculated regression coefficients is exaggerated. It's a term that describes how much multicollinearity (correlation between predictors) there is in a regression study. Multicollinearity is risky since it raises the variance of regression coefficients. The VIF numeric value reflects how much variance (standard error squared) for each coefficient is inflated (in decimal notation).This is a rule of thumb for interpreting the inflation factor of variance utilized in this study:

If the VIF is less than or equal to 1, it shows that there is no correlation between the variables.

A VIF ranging from 1 to 5 implies that the variables are only moderately related to one another.

Data that has a VIF greater than 5 implies that the data is highly connected together.

The VIF Tolerance values of the variables were consistently smaller than 1 in Table 4.9. Furthermore, because the VIF values are consistently lower than 1, they reaffirm the absence of multicollinearity among the variables studied, as suggested by Neter *et al.* (1996), Cassey & Anderson (1999). and Mehrara & Musai (2013). According to Tabachnick & Fidell (2006) and Mehrara & Musai (2008), there is no multicollinearity (which is not hazardous) (2013).

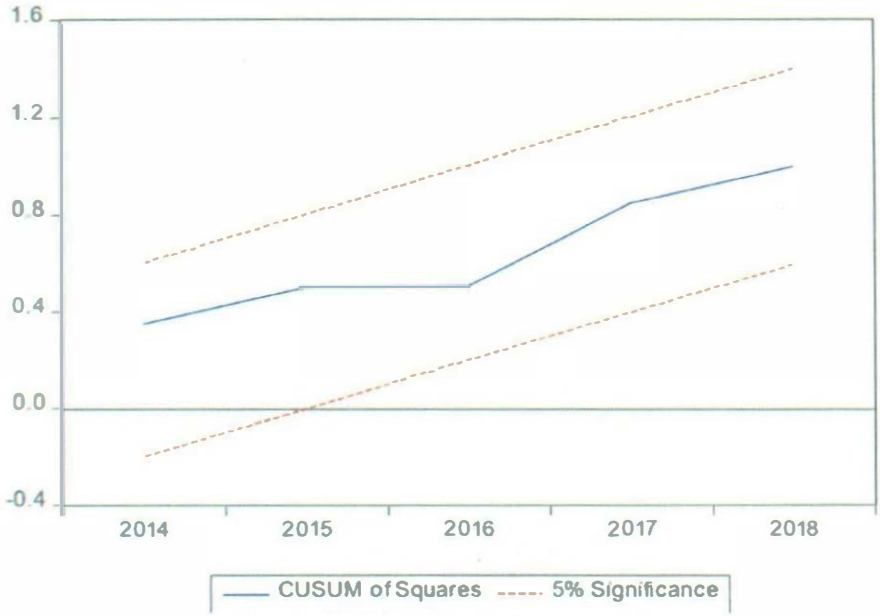

FIG. 3: CUSUM Stability test

Source: Researcher's computation using E-views 10.0 statistical software (2021)

TABLE 4.9

Variance inflation factors test

	Coefficient	Uncentered	Centered
Variable	Variance	VIF	VIF
LGFCF(-1)	0.074265	6228.167	68.70242
LGFCF(-2)	0.089344	7631.813	80.55813
LGFCF(-3)	0.107155	9321.785	93.37049
LGFCF(-4)	0.107214	9520.122	83.68348
LASI	0.004927	664.4728	183.6732
LASI(-1)	0.006260	803.5744	263.0468
LASI (-2)	0.003377	411.3309	146.9364
LASI (-3)	0.003392	396.3992	159.8593
LMTR	0.001558	283.2117	62.86707
LMTR(-1)	0.001863	316.9068	82.04501
LMTR(-2)	0.002212	355.6650	99.99130
LMTR(-3)	0.002017	301.3238	91.45400
LMTR(-4)	0.001130	159.0723	51.13754
LNSI	0.005585	549.6786	168.5648
LNSI(-1)	0.001779	163.6668	59.61395
LNSI(-2)	0.003499	298.8839	118.2867
LNSI(-3)	0.001863	153.5644	65.44268
LNSI(-4)	0.001437	111.7598	50.77101
LNOC	0.001189	148.4868	18.05890
LNOC(-1)	0.000816	92.37746	12.99335
LNOC(-2)	0.000806	83.90021	15.76579
LNOC(-3)	0.000224	21.75791	7.632872
C	0.335710	2713.210	NA

Source: Researcher's computation using E-views 10.0 statistical software (2021)

TABLE 4.10

Breusch-Pagan-Godfrey heteroskedasticity test

Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	0.477118	Prob. F(24,5)	0.8990
Obs*R-squared	20.88192	Prob. Chi-Square(24)	0.6457
Scaled explained SS	0.880320	Prob. Chi-Square(24)	1.0000

Source: Researcher's computation using E-views 10.0 statistical software (2021)

response variable assuming that non-linear combinations of the explanatory factors have any predictive ability in characterizing the response variable in any way.In that scenario, the model is misspecified in the sense that the data-producing process (disambiguation needed) could be better represented by a polynomial or similar non-linear functional form. The F-statistic (0.7032) and the t-statistic (0.4945) in Table 4.11 have a p-value of just above 0.05; hence the null hypothesis that the powers of the response variable have zero coefficients is accepted. As a result, the null hypothesis prevails, implying that the model's functional form is correctly defined and contains no missing variables.

4.2.12 Impulse response functions

The impulse response function illustrates the reaction of the dependent variable to a one standard deviation shock in itself as well as the response of the dependent variable to other independent variables in the estimated model for the time period under consideration. For a period of ten years, the Cholesky one standard deviation innovation was used to analyze the impulse response functions.

The impulse response function revealed that gross fixed capital formation in Nigeria responded positively to a shock in all years opted for the analysisin this study, which is the first to the tenth year.The outcome suggests that some advances on their own influenced capital production through components other than the variables under research.

Similarly, in Nigeria, gross fixed capital formation responded unfavourably to all shares index's shocks only in the second year, but positively in the following years, the first year, year three, year four, year five, year six, year seven, year eight, year nine, and year ten. Meanwhile, according to Table 4.12, Nigeria's gross fixed capital

Table 4.11

The outcome of the Ramsey regression equation specification error test (RESET)

Ramsey RESET Test

Equation: UNTITLED

Specification: LGFCF LGFCF(-1) LGFCF(-2) LGFCF(-3) LGFCF(-4) LASI LASI(-1) LASI(-2) LASI(-3) LASI(-4) LMTR LMTR(-1) LMTR(-2) LMTR(-3) LMTR(-4) LNSI LNSI(-1) LNSI(-2) LNSI(-3) LNSI(-4) LNOC LNOC(-1) LNOC(-2) LNOC(-3) LNOC(-4) C

Omitted Variables: Squares of fitted values

	Value	Df	Probability
t-statistic	0.703225	4	0.5207
F-statistic	0.494526	(1, 4)	0.5207

F-test summary:

	Sum of Sq.	Df	Mean Squares
Test SSR	0.023880	1	0.023880
Restricted SSR	0.217032	5	0.043406
Unrestricted SSR	0.193152	4	0.048288

Source: Researcher's computation using E-views 10.0 statistical software (2021)

TABLE 4.12

Impulse response function

Response of LGFCF:

Period	LGFCF	LASI	LMTR	LNSI	LNOC
1	0.242735	0.000000	0.000000	0.000000	0.000000
2	0.168244	-0.035833	-0.112191	0.079641	-0.018297
3	0.118660	0.050109	-0.162660	0.012843	0.002419
4	0.178776	0.128922	-0.139791	0.134146	-0.004109
5	0.172020	0.171682	-0.123761	0.184862	-0.042085
6	0.112797	0.223398	-0.246380	0.188057	-0.022459
7	0.109540	0.275869	-0.203825	0.261025	-0.038125
8	0.103081	0.349885	-0.181659	0.346877	-0.072315
9	0.096831	0.416577	-0.224436	0.379074	-0.087179
10	0.067073	0.468152	-0.251794	0.443518	-0.095580

Response of LASI:

Period	LGFCF	LASI	LMTR	LNSI	LNOC
1	0.052519	0.253826	0.000000	0.000000	0.000000
2	0.186495	0.349136	-0.140952	-0.003105	0.034588
3	0.047648	0.298048	-0.298794	0.005673	0.085044
4	-0.045709	0.349187	-0.296682	0.006823	0.104353
5	0.037365	0.440788	-0.213103	0.118635	0.064316
6	0.055406	0.475756	-0.239363	0.163731	0.036405
7	-0.018540	0.494261	-0.344944	0.155967	0.059971
8	-0.038406	0.545132	-0.306114	0.219900	0.047916
9	-0.016419	0.620971	-0.263647	0.300717	0.008398
10	-0.020111	0.673878	-0.312759	0.331268	-0.004225

Response of LMTR:

Period	LGFCF	LASI	LMTR	LNSI	LNOC
1	-0.134304	0.122138	0.520214	0.000000	0.000000
2	-0.094990	0.313070	0.345793	-0.000498	-0.128584
3	-0.021253	0.346868	0.275282	-0.054261	-0.159055
4	-0.133228	0.320784	0.364983	0.036886	-0.122227
5	-0.155956	0.363435	0.449289	0.022723	-0.160879
6	-0.113437	0.396936	0.378972	0.039573	-0.179955
7	-0.115138	0.383116	0.421514	0.056818	-0.187068
8	-0.156640	0.394007	0.415335	0.066519	-0.182299
9	-0.138901	0.416031	0.425363	0.068384	-0.195059
10	-0.133699	0.425889	0.423128	0.095035	-0.202820

Response of LNSI:

Period	LGFCF	LASI	LMTR	LNSI	LNOC
1	-0.019239	0.142655	0.366732	0.979978	0.000000
2	0.134415	0.213166	0.580907	0.862551	-0.043721
3	-0.163756	0.165173	-0.303936	0.946865	0.100741
4	-0.207630	0.300837	0.069507	1.092682	0.002989
5	-0.126269	0.646681	0.156334	1.494739	-0.090285

6	-0.048829	0.831885	0.053240	1.553298	-0.172993
7	-0.287591	0.949376	-0.274722	1.711254	-0.131756
8	-0.349377	1.190826	-0.086869	1.926749	-0.214052
9	-0.311756	1.492604	-0.075827	2.236412	-0.323067
10	-0.341821	1.705765	-0.179719	2.394025	-0.393379

Response of LNOC:

Period	LGFCF	LASI	LMTR	LNSI	LNOC
1	-0.031115	0.012428	-0.003050	-0.005425	0.046171
2	-0.023259	0.009639	-0.007136	-0.004372	0.041494
3	-0.030114	0.010424	-0.040676	-0.005867	0.039351
4	-0.025738	0.013679	-0.026023	-0.003542	0.045292
5	-0.026008	0.015594	-0.019297	0.009692	0.043566
6	-0.028173	0.018726	-0.032450	0.002158	0.041831
7	-0.029811	0.020814	-0.038827	0.006190	0.044721
8	-0.029428	0.024526	-0.026143	0.014256	0.041581
9	-0.029936	0.030373	-0.032257	0.016090	0.040159
10	-0.030312	0.032763	-0.036701	0.017390	0.040249

Cholesky Ordering: LGFCF LASI LMTR LNSI LNOC

Source: Researcher's computation using E-views 10.0 statistical software (2021)

Lastly, only the first year of gross fixed capital formation in Nigeria responded positively to shocks in the number of companies. In contrast,Nigeria's response to increases or decreases the number of companies in the second through tenth year of gross fixed capital formation showed a negative response.

Furthermore, the results of the impulse response function, as shown in Table 4.12, revealed that in the first year, the second year, the third year, the fourth year, the fifth year, the sixth year, the seventh year, the eighth year, the ninth year, and the tenth year, the all shares index in Nigeria responded positively to its shock. Furthermore, in the fourth year, the seventh year, the eighth year, the ninth year, and the tenth year, Nigeria's stock exchange's all shares index responded negatively to shocks in the foration of gross fixed capital, but positively to shocks in gross fixed capital formation in the remaining years beingthe first year, the second year, the third year, the fifth year, and the sixth year.

Meanwhile, the results in Table 4.12 reveal that the all-share index in Nigeria only responded favourably to market turnover ratio shocks in the first year, but that it did so negatively in the second, third, fourth, fifth, sixth, seventh, eighth, ninth, and tenth years.

Results given in Table 4.12, on the other hand, suggested that the all shares index in Nigeria only responded negatively to new stock issue shocks in the second year, but that it responded favourably in the first to tenth year apart from the secomd year. Finally, only the tenth year of the Nigerian all-share index responded positively to shocks in the number of companies. In contrast,only the first to the ninth year of the index responded negatively to shocks in the number of companies.

Furthermore, the results of the impulse response function, as shown in Table 4.12, revealed that from the first through the tenth year, Nigeria's market turnover ratio responded positively to its shock. Nigeria's market turnover ratio responded negatively

to shocks by gross fixed capital formation in the first through the tenth year contrastingly.

Meanwhile, according to Table 4.12, in the first year to the second year through the tenth year, Nigeria's market turnover ratio responded favourably to all-shares index shocks. The findings given in Table 4.12, on the other hand, suggested that the market turnover ratio in Nigeria responded positively to new stock issuance shocks in the first year only. The response to shocks by new issues to market turnover ratio was rather negative from the second year through the tenth year. Finally, only the first year of the market turnover ratio in Nigeria responded positively to shocks in the number of companies. In contrast,Nigeria's second through tenth years as regards market turnover ratio responded negatively to shocks in the number of companies.

Furthermore, as shown in Table 4.12, the impulse response function results revealed that new stock issues in Nigeria responded positively to their shock through all the years being considered. Similarly, just as it did to its own shock, new stock issues in Nigeria responded favourably to all shares index shocks. New stock issues in Nigeria, on the other hand, only responded positively to shocks in gross fixed capital formation in the second year. In contrast,they responded negatively to gross fixed capital formation shocks throughout the years being considered for the IRF.

Table 4.12 also shows that new stock issues in Nigeria responded positively to shocks by the market turnover ratio through six years only being the first, second, fourth, fifth and sixth years, only. Still, in the third, seventh, eighth, ninth, and tenth years, new stock issues in Nigeria responded negatively to shocks by market turnover ratio.

According to table 4.12, new stock issues in Nigeria for the first, third and fourth years responded positively to shocks in the number of companies, but negatively

to shocks in the number of companies in the remaining alternate number of years compared to the previous scenario upto the tenth year

In the same vein, the results of the impulse response function, as shown in Table 4.12, revealed that in all the ten years considered for the IRF, the number of companies quoted on the Exchange in Nigeria responded positively to their shock. The same situation is observed asthe number of companies in Nigeria's stock market responded positively to shocks by the all shares index from the first year through the tenth year. Contrastingly, in the first year through the tenth year, the number of quoted companies in Nigeria responded negatively to shocks by gross fixed capital formation.

Finally, according to Table 4.12, the number of quoted companies in Nigeria responded negatively to shocks by market turnover ratio all through the preferred years for the IRF. Finally, the number of quoted companies in Nigeria reacted poorly to new stock issue shocks in the first, second, and third years, but positively to new stock issue shocks in sven of the years considered. This reaction occurred between the fourth and the tenth year.

4.3 Test of hypotheses

Four hypotheses were set up, following which four equations and four models were constructed for regression purposes. At a 5% threshold of significance, all of the hypotheses will be evaluated.

It has already been mentioned that the decision rule for testing each hypothesis for this purpose in the null form is as follows:

H_0: $\rho 1 = \rho 2 = \rho 3 = \rho 4 = 0$.

The Pesaran tabulated critical values are compared to F-statistics to determine if the null hypothesis is rejected or accepted.The following is the decision rule:

I. No co-integration exists when the F-statistics is smaller than the Pesaran determined lower bound I(0).

2. If the F-statistics is greater than the lowest bound I(1) obtained by Pesaran, then there is co-integration between them.
3. When the F statistic value is between the limits of I(0) and I(1), the result is inconclusive.

Test of hypothesis one

H_0: Between 1980 and 2018, the all-share index had no significant impact on capital formation in Nigeria;

H_1: Between 1980 and 2018, the all-share index significantly impacted capital formation in Nigeria.

From the result in Tables 4.13, it can be deduced that all shares index {0.0993} is less than 6.61, which represents the f-tabulated, implying that all shares index is statistically non-significant at various lags as the case may be. All things being equal, the study adopts the null hypothesis and therefore concludes that all share index has no meaningful influence on capital formation in Nigeria in the short run. Thus, the alternate hypothesis that all share index had a significant effect on capital formation in Nigeria between the scope understudy is rejected.

Test of hypothesis two

H_0: There is no synergy between the number of companies listed on the Nigerian stock exchange and capital formation in Nigeria.

H_1: There is synergy between the number of companies listed on the Nigerian stock exchange and capital formation in Nigeria.

From the result in Table 4.13, it can be deduced that number of companies {2.68} is less than 6.61, which represented the f-tabulated, implying that the number of companies is statistically non-significant at various lags as the case may be. All things being equal, the study accepts the null hypothesis and therefore concludes that there is no synergy between the number of companies on the Nigerian stock exchange and

TABLE 4.13

Summarized f-test from the ARDL WALD coefficient restrictions test

Summarized f-test	f-tab	Corresponding probability	Remarks
ASI: C(5)+C(6)+C(7)+C(8)+C(9) =0 {0.099}	± 6.61	0.8963	Insignificant
MTR: C(10)+C(11)+C(12)+C(13)+C(14) =0 {4.08}	± 6.61	0.0993	Insignificant
NSI: C(15)+C(16)+C(17)+C(18)+C(19) =0 {0.003}	± 6.61	0.9544	Insignificant
NoC: C(20)+C(21)+C(22)+C(23)+C(24) =0 {2.68}	± 6.61	0.1624	Insignificant

Source: Researcher's computation using E-views 10.0 statistical software (2021)

capital formation in Nigeria in the short run. Thus, the alternate hypothesis that synergy exists between the number of companies on the Nigerian stock market and Nigeria's capital formation is rejected.

Test of hypothesis three

H_0: The introduction of new issues into the Nigerian stock market had no discernible impact on capital formation.

H_1: The introduction of new issues into the Nigerian stock market had a discernible impact on capital formation.

From the result in Table 4.13, it can be deduced that new stock issues {0.003}is less than 6.61, which represents the f-tabulated. This result implies that new stock issues are statistically insignificant at various lags, as the case may be. All things being equal, the study adopts the null hypothesis and therefore concludes that new stock issues has no meaningful influence on capital formation in Nigeria in the short run. Thus, the alternate hypothesis here that new stocks issued into the Nigerian stock market had a discernibleimpact on Nigeria's capital formation is rejected.

Test of hypothesis four

H_0: In Nigeria, the market turnover ratio had no significant impact on capital formation.

H_1: In Nigeria, the market turnover ratio had a significant impact on capital formation.

From the result in Table 4.13, it can be deduced that market turnover ratio {4.08} is less than 6.61, which represents the f-tabulated, implying that market turnover ratio is statistically non-significant at various lags as the case may be. All things being equal, the study accepts the null hypothesis and therefore concludes that: there is no significant effect of market turnover ratio on capital formation in Nigeria in the short

run. Thus, the alternate hypothesis that market turnover ratio had a significant impact on Nigeria's capital formation is rejected.

4.4 Discussion of findings

The effect of stock market performance in Nigeria between 1980 and 2018 on capital formation was established from the estimated models, the test of hypothesis, and other parameters. Narrowing to specific market performance variables extracted from literature, the study employed modern econometric techniques to attain its objectives without spuriousness.

The analysis discovered that the Nigerian stock market has evolved considerably with specific observed growth in all the observed variables, though with swings akin toa stock market's widely held and noted volatile nature. The growth, however, is not commensurate with the gross fixed capital formation in different observed lagged periods.

According to the findings of the study, there are certain impacts of stock market performance factors on capital formation in Nigeria throughout the time period under investigation.It was discovered as a consequence of this study that all share index had a positive influence on capital formation in Nigeria at varying lags throughout the short run.The vast range of operations in the stock market, as a result of this attribute, has a significant influence on capital formation in Nigeria in the short run. The impact may have been due to the increasing investment by investors in the market. On the other hand, an insignificant decrease was observed in capital formation in Nigeria as a result of an insignificant negative effect of all shares index, which is not in tandem with short-run expectations of the stock market as this differs from the submissions of Ngerebo-A and Torbira (2014), Popoola *et al.* (2017), and Odilli and Ede (2013). They examined

the causal link between the stock market and economic growth with GFCF as a variable.

While there is a substantial negative impact of market turnover ratio as it relates to formation of capital in the short run, it had a number of beneficial impacts on the development of gross fixed capital. It was insignificant too in several lagged periods in the short run. The outcome implies that the stock market activities in Nigeria may need to boost the intellectual property of companies quoted in the market. Hall (2001) asserts that this will reverberate in boosting capital formation as firms exist for production out of the intellectual property.

On the other hand, short term capital formation is not increased as a result of new stock issues or offerings considering the short run. However, new stock issuespositively affect capital formation though insignificant in several lagged periods in the short run. This conclusion is consistent with the findings of Briggs (2015), who used total new issues as one of the independent variables in her analysis and showed that total new issues were positively associated to economic development, the birthing of capital formation, and the creation of new jobs.

The number of quoted firms in Nigeria also has a limited impact on capital formation in the short run.However, it (number of companies)has an impact on formation of capital positively in Nigeria in the several lagged period in the short run. This positive influence is, however, insignificant. This insignificant influence can be likened to Odife (2000) submission, which posits that sub-Saharan Africa markets have lagged behind developments in other parts of the world. There is ashortage of industries whose securities would be traded by wealthy potential brokers.

The link and consequences of stock market performance on Nigeria's capital formation, given the empirical examination of the ARDL result, in the long run, shows

that stock market performance indices positively affect capital formation at various lagged periods in the long run. The characteristic agrees with the findings of Ngerebo-A and Tobira (2014), Odilli and Ede (2013), and Adeleye (2018). They were all looking into the link between the stock market and economic growth, with a particular emphasis on capital formation.

Furthermore, it can be said that stock market performance effects on capital formation in Nigeria between 1980 and 2018 in Nigeria were fairly significant. This fact, from the study, is positive, thus, laying credence to the postulations of the Harrod-Domar growth model. Moreover, the symbiotic relationship between stock market performance and capital formation cannot be overemphasized as stock market performance variables have been seen to have a considerable impact on capital formation, mostly in the long run. Furthermore, the stagnancy of some stocks' prices and the rational behaviour of investors can be ascribed to the seeming negligible effect of stock market performance on capital formation coupled with seeming poor management of the respective quoted companies, inadequate evaluation of new issues and little or no effect of market turnover ratio as they relate to capital formation.

Finally, varied shocks from stock market performance variables of all shares index (ASI), new stock issues (NSI), market turnover ratio (MTR) and the number of companies (NoC) experienced by capital formation illustrates only NSI having a positive shock to capital formation for a longer period compared to ASI that had a prior negative shock towards capital formation before being positive. On the other hand, MTR had shocks in the first year towards capital formation in a random observed period, which was positive. This positive shock became negative in other years, similar to shocks experienced by capital formation through NoC.

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.1 Summary of findings

The purpose of the study was to determine the relationship between stock market performance and capital formation in Nigeria from 1980 to 2018 through the use of secondary instruments in the collection of data.Series of analyses were conducted to investigate how these variables, whether independently or collectively, affected capital formation in Nigeria during the sample period utilizing contemporary econometric methods.The following discoveries were identified based on the outcomes of the specified hypotheses and other operations on data collected for this study:

1. One of the most important indicators of the health of the market in Nigeria is the all-share index, which measures how well the market is doing.However, while the ASI has a minimal influence on gross fixed capital creation in the short run, the changing average value of share prices of all businesses listed on a stock exchange (ASI) has a negligible effect on capital formation in the long run, as has been shown.
2. When it comes to selling shares of a specific firm on the stock market, the market turnover ratio reflects how simple or difficult it is.Capital formation is not significantly affected by the number of shares that change hands during a given period when compared to the total number of shares that could have been traded during the same period under study, according to the findings of the study.
3. When government or companies especially issue new stocks in the Nigerian stock exchange, be it a public issue or private placement, there ought to be a major effect on capital formation as there will be a multiplier effect in terms of increased production on the side of the company and a boost to economic activities in terms

of allied services. From this study, however, new stocks issued into the Nigerian stock market did not have any substantial influence on capital formation in Nigeria

4. The number of companies listed on the stock market in Nigeria for trading, which should be a source of liquidity to the firm and foremost source of liquidity to stockholders, does not impress much on capital formation. This finding points to the lack of synergy between quoted firms and capital formation and, by extension, economic growth.
5. Finally, all of the stock market performance factors that were observed for this study had a short run influence on capital formation in Nigeria, which was negligible. They did, however, have a beneficial influence on capital creation in the long run, assuming that all other factors were equal. The effect, in a nutshell, was significant.

5.2 Conclusion

From the forgone chapters and sections of this study, it can be deduced that stock market performance in Nigeria does not affect capital formation to a large extent in the short run, perhaps due to the profit-seeking behaviour of investors who often monitor the market for either an appreciation or depreciation in the value of a stock to take a position whether to buy, hold or sell. More so, the long-run relationship effects observed between some of the stock market performance variables and capital formation in the period under study were mostly positive. While there has been a significant growth in the all-share index on the Nigerian stock market over the time under review, this has not resulted in a significant increase in capital formation in the short run. Though it does result in capital formation in the longrun, the postulations of Harrod-Domar (1939, 1946) come to fore such that continuous and sustained investment, most especially in the stock market, will lead to economic growth derived

from capital formation through the increase of capital stock. The period under study suggests underutilization of investments and or liquidity generated within and from the stock market in Nigeria.

There is a deviation from the purpose(s) of stock markets in Nigeria, as stocks traded do not add up significantly towards capital formation in Nigeria in the shortrun. This deviation forecloses dearth in reinvestment in the Nigerian Stock Market of shares bought and or sold in the market thus, signifying a serious apathy towards investments in the stock market by investors and would-be investors.

A new stock issue not contributing significantly to capital formation over the study period, both in the short and long run, appears to be at the pinnacle of widely suspected insider abuses and information hoarding, and thus appears to be in direct opposition to the efficient market hypothesis (EMH), which is one of the most widely held postulate in the stock market literature.

When shares or stocks are issued either publicly or privately, they ought to boost capital formation. However, the objective of the stated activities is not the case, as seen from the current study's results. While stocks issued publicly envisages new companies' entrant into the market, stocks issued privately often portends expansion in the scope and operations of firms on the market. These activities are sine qua non to capital formation.

Finally, the economic growth of Nigeria seems a mirage as there is a lack of focus on capital formation given the general relationship effect established in the course of this study as it relates especially to firms quoted in the market. This submission may be the outcome of policymakers concentrating their attention primarily on banks at the expense of the stock market in the financial system. On the other hand, the intellectual

propriety of the firms on the Exchange seems limited, which may inhibit further investments in them.

5.3 Recommendations

Taking into consideration the outcomes of this research, the following suggestions are made:

1. Financial system's regulators in Nigeria will have to synchronize their activities to forge a major positive effect of the stock market performance variables on capital formation thus economic growth.
2. Operators of the stock market in Nigeria should foster continuous and sustained investments in the stock market, which, when combined with financial and core business integrity, will improve the stock market further and boost capital formation.
3. Investors should be educated adequately on reinvestment in the stock market and appropriate disinvestment to boost the stock markets attainment of the purpose(s) of her existence, capital formation being one of the purposes.
4. There is a need to stem and or eliminate insider abuses through a thorough evaluation and reevaluation of corporate governance frameworks of companies listed and those about to be listed in the market. This exercise of evaluation and reevaluation is necessary as the stock market being a 'barometer' of economic growth cannot be overemphasized.
5. Publicly traded firms need to focus on profitable production expansion to adequately boost capital formation as funds invested in a firm's stock will have a multiplier effect from the production process through the utilization of the

firm's products by other companies and customers. The economic activities of allied stakeholders such as peasant sellers and producers of basic overheads utilized by the companies will be boosted.

6. Building upon the findings of this study, a focus is indeed necessary for further research in the areas of the effect of daily returns of the stock market on capital formation and the need to re-engineer all the market variables considered in this study and those that are not.

5.4 Contributions to knowledge

The study was carried out in a developing country in sub-Saharan Africa being Nigeria. Studies bordering on the subjectmatter under consideration within the aforementioned geographical location are sparse; hence, the evolving literature on a stock market's impact on capital formation in a developing country and an economy, especially sub-Saharan Africa, has been improved upon through the current study.

Also, the current study has added to the existing literature on stock market investigations in not just inquiring the market's attainment of penned objectives in a country but redirecting focus towards a neglected phenomenon of the objectives of a stock market especially, capital formation.

Furthermore, there has been a deeper knowledge of the influence of stock market performance on capital creation during the period covered by the present study, which is 1980 - 2018. In no small measure, this will assist a wide array of stakeholders in the market and the economy at large for forecast purposes, investment, divestments, nation-building, and several other attendant benefits that go with the existence of a stock market. To this end, a research gap has greatly been filled.

Finally, the conceptual framework of this study has opened a new vista in studies bordering on the respective subjectsmatter. The concepts are novel regarding the inquiry patterns, which further closes a missing link in several similar studies on a stock market that assesses its relationship to capital formation and economic growth in general.

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APPENDIX

Descriptive statistics

	GFCF	MTR	NOC	NSI	ASI
Mean	1175.734	59.79264	256.3077	292807.6	16075.71
Median	242.9000	58.66389	260.0000	5858.200	10908.48
Maximum	5113.040	175.5875	310.0000	1935080.	50424.70
Minimum	8.800000	5.887446	188.0000	159.8000	117.2800
Std. Dev.	1538.221	35.46542	27.37186	595210.8	15299.91
Skewness	1.083537	0.708581	-0.643074	2.022487	0.633416
Kurtosis	2.685380	4.298843	3.434961	5.458628	2.285795
Jarque-Bera	7.792196	6.004926	2.995472	36.41082	2.996185
Probability	0.020321	0.049665	0.223636	0.000000	0.223556
Sum	45853.64	2331.913	9996.000	11419496	546574.3
Sum Sq. Dev.	89912700	47796.25	28470.31	1.35E+13	7.72E+09
Observations	39	39	39	39	34

ADF unit root tests

Null Hypothesis: LGFCF has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-0.970437	0.7540
Test critical values:	1% level	-3.615588	
	5% level	-2.941145	
	10% level	-2.609066	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LGFCF)
Method: Least Squares
Date: 02/04/20 Time: 21:08
Sample (adjusted): 1981 2018
Included observations: 38 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LGFCF(-1)	-0.024224	0.024961	-0.970437	0.3383

C	0.248040	0.147363	1.683190	0.1010

R-squared	0.025493	Mean dependent var	0.114742
Adjusted R-squared	-0.001577	S.D. dependent var	0.328733
S.E. of regression	0.328992	Akaike info criterion	0.665630
Sum squared resid	3.896488	Schwarz criterion	0.751818
Log likelihood	-10.64696	Hannan-Quinn criter.	0.696295
F-statistic	0.941747	Durbin-Watson stat	1.400449
Prob(F-statistic)	0.338304		

Null Hypothesis: D(LGFCF) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.676029	0.0087
Test critical values:	1% level	-3.621023	
	5% level	-2.943427	
	10% level	-2.610263	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LGFCF,2)
Method: Least Squares
Date: 02/04/20 Time: 21:09
Sample (adjusted): 1982 2018
Included observations: 37 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LGFCF(-1))	-0.891908	0.242628	-3.676029	0.0008
C	0.100537	0.066669	1.508014	0.1405

R-squared	0.278547	Mean dependent var	-0.036045
Adjusted R-squared	0.257934	S.D. dependent var	0.390876
S.E. of regression	0.336714	Akaike info criterion	0.713371
Sum squared resid	3.968163	Schwarz criterion	0.800447
Log likelihood	-11.19735	Hannan-Quinn criter.	0.744069
F-statistic	13.51319	Durbin-Watson stat	1.479183
Prob(F-statistic)	0.000788		

Null Hypothesis: LASI has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.573408	0.1085
Test critical values:	1% level	-3.646342	
	5% level	-2.954021	
	10% level	-2.615817	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LASI)
Method: Least Squares
Date: 02/04/20 Time: 21:10
Sample (adjusted): 1986 2018
Included observations: 33 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LASI(-1)	-0.065375	0.025404	-2.573408	0.0151
C	0.733002	0.224307	3.267847	0.0027

R-squared	0.176023	Mean dependent var	0.169423
Adjusted R-squared	0.149443	S.D. dependent var	0.302106
S.E. of regression	0.278619	Akaike info criterion	0.340747
Sum squared resid	2.406482	Schwarz criterion	0.431445
Log likelihood	-3.622332	Hannan-Quinn criter.	0.371264
F-statistic	6.622427	Durbin-Watson stat	1.662253
Prob(F-statistic)	0.015076		

Null Hypothesis: D(LASI) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.100644	0.0032
Test critical values:	1% level	-3.653730	
	5% level	-2.957110	
	10% level	-2.617434	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LASI,2)
Method: Least Squares
Date: 02/04/20 Time: 21:13

Sample (adjusted): 1987 2018
Included observations: 32 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LASI(-1))	-0.741346	0.180788	-4.100644	0.0003
C	0.120288	0.062540	1.923397	0.0640

R-squared	0.359184	Mean dependent var	-0.013783
Adjusted R-squared	0.337823	S.D. dependent var	0.370610
S.E. of regression	0.301581	Akaike info criterion	0.500904
Sum squared resid	2.728531	Schwarz criterion	0.592513
Log likelihood	-6.014471	Hannan-Quinn criter.	0.531270
F-statistic	16.81528	Durbin-Watson stat	1.814744
Prob(F-statistic)	0.000289		

Null Hypothesis: LMTR has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.954818	0.3048
Test critical values:	1% level	-3.615588	
	5% level	-2.941145	
	10% level	-2.609066	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LMTR)
Method: Least Squares
Date: 02/04/20 Time: 21:13
Sample (adjusted): 1981 2018
Included observations: 38 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LMTR(-1)	-0.187249	0.095788	-1.954818	0.0584
C	0.710487	0.375896	1.890116	0.0668

R-squared	0.095961	Mean dependent var	-0.007941
Adjusted R-squared	0.070849	S.D. dependent var	0.504743
S.E. of regression	0.486534	Akaike info criterion	1.448178
Sum squared resid	8.521769	Schwarz criterion	1.534367
Log likelihood	-25.51538	Hannan-Quinn criter.	1.478843
F-statistic	3.821312	Durbin-Watson stat	2.160004
Prob(F-statistic)	0.058404		

Null Hypothesis: D(LMTR) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-7.153740	0.0000
Test critical values:	1% level	-3.621023	
	5% level	-2.943427	
	10% level	-2.610263	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LMTR,2)
Method: Least Squares
Date: 02/04/20 Time: 21:14
Sample (adjusted): 1982 2018
Included observations: 37 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LMTR(-1))	-1.185323	0.165693	-7.153740	0.0000
C	-0.003246	0.083557	-0.038848	0.9692

R-squared	0.593854	Mean dependent var	0.010878
Adjusted R-squared	0.582250	S.D. dependent var	0.786148
S.E. of regression	0.508116	Akaike info criterion	1.536323
Sum squared resid	9.036353	Schwarz criterion	1.623400
Log likelihood	-26.42197	Hannan-Quinn criter.	1.567022
F-statistic	51.17599	Durbin-Watson stat	2.076628
Prob(F-statistic)	0.000000		

Null Hypothesis: LNSI has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.383768	0.5800
Test critical values:	1% level	-3.615588	
	5% level	-2.941145	
	10% level	-2.609066	

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

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(LNSI)
Method: Least Squares
Date: 02/04/20 Time: 21:14
Sample (adjusted): 1981 2018
Included observations: 38 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNSI(-1)	-0.088514	0.063966	-1.383768	0.1749
C	0.878119	0.637761	1.376877	0.1771

R-squared	0.050503	Mean dependent var	0.034600
Adjusted R-squared	0.024128	S.D. dependent var	1.169924
S.E. of regression	1.155724	Akaike info criterion	3.178527
Sum squared resid	48.08514	Schwarz criterion	3.264716
Log likelihood	-58.39202	Hannan-Quinn criter.	3.209192
F-statistic	1.914813	Durbin-Watson stat	2.048688
Prob(F-statistic)	0.174950		

Null Hypothesis: D(LNSI) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.300707	0.0000
Test critical values:	1% level	-3.621023	
	5% level	-2.943427	
	10% level	-2.610263	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LNSI,2)
Method: Least Squares
Date: 02/04/20 Time: 21:15
Sample (adjusted): 1982 2018
Included observations: 37 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LNSI(-1))	-1.062842	0.168686	-6.300707	0.0000
C	0.039029	0.197429	0.197684	0.8444

R-squared	0.531452	Mean dependent var	0.003235
Adjusted R-squared	0.518065	S.D. dependent var	1.729175
S.E. of regression	1.200419	Akaike info criterion	3.255757

Sum squared resid	50.43524	Schwarz criterion	3.342834
Log likelihood	-58.23151	Hannan-Quinn criter.	3.286456
F-statistic	39.69890	Durbin-Watson stat	2.004031
Prob(F-statistic)	0.000000		

Null Hypothesis: LNOC has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.983222	0.0456
Test critical values:	1% level	-3.615588	
	5% level	-2.941145	
	10% level	-2.609066	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LNOC)
Method: Least Squares
Date: 02/04/20 Time: 21:15
Sample (adjusted): 1981 2018
Included observations: 38 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNOC(-1)	-0.213745	0.071649	-2.983222	0.0051
C	1.192743	0.397004	3.004357	0.0048

R-squared	0.198211	Mean dependent var	0.008634
Adjusted R-squared	0.175939	S.D. dependent var	0.054597
S.E. of regression	0.049562	Akaike info criterion	-3.120007
Sum squared resid	0.088428	Schwarz criterion	-3.033819
Log likelihood	61.28014	Hannan-Quinn criter.	-3.089342
F-statistic	8.899611	Durbin-Watson stat	2.130570
Prob(F-statistic)	0.005096		

Null Hypothesis: LGFCF_GDP has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-7.236749	0.0000
Test critical values:	1% level	-3.615588	
	5% level	-2.941145	
	10% level	-2.609066	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LGFCF_GDP)
Method: Least Squares
Date: 02/04/20 Time: 21:16
Sample (adjusted): 1981 2018
Included observations: 38 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LGFCF_GDP(-1)	-1.244076	0.171911	-7.236749	0.0000
C	1.999323	0.302444	6.610560	0.0000

R-squared	0.592624	Mean dependent var	-0.063742
Adjusted R-squared	0.581308	S.D. dependent var	0.962188
S.E. of regression	0.622597	Akaike info criterion	1.941361
Sum squared resid	13.95456	Schwarz criterion	2.027549
Log likelihood	-34.88585	Hannan-Quinn criter.	1.972026
F-statistic	52.37054	Durbin-Watson stat	1.959931
Prob(F-statistic)	0.000000		

ARDL short-run dynamics

Dependent Variable: LGFCF
Method: ARDL
Date: 02/04/20 Time: 21:17
Sample (adjusted): 1989 2018
Included observations: 30 after adjustments
Maximum dependent lags: 4 (Automatic selection)
Model selection method: Akaike info criterion (AIC)
Dynamic regressors (4 lags, automatic): LASI LMTR LNSI LNOC
Fixed regressors: C
Number of models evalulated: 2500
Selected Model: ARDL(4, 4, 4, 4, 4)

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
LGFCF(-1)	-0.011126	0.379066	-0.029352	0.9777
LGFCF(-2)	0.474175	0.468612	1.011872	0.3580
LGFCF(-3)	1.214775	0.791331	1.535103	0.1854
LGFCF(-4)	-1.168627	0.790874	-1.477641	0.1995
LASI	1.654821	0.639175	2.588995	0.0489
LASI(-1)	-0.592382	0.419788	-1.411144	0.2173
LASI(-2)	-0.339246	0.723530	-0.468877	0.6589
LASI(-3)	-0.234865	0.600353	-0.391211	0.7118
LASI(-4)	-0.553451	0.322714	-1.714990	0.1470

LMTR	-0.032827	0.161600	-0.203138	0.8470
LMTR(-1)	0.563225	0.351594	1.601918	0.1701
LMTR(-2)	0.429706	0.381843	1.125348	0.3115
LMTR(-3)	0.416543	0.216418	1.924718	0.1122
LMTR(-4)	-0.241384	0.239698	-1.007033	0.3601
LNSI	-0.230463	0.141382	-1.630071	0.1640
LNSI(-1)	-0.052161	0.101668	-0.513056	0.6298
LNSI(-2)	-0.157844	0.077893	-2.026416	0.0986
LNSI(-3)	0.144600	0.070544	2.049786	0.0957
LNSI(-4)	0.288451	0.135422	2.130018	0.0864
LNOC	-0.092436	1.890038	-0.048907	0.9629
LNOC(-1)	0.702643	1.461604	0.480734	0.6510
LNOC(-2)	2.107758	1.533856	1.374156	0.2278
LNOC(-3)	3.478073	2.534417	1.372336	0.2283
LNOC(-4)	4.934924	2.655644	1.858278	0.1222
C	6.931916	0.917254	9.557248	0.0002

R-squared	0.997141	Mean dependent var	6.424477
Adjusted R-squared	0.983420	S.D. dependent var	1.618017
S.E. of regression	0.208342	Akaike info criterion	-0.424365
Sum squared resid	0.217032	Schwarz criterion	0.743299
Log likelihood	31.36548	Hannan-Quinn criter.	-0.050819
F-statistic	72.67024	Durbin-Watson stat	2.519721
Prob(F-statistic)	0.000074		

*Note: p-values and any subsequent tests do not account for model selection.

ARDL Long Run Form and Bounds Test

ARDL Long Run Form and Bounds Test
Dependent Variable: D(LGFCF)
Selected Model: ARDL(4, 4, 4, 4, 4)
Case 2: Restricted Constant and No Trend
Date: 02/04/20 Time: 21:17
Sample: 1980 2018
Included observations: 30

Conditional Error Correction Regression

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-63.31916	37.17254	-1.703385	0.1492
LGFCF(-1)*	-0.490803	0.428955	-1.144185	0.3043
LASI(-1)	-0.065123	0.475089	-0.137075	0.8963
LMTR(-1)	1.135263	0.561813	2.020713	0.0993
LNSI(-1)	-0.007417	0.123368	-0.060121	0.9544
LNOC(-1)	11.13096	6.795660	1.637951	0.1624
D(LGFCF(-1))	-0.520323	0.524179	-0.992644	0.3665
D(LGFCF(-2))	-0.046148	0.417741	-0.110469	0.9163

D(LGFCF(-3))	1.168628	0.790874	1.477641	0.1995
D(LASI)	1.654821	0.639175	2.588995	0.0489
D(LASI(-1))	1.127562	0.837788	1.345880	0.2361
D(LASI(-2))	0.788316	0.483214	1.631402	0.1637
D(LASI(-3))	0.553451	0.322714	1.714990	0.1470
D(LMTR)	-0.032827	0.161600	-0.203138	0.8470
D(LMTR(-1))	-0.604865	0.242035	-2.499084	0.0546
D(LMTR(-2))	-0.175159	0.244189	-0.717306	0.5053
D(LMTR(-3))	0.241384	0.239698	1.007033	0.3601
D(LNSI)	-0.230463	0.141382	-1.630071	0.1640
D(LNSI(-1))	-0.275208	0.149101	-1.845774	0.1242
D(LNSI(-2))	-0.433051	0.147936	-2.927287	0.0327
D(LNSI(-3))	-0.288451	0.135422	-2.130018	0.0864
D(LNOC)	-0.092436	1.890038	-0.048907	0.9629
D(LNOC(-1))	-10.52075	5.241357	-2.007258	0.1010
D(LNOC(-2))	-8.412996	4.733700	-1.777256	0.1357
D(LNOC(-3))	-4.934924	2.655644	-1.858278	0.1222

* p-value incompatible with t-Bounds distribution.

Levels Equation
Case 2: Restricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LASI	-1.294118	0.171395	-7.550500	0.0026
LMTR	-0.685751	0.303787	-2.257341	0.0077
LNSI	-1.127682	0.510023	-2.211041	0.0433
LNOC	0.677111	0.457848	1.478899	0.1700
C	-2.290901	0.230631	-9.933187	0.0005

EC = LGFCF - (-1.2941*LASI - 0.6857*LMTR -1.1276*LNSI + 0.6771*LNOC
-2.2909)

F-Bounds Test			Null Hypothesis: No levels relationship	
Test Statistic	Value	Signif.	I(0)	I(1)
			Asymptotic: n=1000	
F-statistic	7.178133	10%	2.2	3.09
K	4	5%	2.56	3.49
		2.5%	2.88	3.87
		1%	3.29	4.37
			Finite Sample:	
Actual Sample Size	30		n=30	

10%	2.525	3.56
5%	3.058	4.223
1%	4.28	5.84

ARDL Error Correction Regression

ARDL Error Correction Regression
Dependent Variable: D(LGFCF)
Selected Model: ARDL(4, 4, 4, 4, 4)
Case 2: Restricted Constant and No Trend
Date: 02/04/20 Time: 21:18
Sample: 1980 2018
Included observations: 30

ECM Regression
Case 2: Restricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LGFCF(-1))	-0.520323	0.193788	-2.685006	0.0436
D(LGFCF(-2))	-0.046148	0.188338	-0.245025	0.8162
D(LGFCF(-3))	1.168627	0.247021	4.730889	0.0052
D(LASI)	1.654821	0.256005	6.464014	0.0013
D(LASI(-1))	1.127562	0.274115	4.113464	0.0092
D(LASI(-2))	0.788316	0.198906	3.963260	0.0107
D(LASI(-3))	0.553451	0.173179	3.195825	0.0241
D(LMTR)	-0.032827	0.084321	-0.389311	0.7131
D(LMTR(-1))	-0.604865	0.116492	-5.192323	0.0035
D(LMTR(-2))	-0.175159	0.107424	-1.630540	0.1639
D(LMTR(-3))	0.241384	0.089656	2.692345	0.0432
D(LNSI)	-0.230463	0.053734	-4.288934	0.0078
D(LNSI(-1))	-0.275208	0.071008	-3.875707	0.0117
D(LNSI(-2))	-0.433051	0.068830	-6.291584	0.0015
D(LNSI(-3))	-0.288451	0.072088	-4.001394	0.0103
D(LNOC)	-0.092436	0.749715	-0.123295	0.9067
D(LNOC(-1))	-10.52075	1.861273	-5.652451	0.0024
D(LNOC(-2))	-8.412996	1.557248	-5.402477	0.0029
D(LNOC(-3))	-4.934924	0.937982	-5.261213	0.0033
CointEq(-1)*	-0.490803	0.079475	-6.175564	0.0016

R-squared	0.937619	Mean dependent var	0.145528
Adjusted R-squared	0.819095	S.D. dependent var	0.346367
S.E. of regression	0.147320	Akaike info criterion	-0.757699
Sum squared resid	0.217032	Schwarz criterion	0.176433
Log likelihood	31.36548	Hannan-Quinn criter.	-0.458862
Durbin-Watson stat	2.519721		

* p-value incompatible with t-Bounds distribution.

F-Bounds Test — Null Hypothesis: No levels relationship

Test Statistic	Value	Signif.	I(0)	I(1)
F-statistic	3.178133	10%	2.2	3.09
K	4	5%	2.56	3.49
		2.5%	2.88	3.87
		1%	3.29	4.37

Variance Inflation Factors

Variance Inflation Factors
Date: 02/04/20 Time: 21:18
Sample: 1980 2018
Included observations: 30

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
LGFCF(-1)	0.143691	4204.278	288.9296
LGFCF(-2)	0.219597	6093.784	474.0311
LGFCF(-3)	0.626205	16499.80	1465.625
LGFCF(-4)	0.625481	15584.99	1570.702
LASI	0.408545	24252.27	605.9567
LASI(-1)	0.176222	10141.89	310.7277
LASI(-2)	0.523495	29108.32	1056.766
LASI(-3)	0.360424	19385.58	823.6279
LASI(-4)	0.104144	5403.236	265.0816
LMTR	0.026115	277.0272	14.06246
LMTR(-1)	0.123619	1283.725	70.25176
LMTR(-2)	0.145804	1509.347	82.76684
LMTR(-3)	0.046837	490.3315	26.85380
LMTR(-4)	0.057455	599.6917	32.85774
LNSI	0.019989	1608.120	91.44215
LNSI(-1)	0.010336	826.7708	49.92967
LNSI(-2)	0.006067	482.8311	30.63862
LNSI(-3)	0.004976	394.6705	25.74215
LNSI(-4)	0.018339	1451.127	96.45016
LNOC	0.572244	77091.47	8.679125
LNOC(-1)	0.136286	46085.50	5.307103
LNOC(-2)	0.352715	50732.81	6.122239
LNOC(-3)	0.423272	138415.9	17.97997
LNOC(-4)	0.052445	151718.8	25.13816
C	1381.798	955019.9	NA

Serial Correlation LM Test:

Breusch-Godfrey Serial Correlation LM Test:

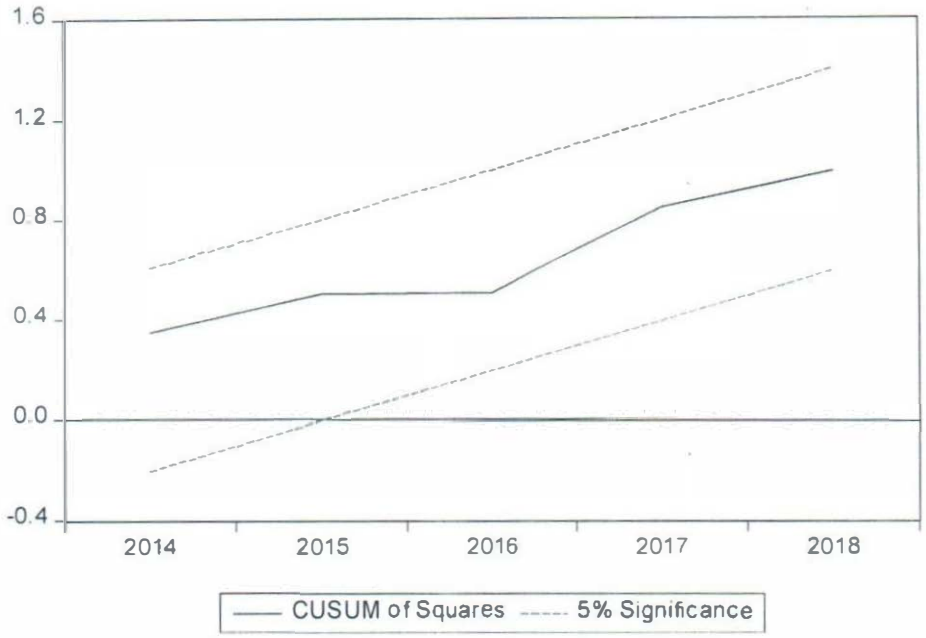
F-statistic	0.429622	Prob. F(2,3)	0.6854
Obs*R-squared	4.679373	Prob. Chi-Square(2)	0.1354

Test Equation:
Dependent Variable: RESID
Method: ARDL
Date: 02/04/20 Time: 21:19
Sample: 1989 2018
Included observations: 30
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LGFCF(-1)	0.273365	0.693666	0.394088	0.7199
LGFCF(-2)	0.190756	0.951398	0.200501	0.8539
LGFCF(-3)	0.327834	1.129529	0.290239	0.7905
LGFCF(-4)	-0.429427	1.188134	-0.361430	0.7417
LASI	0.395638	0.889288	0.444893	0.6865
LASI(-1)	-0.316790	0.587831	-0.538914	0.6274
LASI(-2)	-0.197122	0.870607	-0.226419	0.8354
LASI(-3)	-0.211110	0.756271	-0.279146	0.7983
LASI(-4)	-0.062886	0.459923	-0.136731	0.8999
LMTR	0.114300	0.226140	0.505437	0.6480
LMTR(-1)	0.206903	0.486013	0.425715	0.6990
LMTR(-2)	0.149672	0.506586	0.295452	0.7869
LMTR(-3)	0.030986	0.248604	0.124639	0.9087
LMTR(-4)	-0.132418	0.341924	-0.387273	0.7244
LNSI	-0.063388	0.196779	-0.322126	0.7685
LNSI(-1)	-0.023241	0.136718	-0.169994	0.8758
LNSI(-2)	-0.029130	0.094677	-0.307677	0.7785
LNSI(-3)	0.019478	0.107000	0.182035	0.8672
LNSI(-4)	-0.004781	0.204726	-0.023352	0.9828
LNOC	0.415703	2.216918	0.187514	0.8632
LNOC(-1)	0.472707	1.764216	0.267941	0.8061
LNOC(-2)	0.205123	1.759893	0.116554	0.9146
LNOC(-3)	1.088160	3.208713	0.339127	0.7569
LNOC(-4)	1.402184	3.416002	0.410475	0.7090
C	-19.39441	48.49262	-0.399946	0.7160
RESID(-1)	-0.827256	0.895208	-0.924094	0.4236
RESID(-2)	-0.385028	1.309320	-0.294067	0.7879

R-squared	0.222646	Mean dependent var	-9.23E-15
Adjusted R-squared	-6.514424	S.D. dependent var	0.086509
S.E. of regression	0.237143	Akaike info criterion	-0.542891
Sum squared resid	0.168711	Schwarz criterion	0.718187
Log likelihood	35.14337	Hannan-Quinn criter.	-0.139462
F-statistic	0.033048	Durbin-Watson stat	2.071290
Prob(F-statistic)	1.000000		

CUSUM stability test



Ramsey RESET Test

Ramsey RESET Test
Equation: UNTITLED
Specification: LGFCF LGFCF(-1) LGFCF(-2) LGFCF(-3) LGFCF(-4) LASI LASI(-1) LASI(-2) LASI(-3) LASI(-4) LMTR LMTR(-1) LMTR(-2) LMTR(-3) LMTR(-4) LNSI LNSI(-1) LNSI(-2) LNSI(-3) LNSI(-4) LNOC LNOC(-1) LNOC(-2) LNOC(-3) LNOC(-4) C
Omitted Variables: Squares of fitted values

	Value	df	Probability
t-statistic	0.703225	4	0.5207
F-statistic	0.494526	(1, 4)	0.5207

F-test summary:

	Sum of Sq.	df	Mean Squares
Test SSR	0.023880	1	0.023880
Restricted SSR	0.217032	5	0.043406
Unrestricted SSR	0.193152	4	0.048288

Unrestricted Test Equation:
Dependent Variable: LGFCF
Method: ARDL
Date: 02/04/20 Time: 21:19
Sample: 1989 2018
Included observations: 30
Maximum dependent lags: 4 (Automatic selection)
Model selection method: Akaike info criterion (AIC)
Dynamic regressors (4 lags, automatic):
Fixed regressors: C

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
LGFCF(-1)	-0.207382	0.487582	-0.425327	0.6925
LGFCF(-2)	-0.447885	1.401252	-0.319632	0.7652
LGFCF(-3)	-0.813938	3.003183	-0.271025	0.7998
LGFCF(-4)	0.781425	2.895760	0.269851	0.8006
LASI	-0.857871	3.636141	-0.235929	0.8251
LASI(-1)	0.551452	1.685740	0.327128	0.7600
LASI(-2)	0.443604	1.349684	0.328673	0.7589
LASI(-3)	0.176399	0.861962	0.204648	0.8478
LASI(-4)	0.497983	1.533414	0.324754	0.7616
LMTR	-0.113462	0.205425	-0.552328	0.6101
LMTR(-1)	-0.448248	1.485372	-0.301775	0.7779
LMTR(-2)	-0.376161	1.214670	-0.309682	0.7723
LMTR(-3)	-0.267592	0.999274	-0.267787	0.8021
LMTR(-4)	0.201824	0.679067	0.297207	0.7811
LNSI	0.172803	0.592523	0.291638	0.7851
LNSI(-1)	0.055956	0.187448	0.298517	0.7802
LNSI(-2)	0.144210	0.437313	0.329764	0.7581
LNSI(-3)	-0.145510	0.419198	-0.347114	0.7460
LNSI(-4)	-0.214842	0.729806	-0.294382	0.7831
LNOC	-0.435481	2.052306	-0.212191	0.8423
LNOC(-1)	-1.525071	3.523042	-0.432885	0.6874
LNOC(-2)	-2.349127	6.541004	-0.359139	0.7376
LNOC(-3)	-2.419981	8.802836	-0.274909	0.7970
LNOC(-4)	-3.067841	11.71973	-0.261767	0.8064
C	57.38234	176.0609	0.325923	0.7608
FITTED^2	0.114207	0.162404	0.703225	0.5207

R-squared	0.997456	Mean dependent var	6.424477
Adjusted R-squared	0.981555	S.D. dependent var	1.618017
S.E. of regression	0.219745	Akaike info criterion	-0.474264
Sum squared resid	0.193152	Schwarz criterion	0.740107
Log likelihood	33.11397	Hannan-Quinn criter.	-0.085777
F-statistic	62.73049	Durbin-Watson stat	2.672392
Prob(F-statistic)	0.000536		

*Note: p-values and any subsequent tests do not account for model selection.

Heteroskedasticity Test

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	0.477118	Prob. F(24,5)	0.8990
Obs*R-squared	20.88192	Prob. Chi-Square(24)	0.6457
Scaled explained SS	0.880320	Prob. Chi-Square(24)	1.0000

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 02/04/20 Time: 21:20
Sample: 1989 2018
Included observations: 30

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-4.248035	3.036797	-1.398854	0.2207
LGFCF(-1)	-0.007419	0.030968	-0.239566	0.8202
LGFCF(-2)	0.022253	0.038283	0.581277	0.5863
LGFCF(-3)	0.075039	0.064648	1.160742	0.2981
LGFCF(-4)	-0.046703	0.064610	-0.722850	0.5022
LASI	0.045349	0.052217	0.868472	0.4249
LASI(-1)	-0.025120	0.034294	-0.732487	0.4967
LASI(-2)	-0.038869	0.059108	-0.657589	0.5399
LASI(-3)	-0.041771	0.049046	-0.851682	0.4333
LASI(-4)	0.005942	0.026364	0.225365	0.8306
LMTR	0.000721	0.013202	0.054624	0.9586
LMTR(-1)	0.033797	0.028723	1.176631	0.2923
LMTR(-2)	0.038873	0.031195	1.246142	0.2679
LMTR(-3)	0.010909	0.017680	0.617044	0.5642
LMTR(-4)	-0.037481	0.019582	-1.914067	0.1138
LNSI	-0.007857	0.011550	-0.680256	0.5266
LNSI(-1)	-0.004071	0.008306	-0.490174	0.6448
LNSI(-2)	-0.006046	0.006363	-0.950184	0.3857
LNSI(-3)	0.001955	0.005763	0.339277	0.7482
LNSI(-4)	0.001730	0.011063	0.156344	0.8819
LNOC	0.225805	0.154406	1.462413	0.2035
LNOC(-1)	0.067775	0.119405	0.567601	0.5948
LNOC(-2)	-0.065008	0.125308	-0.518783	0.6260
LNOC(-3)	0.267868	0.207048	1.293745	0.2523
LNOC(-4)	0.296473	0.216952	1.366539	0.2300

R-squared	0.696064	Mean dependent var	0.007234
Adjusted R-squared	-0.762829	S.D. dependent var	0.012819
S.E. of regression	0.017020	Akaike info criterion	-5.433899
Sum squared resid	0.001448	Schwarz criterion	-4.266234
Log likelihood	106.5085	Hannan-Quinn criter.	-5.060353

F-statistic	0.477118	Durbin-Watson stat	2.806475
Prob(F-statistic)	0.899032		

ARDL coefficient restrictions test
ASI
Wald Test:
Equation: Untitled

Test Statistic	Value	df	Probability
t-statistic	-0.137075	5	0.8963
F-statistic	0.018790	(1, 5)	0.8963
Chi-square	0.018790	1	0.8910

Null Hypothesis: C(5)+C(6)+C(7)+C(8)+C(9)=0
Null Hypothesis Summary:

Normalized Restriction (= 0)	Value	Std. Err.
C(5) + C(6) + C(7) + C(8) + C(9)	-0.065123	0.475089

Restrictions are linear in coefficients.

MTR
Wald Test:
Equation: Untitled

Test Statistic	Value	df	Probability
t-statistic	2.020713	5	0.0993
F-statistic	4.083279	(1, 5)	0.0993
Chi-square	4.083279	1	0.0433

Null Hypothesis:
C(10)+C(11)+C(12)+C(13)+C(14)=0
Null Hypothesis Summary:

Normalized Restriction (= 0)	Value	Std. Err.
C(10) + C(11) + C(12) + C(13) + C(14)	1.135263	0.561813

Restrictions are linear in coefficients.

NSI

Wald Test:
Equation: Untitled

Test Statistic	Value	df	Probability
t-statistic	-0.060121	5	0.9544
F-statistic	0.003615	(1, 5)	0.9544
Chi-square	0.003615	1	0.9521

Null Hypothesis:
C(15)+C(16)+C(17)+C(18)+C(19)=0
Null Hypothesis Summary:

Normalized Restriction (= 0)	Value	Std. Err.
C(15) + C(16) + C(17) + C(18) + C(19)	-0.007417	0.123368

Restrictions are linear in coefficients.

NOC

Wald Test:
Equation: Untitled

Test Statistic	Value	df	Probability
t-statistic	1.637951	5	0.1624
F-statistic	2.682885	(1, 5)	0.1624
Chi-square	2.682885	1	0.1014

Null Hypothesis:
C(20)+C(21)+C(22)+C(23)+C(24)=0
Null Hypothesis Summary:

Normalized Restriction (= 0)	Value	Std. Err.
C(20) + C(21) + C(22) + C(23) + C(24)	11.13096	6.795660

Restrictions are linear in coefficients.

Impulse response function

Response of LGFCF: Period	LGFCF	LASI	LMTR	LNSI	LNOC

1	0.242735	0.000000	0.000000	0.000000	0.000000
2	0.168244	-0.035833	-0.112191	0.079641	-0.018297
3	0.118660	0.050109	-0.162660	0.012843	0.002419
4	0.178776	0.128922	-0.139791	0.134146	-0.004109
5	0.172020	0.171682	-0.123761	0.184862	-0.042085
6	0.112797	0.223398	-0.246380	0.188057	-0.022459
7	0.109540	0.275869	-0.203825	0.261025	-0.038125
8	0.103081	0.349885	-0.181659	0.346877	-0.072315
9	0.096831	0.416577	-0.224436	0.379074	-0.087179
10	0.067073	0.468152	-0.251794	0.443518	-0.095580

Response of LASI: Period	LGFCF	LASI	LMTR	LNSI	LNOC
1	0.052519	0.253826	0.000000	0.000000	0.000000
2	0.186495	0.349136	-0.140952	-0.003105	0.034588
3	0.047648	0.298048	-0.298794	0.005673	0.085044
4	-0.045709	0.349187	-0.296682	0.006823	0.104353
5	0.037365	0.440788	-0.213103	0.118635	0.064316
6	0.055406	0.475756	-0.239363	0.163731	0.036405
7	-0.018540	0.494261	-0.344944	0.155967	0.059971
8	-0.038406	0.545132	-0.306114	0.219900	0.047916
9	-0.016419	0.620971	-0.263647	0.300717	0.008398
10	-0.020111	0.673878	-0.312759	0.331268	-0.004225

Response of LMTR: Period	LGFCF	LASI	LMTR	LNSI	LNOC
1	-0.134304	0.122138	0.520214	0.000000	0.000000
2	-0.094990	0.313070	0.345793	-0.000498	-0.128584
3	-0.021253	0.346868	0.275282	-0.054261	-0.159055
4	-0.133228	0.320784	0.364983	0.036886	-0.122227
5	-0.155956	0.363435	0.449289	0.022723	-0.160879
6	-0.113437	0.396936	0.378972	0.039573	-0.179955
7	-0.115138	0.383116	0.421514	0.056818	-0.187068
8	-0.156640	0.394007	0.415335	0.066519	-0.182299
9	-0.138901	0.416031	0.425363	0.068384	-0.195059
10	-0.133699	0.425889	0.423128	0.095035	-0.202820

Response of LNSI: Period	LGFCF	LASI	LMTR	LNSI	LNOC
1	-0.019239	0.142655	0.366732	0.979978	0.000000
2	0.134415	0.213166	0.580907	0.862551	-0.043721
3	-0.163756	0.165173	-0.303936	0.946865	0.100741
4	-0.207630	0.300837	0.069507	1.092682	0.002989
5	-0.126269	0.646681	0.156334	1.494739	-0.090285
6	-0.048829	0.831885	0.053240	1.553298	-0.172993

7	-0.287591	0.949376	-0.274722	1.711254	-0.131756
8	-0.349377	1.190826	-0.086869	1.926749	-0.214052
9	-0.311756	1.492604	-0.075827	2.236412	-0.323067
10	-0.341821	1.705765	-0.179719	2.394025	-0.393379

Response of LNOC: Period	LGFCF	LASI	LMTR	LNSI	LNOC
1	-0.031115	0.012428	-0.003050	-0.005425	0.046171
2	-0.023259	0.009639	-0.007136	-0.004372	0.041494
3	-0.030114	0.010424	-0.040676	-0.005867	0.039351
4	-0.025738	0.013679	-0.026023	-0.003542	0.045292
5	-0.026008	0.015594	-0.019297	0.009692	0.043566
6	-0.028173	0.018726	-0.032450	0.002158	0.041831
7	-0.029811	0.020814	-0.038827	0.006190	0.044721
[illegible]	-0.029428	0.024526	-0.026143	0.014256	0.041581