CHAPTER ONE

INTRODUCTION

1.1 Background to the study

Financial system has always played an important role in supporting economic programmes and activities. Sanusi (2010), observed that a well-functioning financial system is able to mobilize household savings, allocate resources, efficiently diversify risk, enhance the flow of liquidity, reduce information asymmetry and transaction cost. These functions therefore, suggest that financial system is expected to play a crucial role in promoting manufacturing sector productivity and economic growth.

The contribution of the financial system towards the growth of the manufacturing sector is mainly credited to the role it plays in savings mobilization and allocation of resources from the surplus to the deficit sectors of the economy (Nwakoby & Ananwude, 2016).Significant roles in intermediation are expected to be carried out by the banking sector and the capital market. As such, there is always the need to reposition them for efficient performance through regular reform process geared towards deepening the financial system to forestall financial crisis and distress (Uduak & Ubong, 2015). It is generally agreed in theoretical literature that intensification of financial instruments and institutions through reforms would greatly reduce transaction and information costs in an economy with a multiplier effect on savings rate, investment decision and technological innovative enterprises (Nwakoby & Ananwude, 2016).

According to Ezu, Okoh and Okoye (2017), the high rate of growth and stability obtainable in developed nations can be attributed to the reforms in their financial system done overtime. Nigerian government has embarked on various reforms geared toward deepening the financial system and thereby making the banks and the capital markets to be among global players in the international financial markets.

Financial deepening are forms of restructuring, innovations or reorganization embarked upon by financial regulatory bodies to reform the financial system, which enables the economic sectors to expand, become buoyant and competitive (Ojo, 2010). Hence, it is therefore expected to enhance manufacturing firm productivity and sustainable economic growth.Mckinnon(1973), in his book on "money, capital and economic development," proposed the theory of financial repression and financial deepening to study the relationship between the financial system and economic growth. According to him, financial repression is the imposition of controls on financial structure and development.

Mackinnon (1973) and Shaw (1973), produced a theoretical basis to show how some financial controls that produce financial repression effect could make the financial sector stifle a country's development instead of promoting it. The studies show that a sound and well-deepened financial system produces effective intermediation process which can promote economic growth and development.

Reforms are expected to stimulate a diversified, resilient and dependable banking industry and capital markets in the country. The reforms are designed to deepen the financial system and enable it develop the required flexibility to support the economic development of the nation by efficiently performing its functions as the pivot of financial intermediation (Lemo, 2005).

The effort of the regulatory body of the Nigerian financial system in embarking on consistent financial reforms is to enhance financial deepening and thereby, boosting economic growth and developments. Growth of economies is derived from investment and productivity in such economy. A key role is assigned to investment in the manufacturing sub-sector as a propellant of real economic growth. The manufacturing sub-sector is expected to dominate, shape and define the core path of industrialization all over the world being a stimulant of aggregate employment, output, demand income, foreign exchange through export, and the key to rapid

economic growth and development. The countries that caught up with and eventually surpassed Britain, such as the United States, Germany and Japan, all did so by building up solid manufacturing base (Mohammed, 2014).

Nigeria is a country with the presence of huge human and material resources. The country has always been referred to as technologically backward and underdeveloped due to its lack of basic infrastructural facilities in all sectors of the economy, high poverty and mortality rates, high rate of unemployment, insecurity of lives and property, and abysmally low level of manufacturing sector productivity (Ojo, 2010; Uwaifo & Uddin, 2009).

A country is said to be technologically backward when it is unable to produce capital goods such as tractors, lathe machines, drilling machines, cars, trains, and other earth moving equipment, when it cannot exploit her natural resources except with the help of foreigners who will normally provide the technology and expertise to undertake the exploitation of her natural resources; when it is unable to mechanize her agriculture and depends on other countries for the supply of its spare parts for industrial machinery; when it exports raw materials to other countries as against finished products and unable to produce her own military hardware with which to defend herself if the need arises (Uwaifo & Uddin, 2009).

In Nigeria, several policies targeted at boosting the productivity of the manufacturing sector towards the growth of the economy have been implemented. The policies include the First Development Plan from 1962 to 1968 which focused on import-substituting industrialization, because most of the manufacturing firms depended solely on imported raw materials for their products. The inability of the firms to get vital raw materials locally affected their productivity negatively. During the second Developmental plan which was from 1970 to 1975, efforts were made to limit the import-substituting industrialization strategy which characterized the first developmental plan. However, lack of technical know-how on the use of some machineries and

relevant raw materials prevented the economy from advancing beyond the elementary phases of these projects (Ojo, 2010).

During the third Developmental plan, from 1975 to 1980, efforts were shifted towards establishment of heavy industries due to oil boom. During the period, the major problem that confronted the manufacturing firms was not funding but the shallow nature of technology in Nigeria. The fourth development plan, which was from 1980 to 1985 was in consonance with the third development plan and retained the strain on heavy industries. At this period, there was a global economic recession which ignited a sharp fall in foreign exchange earnings in Nigeria. Hence, the manufacturing firms which were import-dependent became unmaintainable as a result of dearth of earnings from crude oil export and most of the firms established at the period folded-up and the remaining few were producing at a very low capacity (Chete, Adeoti, Adeyinka & Ogundele, 2012). At this period, financing the existing manufacturing firms became a difficult task. Ajokuta Steel Company and Peugeot Nigeria Limited are examples of those firms affected and are yet to recover till date.

During the fourth developmental plan, it was obvious that all the developmental plans initiated to solve the problems of underdevelopment in the country through industrial development failed to achieve the set objectives. Various policy measures adopted to ameliorate the situation, such as the stabilization measures of 1982, the restrictive monetary policy and stringent exchange control measures of 1984, all proved ineffective. (Olorunfemi, Obamuyi & Adekunjo, 2013).

The structural weaknesses made the nation's economy extremely vulnerable to cyclical and random shocks, which persisted and warranted the introduction of the Structural Adjustment Programme (SAP) in 1986. According to Ojo(2010), SAP was introduced to restructure and diversify the productive base of the Nigerian economy to promote manufacturing sector productivity and reduce dependence on the oil sector and imports. In order to achieve the main

objectives of SAP, Financial reforms were introduced to deepen the Nigerian financial system (Ojo, 2010).

The major financial sector reform policies implemented were the deregulation of exchange rate and interest rate, free entry and exit into banking business. Also, the upward review of capital adequacy of banks from 2billion naira to 25 billion naira in 2004, which reduced the number of banks operating in Nigeria from 89 to 25 banks initially and presently to 22 banks, which boosted depositors' confidence in the Nigerian financial system.The resuscitation of eight dying banks with injection of 620 billion naira in 2009, which resulted in the removal of the banks top executive directors by the Central Bank of Nigeria, following the global financial crisis. Other related policies implemented are; the establishment of the Nigerian Deposit Insurance Corporation (NDIC), strengthening the regulatory and supervisory institutions, introduction of indirect monetary policy instruments and capital market deregulation (Ojo, 2010; CBN, 2017).

The reforms were introduced to liberalize the financial sector in order to broaden and deepen the financial system to stimulate a diversified, resilient and dependable banking industry and capital market in the country and thereby, increasing their ability to support the real sector to enable manufacturing firm access the required funds to finance production.

The manufacturing sub-sector was targeted to benefit immensely from these reforms but it seems that manufacturing firms in Nigeria are still underperforming. It is saddening that despite several financial deepening strategies un-dertaken, the country appears to have failed to achieve industrial development. The several policies and financial deepening strategies adoptedby successful governments to turn around the manufacturing sub-sector seems to have been unsuccessful as the sectorial contribution of the sector to gross domestic product has remained very low and insignificant (Ewetan & Ike, 2014).For instance, the average contribution of the manufacturing sector to the Gross Domestic Product from 1970 to 1980 was 8.2%. It increased

slightly to 9.3% in 1990 and from 1991 to 2000, it fell to 7.4% and further decline to 6.4% from 2001 to 2010 and between 2011 and 2015, it rose to 8.7%. From 2015 to 2017, it fell to 6.82% (CBN, 2015& 2017).

The Nigerian financial sector has been substantially liberalized and monetary control mechanism has shifted towards a more market-oriented regime, designed to deepen the financial system and facilitate savings mobilization and efficiency in the allocation of financial resources. The reforms are to establish the necessary macroeconomic framework and ideal environment for the real economic activities to grow unhindered.

Therefore, it is thus expected that a deepened financial system would have a significant positive effect on the performance of the manufacturing firm. Several researchers have provided proofs that development in the financial system plays a fundamental role in the economic growth of countries, (Ugbaje & Ugbaje, 2014; Garba, 2014; Emeka & Aham, 2013).

With the major financial sector reform policies implemented, the level of financial deepening has been greatly enhanced in Nigeria (Nzotta & Okereke, 2009). Financial sector depth is usually measured by two basic quantitative indicators: “monetization ratio” and “intermediation ratio”. Whereas monetization ratio includes money-based indicators like money supply ratio to gross domestic product, intermediation ratio consist of indicators concerning the bank-based measures like private sector credit ratio to gross domestic product and capital market-based measures such as market capitalization ratio to gross domestic product (Ndebbio, 2004).

Despite the abundant natural and human resources, Nigeria has failed to achieve industrial development, due largely to the low level of manufacturing sector productivity. The history of industrial development and manufacturing sector performance in Nigeria is a classic illustration of how a nation could neglect a vital sector through policy inconsistencies and financial system maladaptation (Ojo, 2010). The neglect could be seen in the comatose state of Peugeot Nigeria

Limited and Ajaokuta Steel Company Limited established in 1972 and 1979 respectively for vehicles and steel production that are critical to the diversification of the Nigerian economy into an industrial one.

A review of the manufacturing sector in Nigeria indicated that the sector has been performing below capacity,leading to decline in index of manufacturing production, average capacity utilization and contributions of the sector to Gross Domestic Product (GDP). Thus, it is crystal clear that the manufacturing sector is experiencing enormous challenges contributing just about 5%, 9%, 6%, 9% and 8.8% to the Gross Domestic Product (GDP) in 1960, 1986, 2000, 2016 and 2017 respectively (NBS, 2018).

It is disturbing to note that industries are closing down and many small scale firms have closed up shop. The performance of the manufacturing sector has been declining, with Nigeria importing almost every vital household needs. Specifically, between 2000 and 2017, over 900 manufacturing industries in Nigeria either shut down or temporarily halted production while the average capacity utilization in the manufacturing sector fell from about 79% in 1979 to about 56% in 2010, and to 54.5% in 2017 (The Finder, 2018).

As a result of the foregoing, it should be obvious that an endgame of some sort is here with us, except the manufacturing sector performance is greatly enhanced, with a focus on the secondary sector by the government. The situation has caused massive job lost, fueling the already high unemployment rate in Nigeria. If the problem is not addressed urgently, it will threaten the foundation of the country transformation agenda.

Based on the foregoing, it is therefore necessary to investigate if financial deepening has impacted on the performance of manufacturing firms in Nigeria, especially at this critical period when the Government is making frantic efforts to reposition the financial system in Nigeria and diversify the economy.

1.2 Statement of the problem

Nigeria is viewed as a technologically backward and a developing country. The nation depends on import for almost all finished goods consumed in the country, which has continually triggered sharp increase in exchange rate, thereby worsening the economic situation in the country. Ojo (2010) asserts that one of the major reasons Nigeria economy degenerated to its present level is the precarious state of her manufacturing firms, caused by neglect of the sector over the years due to over-dependence on crude oil as the major source of foreign exchange.

The contribution of the secondary sector (manufacturing, building and construction) to total Gross Domestic Product (GDP) has been relatively weak when compared to the other sectors of the Nigerian economy. Its average contribution to GDP between 1981 and 2013 was 5.85 per cent, with a minimum and maximum contribution to GDP of 4.72 and 8.74 per cent in 1998 and 1982 respectively (Oduyemi, 2013). Also, its contribution to GDP between 2014 and 2017 on the average was 6.82 percent (CBN, 2017).

Generally, financial experts and economists accorded great importance to the role of financial sector in the development of new markets and as catalyst for industrialization and economic growth (Gerschenkron, 1962, Ighosewe & Akpokerere, 2015). It is thus expected that financial deepening plays an important role in determining the growth of an economy. It should broaden its resources base, raises the capital needed to stimulate investment through savings and credit and boosting the overall manufacturing sector performance. Hence, an improvement in the financial system of a country should have positive effect on the performance of its manufacturing firms.

The vast majority of literature on financial deepening in Nigeria focused on its effect on economic growth. Many of the available fewstudies on financial deepening and manufacturingfirm performance in Nigeria, proxied financial deepening with monetization ratio and bank-based

measures only (Olanrewaju, Aremo & Aiyegbusi, 2015; Luqman, 2014; Sulaiman & Azziz, 2012; Nzotta & Okereke, 2009, and Agu & Chukwu, 2008). The capital market-based measures were rarely applied on manufacturing sector performance in the Nigerian context. The very few that applied capital market indicators either studied financial deepening and economic growth or used static model analytical techniques different from dynamic Auto- Regressive Distributed Lag (ARDL) model utilized for this study.

However, Huang (2005), Ibenta (2005), Ojo (2005) and Okaro (2002), emphasized the significant roles of capital market in financing long-term productivity for growth and development. Manufacturing sector requires and thrive better with long-term financing usually sourced from the capital market. Hence, to the best of knowledge, this study is a pioneering effort in combining the two strands of intermediation ratio (bank and capital market based indicators) and monetization ratio to measure the effect of financial deepening on manufacturing sector performance using ARDL analytical technique in Nigeria.

The use of static models, which allowed for only a contemporaneous relationship between variables, so that a change in one or more of the explanatory variables at time t causes an instant change in the dependent variable at time t, may not be appropriate for financial deepening. Therefore, dynamic models, where the current value of dependent variable depends on its previous values, or on previous and current values of one or more of the explanatory variables, should be formulated for financial deepening and manufacturing sector performance relationship. Therefore, ARDL analytical approach is employed for this study. According to Pesaran, Shin and Smith (2001), the ARDL approach has the ability to capture dynamic adjustment from initial equilibrium to a new equilibrium, while estimating the short run and long run relationship among the variables in the model. Besides, the technique has the capacity to correct the endogenueity problem among time series data.

Besides, most of the previous studies employed a single performance indicator for manufacturing firms with the exception of Bayyurt and Sagbansua (2007), who applied three performance indicators for manufacturing firms in Turkey. However, Robertson (1997), Kaplan and Norton (1996) recognized that a single measure of performance could not provide a clear concentration on the critical mission of an establishment. Consequently, a single performance indicator used by previous studies might be insufficient in assessing manufacturing firms performance. Therefore, this study deviated from the trend with the use of three variables as proxies for manufacturing sector performance in Nigeria.

Finally, many of the previous studies on causality between financial deepening and manufacturing sector performance employed Granger Causality framework which is static in nature and inadequate to establish the direction of causality on the dynamic relationship between financial deepening and manufacturing sector performance. Ibrahim and Shuaibu (2013), as well as Agu and Chukwu (2008), applied Toda-Yamamoto test procedure, but they limited financial deepening proxies to bank-based variables. Karimo and Ogbonna (2016) applied it to study financial deepening and economic growth. This study therefore used Toda-Yamamoto test procedure to unravel the causal link between financial deepening and manufacturing sector performance in Nigeria.

1.3 Objectives of the study

The broad objective of this study is to examine the effect of financial deepening on the performance of manufacturing sector in Nigeria. The specific objectives are to;

i. Determine the effects of broad money supply, private sector credit and market capitalization on the average capacity utilization of the manufacturing sector in Nigeria.

ii. Examine the effects of broad money supply, private sector credit and market capitalization on the index of manufacturing sector production in Nigeria.

iii. Evaluate the effects of broad money supply, private sector credit and market capitalization on the contributions of manufacturing sector to Gross Domestic Product (GDP) in Nigeria.

iv. Ascertain the causal link amongbroad money supply, private sector credit, market capitalization and manufacturing sector capacity utilization in Nigeria.

1.4 Research questions

The following research questions were addressed in this study:

i. How have broad money supply, private sector credit and market capitalizationaffected the average capacity utilization of the manufacturing sector in Nigeria?

ii. To what extent have broad money supplied, private sector credit and market capitalization affected the index of manufacturing sector productivity in Nigeria?

iii. How have broad money supply, private sector credit and market capitalization affected on the contribution of manufacturing sector to GDP in Nigeria?

iv. To what degree have broad money supply, private sector credit and market capitalization causally related to manufacturing sector capacity utilization in Nigeria?

1.5 Research hypotheses

This study tested the following null hypotheses, whose formulations were informed by the research questions.

i. Broad money supply, private sector credit and market capitalization have no significant effect on the average capacity utilization of manufacturing sector in Nigeria.

ii. The effect of broad money supply, private sector credit and market capitalization on the index of manufacturing sector production in Nigeria is not significantly positive.

iii. Broad money supply, private sector credit and market capitalization have no significant positive effect on the contributions of manufacturing sector to GDP in Nigeria.

iv. There isno significant causal relationship between broad money supply, private sector credit, market capitalization and the manufacturing sector capacity utilization in Nigeria.

1.6 Significance of the study

The significance of this study can be viewed from the multidimensional effect expected from financial deepening on manufacturing firms and on the economy as a whole. Manufacturing industry has the largest multiplier effect among all sectors of the economy and the economic strength of any country is usually measured by the development of the manufacturing sector.

Therefore, it is expected that the study will provide a ray of light to the government and financial regulators, owners of manufacturing firms, researchers and the general public.

- **Government and regulatory institutions**

  This study will provide a thorough understanding to the governments on development of financial system which will enable it ensure that the Nigerian financial system is appropriately deepened so as to develop appraisal techniques, information gathering and sharing mechanisms, which would enable banks and capital markets finance activities of manufacturing firms for growth and development.

  Besides, findings from this study will also provide more evidences which would enhance the effective control of the Nigerian financial system by enabling the policy makers predict,

direct, reshuffle and substitute any unproductive financial deepening strategy, thereby creating a high-quality manufacturing sector to develop national wealth and power.

- **Workers and Owners of manufacturing firms**

  This study will show the level of contribution of financial deepening to manufacturing sector performance, it will in turn assist them to identify and implement financial policies that will promote their performance. This will enable the workers to keep their jobs and will enhance the wealth maximization of the owners.

- **Researchers and the general public**

  The study will reveal the intricate relationship between financial deepening and the manufacturing sector performance to the general public. It will show the government efforts in promoting manufacturing sufficiency in the nation. Also, it will advance the frontiers of knowledge in the literature and thereby serve as a reference for further study.

- **Investment Analyst and Investors**

  The findings of the study would benefit the investment analysts and investors in examining the effectiveness of a deepened financial system on the manufacturing sector and as such, they would be in a better position to evaluate the option available for accessing short-term, long-term and non-debt financial capital as against the use of debt for financing manufacturing firms' productivity.

1.7 Scope of the study

The study covers all manufacturing firms listed on the Nigerian Stock Exchange for a period of 32years, from 1986 to2017 in Nigeria. The choice of the period is considered because Nigeria's experience in undertaking the major financial reform strategies to deepen the financial system started in 1986. Besides, the period captured the Structural Adjustment Program (SAP) introduced in 1986 to restructure and diversity the productive base of the Nigerian economy to promote manufacturing sector productivity in order to reduce dependence on the oil sector and imports.

Financial deepening is measured by broad money supply deflated by GDP (which represented the monetization ratio), ratio of private sector credit to GDP (which represented the bank-based financial deepening index) and market capitalization deflated by GDP (Which accounted for the capital market financial deepening indicator).

Finally, the study adopted three variables framework of manufacturing sector capacity utilization, manufacturing sector production and the contributions of manufacturing sector to GDP, to measure the performance of manufacturing sector in Nigeria.

1.8 Limitations of the study

This study is constrained in the following ways:

1. The study applied secondary data and as such, the researcher did not take into consideration or control error associated with data used.
2. The data adopted were restricted to the Nigeria economy and hence, generalization of the outcome to other nations might not be appropriate.
3. The assumptions and limitations associated with Autoregressive distributive lag (ARDL) model estimation methodology were presupposed.

1.9 Operational Definition of terms

- **Financial deepening**

  Financial deepening refers to expansion in the provision of financial services by financial intermediaries with a wider choice of services targeted toward the development of all areas of the society. It can also be described as an increase in the supply of financial assets in the economy. For the purpose of this study, financial deepening is operationalized by using ratio of broad money supply to GDP, ratio of private sector credit to GDP and ratio of market capitalization to GDP.

- **Financial intermediaries**

Financial intermediaries are institutions in the financial sector that are responsible for mobilizing fund from the surplus economic unit to the deficit economic unit for the purpose of productive investment. They act as the middle link between savers with surplus fund and borrowers with shortage of fund in the process of financial intermediation. For the purpose of this study, financial intermediaries are banks and capital markets.

- **Financial market**

  This is a market for trading financial assets. The financial market is a component of the financial system of a country. The market is made up of the money market ad capital market. The money market is the market where short term financial assets are traded while long term financial assets are traded in the capital market

- **Manufacturing sector performance**

The performance of the manufacturing sector refers to the effectiveness of the sector relative to its contribution to the growth of an economy. Some studies have measured manufacturing performance using various proxies. This study examines performance of the manufacturing sector in terms of its contributions to total output growth, capacity utilization and index of manufacturing production in Nigeria.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

2.1 Conceptual review

2.1.1 Financial Deepening

Fisher (2001), defines financial deepening as an increase in financial resource mobilization by the formal financial sector and the ease in liquidity constraints, leading to availability and enlargement of funds to finance projects.

Financial deepening is the increased provision of financial services with a wider choice of services geared to all levels of society (Ohwofasa &Aiyedogbon, 2013). It also refers to the macro effects of financial reforms on the larger economy.Financial deepening generally means an increased ratio of money supply to Gross Domestic Product (GDP),enhanced with credit facility to the private and enlarged capital market depth to stimulate capital formation. It refers to liquid money; the more liquid money is available in an economy, the more opportunities exist to enhance manufacturing sector productivity and continued economic growth (Ojo, 2010).

The World Bank (1989) defines financial deepening as an increase in the stock of asset. Shaw and McKinnon (1973) define financial deepening as the improvement or increase in the pool of financial services that are tailored to all the levels in the society. It also refers to the increase in the ratio of money supply to Gross Domestic Products or price index which ultimately postulates that the more liquid money is available in the economy, the more opportunities exist in that economy for continued and sustainable growth. It basically supports the view that development in financial sectors leads to development of the economy as a whole (Nnanna & Dogo, 1999; Nzotta, 2004; Ojo, 2010).

Financial deepening is a multi-faceted process that involves the interaction of a number of markets (primary, secondary and retail), instruments (deposits, loans, foreign exchange, bonds and debt securities) and stakeholders (banks, contractual savings institutions, companies). It can be defined as a process in which institutions and financial markets facilitate goods and services exchange (e.g. payment services), mobilize and pool savings of a large number of investors, acquire and process information about the companies and the potential investment projects and therefore allocating public savings to the most productive uses, follow investments and exert corporate governance, and diversify and reduce liquidity risk and inter-temporal risk (Levine, 2005; King & Levine, 1993).

Conceptually, financial deepening is often understood to mean that; sectors and agents are able to use a range of financial markets for savings and investment decisions, including at long maturities (access); financial intermediaries and markets are able to deploy larger volumes of capital and handle larger turnover, without necessitating large corresponding movements in asset prices (market liquidity); and the financial sector can create a broad menu of assets for risk-sharing purposes (hedging or diversification). In other words, deep markets allow savers to invest in a broad range of quality investment and risk- sharing instruments and allow borrowers to likewise tap a broad range of financing and risk management instruments (Goswami & Sharma, 2011).

Patrick (1966) as reported in Ojo (2010), asserts that the greater the degree of financial development, the wider the availability of financial services that allows for diversification of financing risk. This increases the long run growth trajectory of a country and ultimately improves the welfare and prosperity of citizens to have access to financial services

Financial deepening could also be said to be the ability of financial institutions to effectively mobilize savings for investment purposes. The growth of domestic savings provides the real structure for the creation of diversified financial claims. It also presupposes active operations

of financial institutions in the financial markets, which in turn entail the supply of quality (financial) instruments and financial services (Ndekwu, 1998). According toNnanna and Dogo (1999), financial deepening represents a system free from financial repression. According to Fry (1988), financial repression is an indiscriminate distortion of financial prices, including foreign exchange rates and interest rates, which reduces the real size of the financial system relative to non-financial magnitudes and the real rates of growth. Financial deepening generally entails an increased ratio of money supply to Gross Domestic product (Popiel, 1990; Nnanna & Dogo, 1999; Nzotta, 2004).

Increase in the ratio of money supply in an economy can play an important role in reducing risk and vulnerability for disadvantaged groups, and increasing the ability of individuals and households to access basic services like health and education, thus having a more direct impact on poverty reduction. More opportunities exist for continued growth with the availability of more liquid money.

Financial deepening is usually measured by two basic quantitative indicators; 'monetization ratio' and 'intermediation ratio'. **Monetization ratio** includes money-based indicators such as the ratio of broad money supply to GDP (M_2/GDP) while **intermediation ratio** consists of indicators concerning the **bank-based** *measures* like bank credit to the private sector (CPS/GDP) and ***capital market-based measures*** such as stock market capitalization (Ndebbio, 2004).

In various studies, financial deepening has been measured using several indicators. For instance, the ratios M_1/GDP, M_2/GDP, M_3/GDP and market capitalization/GDP were employed to measure the depth of the financial sector (King & Levine, 1993). The activity of the financial sector has also been a proxy for financial deepening, using indicators such as credit to the private sector/GDP and/or value traded ratio. Several studies however, have made used of different

combinations of these indicators to measure the development of the financial system in different countries (Huang, 2005).

Therefore, financial sector deepening enable the financial intermediaries perform their functions of mobilizing, pooling and channelling domestic savings into productive capital more effectively thereby contributing to economic growth of a country. In addition to mobilizing savings and improving capital allocation (Boyd & Prescott, 1986), financial deepening reduces the extent and significance of information asymmetries (Stiglitz & Greenwald, 2003) and allows for risk transformation and monitoring (Diamond, 1984).

Hence, a deepened financial system broadens the economy for effective intermediation, process, which could produce enhanced manufacturing performance.

2.1.2 Financial intermediation

Financial intermediation is the process of mobilization and allocation of funds from the surplus to the deficit sectors of the economy (Nwakoby & Ananwude, 2016). Significant roles in intermediation are carried out by financial market, banks and non-bank financial intermediaries. Financial intermediaries play an important role in credit markets because they reduce the cost of channeling funds from relatively uninformed depositors to users that are information-intensive and difficult to evaluate, leading to a more efficient allocation of resources. Intermediaries specialize in collecting information, providing funds, evaluating projects, monitoring borrowers' performance and risk sharing (Adeola, 2005).

Despite this specialization, the existence of financial intermediaries does not replicate the credit market outcomes that would occur under a full information environment. The existence of imperfect, asymmetrically-held information causes frictions in the credit market. Changes to the

information structure and to variables which may be used to overcome credit frictions, such as firm collateral and equity will in turn cause the nature and degree of credit imperfections to alter.

Banks, financial markets and other intermediaries are 'special' where they provide credit to borrowers on terms which those borrowers would not otherwise be able to obtain. Because of the existence of economies of scale in loan markets, small manufacturing firms in particular may have difficulties obtaining funding from non-bank sources and so are more reliant on bank lending than other firms. Adverse shocks to the information structure, or to these firms' collateral or equity levels, or to banks' ability to lend, may all impact on manufacturing firms' access to credit and hence to investment and manufacturing sector output..

Current theories of the economic role of financial intermediaries build on the economics of imperfect information that began to emerge during the 1970s with the contributions of Spence (1973), Rothschild and Stiglitz (1976). Financial intermediaries exist because they can reduce information and transaction costs that arise from an information asymmetry between borrowers and lenders. Financial intermediaries thus assist the efficient functioning of markets, and any factors that affect the amount of credit channeled through financial intermediaries can have significant macroeconomic effects.

There are two strands in the literature that formally explain the existence of financial intermediaries. The first strand emphasises financial intermediaries' provision of liquidity. The second strand focuses on financial intermediaries' ability to transform the risk characteristics of assets. In both cases, financial intermediation can reduce the cost of channeling funds between borrowers and lenders, leading to a more efficient allocation of resources.

Diamond and Dybvig (1983) analyse the provision of liquidity (the transformation of illiquid assets into liquid liabilities) by banks. In Diamond and Dybvig's model, ex ante identical investors (depositors) are risk averse and uncertain about the timing of their future consumption

needs. Without an intermediary, all investors are locked into illiquid long-term investments that yield high payoffs only to those who consume late. Those who must consume early receive low payoffs because early consumption requires premature liquidation of long-term investments. Banks can improve on a competitive market by providing better risk sharing among agents who need to consume at different (random) times. An intermediary promising investors a higher payoff for early consumption and a lower payoff for late consumption relative to the non-intermediated case enhances risk sharing and welfare.

The optimal insurance contract in Diamond and Dybvig's model is a demand deposit contract, but it has an undesirable equilibrium (bank run), in which all depositors panic and withdraw immediately, including even those who would prefer to leave their deposits in the bank if they were not concerned about the bank failing. Bank runs cause real economic problems because even "healthy" banks can fail, leading to a recall of loans and the termination of productive investment.

In Diamond and Dybvig (1983), the illiquidity of assets provides both the rationale for the existence of banks and for their vulnerability to runs. A bank run is caused by a shift in expectations. When normal volumes of withdrawals are known and not stochastic, suspension of convertibility of deposits will allow banks both to prevent bank runs and to provide optimal risk sharing by converting illiquid assets into liquid liabilities. In the more general case (with stochastic withdrawals), deposit insurance can rule out runs without reducing the ability of banks to transform assets.

Financial intermediaries are able to transform the risk characteristics of assets because they can overcome a market failure and resolve an information asymmetry problem. Information asymmetry in credit markets arises because borrowers generally know more about their investment projects than lenders do. The information asymmetry can occur 'ex ante' or 'ex post'. An 'ex ante'

information asymmetry arises when lenders cannot differentiate between borrowers with different credit risks before providing loans and leads to an adverse selection problem. Adverse selection problems arise when an increase in interest rates leaves a more risky pool of borrowers in the market for funds. Financial intermediaries are then more likely to be lending to high-risk borrowers, because those who are willing to pay high interest rates will, on average, bear worse risks (Ojo, 2010).

The information asymmetry problem occurs 'ex post' when only borrowers, but not lenders, can observe actual returns after project completion. This leads to a moral hazard problem. Moral hazard arises when a borrower engages in activities that reduce the likelihood of a loan being repaid. An example of moral hazard is when firms' owners "siphon off" funds (legally or illegally) to themselves or to associates, for example, through loss-making contracts signed with associated firms (Ojo, 2010).

The problem with imperfect information is that information is a 'public good'. If costly privately-produced information can subsequently be used at less cost by other agents, there will be inadequate motivation to invest in the publicly optimal quantity of information (Hill, 2013). The implication for financial intermediaries is as follows. Once banks obtain information they must be able to signal their information advantage to lenders without giving away their information advantage. One reason, financial intermediaries can obtain information at a lower cost than individual lenders is that financial intermediation avoids duplication of the production of information. Moreover, there are increasing returns to scale to financial intermediation. Financial intermediaries develop special skills in evaluating prospective borrowers and investment projects. They can also exploit cross-sectional (across customers) information and re-use information over time.

Leland and Pyle (1977) formally show that a bank can communicate information to investors about potential borrowers at a lower cost than can individual borrowers. They focus on an ex ante information asymmetry, where entrepreneurs selling shares to the market know the expected returns of their own investment, but other agents find this information costly to observe. This results in a moral hazard problem since firms with low expected returns have an incentive to claim a high expected return so as to increase their market valuation. In Leland and Pyle's model, intermediaries can solve this moral hazard problem by monitoring the actions of firms. The implication of this theory is that strong financial system is needed to provide credit for manufacturing sector to thrive. Repressed and weak financial system is unlikely to give support for optimum manufacturing sector production.

2.1.3 **Financial repression**

Financial repression is negative impact of imposition of controls on financial development and structure. Financial repression hypothesis therefore argues strongly in favour of reliance on market forces. The theoretical arguments therefore centre on the need for a more *laissez faire* financial policy, especially the freeing of domestic financial markets to allow interest rates to reflect the true and actual scarcity of capital and investable firms in developing nations and the deregulation of foreign exchange markets.

The hypothesis is associated with the works of Mackinnon (1973) and Shaw (1973). They produce a theoretical basis for financial deepening that has been formalized and extended to show how some financial controls that produce financial repression effects could make the financial sector stifle rather than promote a country's growth and development.

Mackinnon (1973) analysis, which leads to a critique of prevailing monetary theory suggests that interest rate ceiling (especially without taking into account inflation rate) create a

repressed level of private savings. It is therefore assumed that private savings is very sensitive to the real returns on financial and physical assets and their stability.

Similarly, Shaw (1973) explains that the financial sector of a nation does matter in economic development, and that it can assist in the breakaway from plodding repetition of repressed economic performance to rapid growth.

McKinnon (1973) and Shaw (1973) attributed financial repression as the cause of the unsatisfactory growth performance of developing countries. The duo 'McKinnon and Shaw' advocated that financial liberalization was needed to remedy the problems caused by the financial repressive policies of developing countries. According to their argument, a repressed financial sector discourages both saving and investment because the rates of return are lower than what could be obtained in a competitive market. By discouraging saving, financial repression results in an inadequate amount of mobilized savings, which has to be rationed in an inefficient manner to a small group of favoured borrowers. Therefore, interventions by monetary authorities in the money and capital markets usually have the effect of distorting the flow of credits as well as indirectly encouraging the apparent excessive risk aversion of financial intermediaries in developing nations (Ojo, 2010). In such a system, financial intermediaries do not function at their full capacity and fail to channel saving into investment efficiently, thereby impeding the development of the overall economic system. Therefore, market forces and financial deepening could produce an optimum financial structure and an efficient mobilization of savings and credit allocation.It posits therefore that the Liberalization of these countries from their repressive conditions would induce savings, investment for manufacturing sector productivity and economic growth. The theory implies that in a repressed financial system, manufacturing sector productivity would be negatively affected and growth would be hindered.

A general criticism that has been levelled against this theory is that its view on the role of institutions is negative. Their view of the role of institutions, it is argued, conflicts with what goes on in any real economy where markets work through a whole network of institutions. Inclusive in these institutions are trade unions, firms, and the state which play a crucial role in collecting information and reducing uncertainty (Graham, 1996). Besides with full acknowledgement of the merits in the technique of financial deepening and financial liberalization, there seems to be a need for some form of financial regulation and control in view of the imperfect financial market situation and the important role of government in encouraging developmental efforts in many developing nations.

2.1.4 Financial liberalization

Financial Liberalization refers to the process where the financial sector of a country is made opened with an aim to create favourable environment to increase the money demand in the economy. The term financial liberalisation is used to cover a whole set of measures, such as the autonomy of the Central Bank from the Government; the complete freedom of finance to move into and out of the economy, that is, the full convertibility of the currency; the abandonment of all 'priority sector' lending targets; an end to government-imposed differential interest rate schemes; the complete freedom of banks to pursue profits unhindered by government directives; a freeing of interest rates; the removal of restrictions on the ownership of banks, which means de-nationalisation, full freedom for foreign ownership, and an end to 'voting caps'; and so on (Prabhat, 2011). Financial Liberalization takes place by increasing the financial resources to lead the supply-induced demand for money and by creating suitable environment to make investments in the economy.

The theory of financial liberalization pioneered by McKinnon (1973) and Shaw (1973), advocates for the liberalization of the financial sector as an effective way to accelerate growth. The theory suggests that the liberalization of financial markets allows financial deepening which reflects an increasing use of financial intermediation by savers and investors as well as the monetization of the economy. In other words, by lowering financial market frictions, domestic savings are increased and foreign capital is attracted.

The theory is based on the premise that the higher the real rate of interest, the greater the degree of financial deepening, the more saving there will be, and financial saving will be allocated and invested more efficiently than if saving is invested directly in the sector in which it takes place, without financial intermediation (Thirlwall, 2005). The McKinnon-Shaw theory of financial liberalization suggests a complementarity relationship between the accumulation of money balances (financial assets) and physical capital accumulation for enhanced manufacturing sector productivity in developing countries, leading to economic growth.

2.1.5 The market-led financial industry cluster

The growth-led finance theory states that a high economic growth may create demand for certain financial instruments and arrangements and the financial markets are effectively responding to these demands and changes. In other words, this hypothesis suggests a "demand following" relationship between financial and economic developments.

The Demand-Following theory holds that with enhanced manufacturing sector performance and economic growth, all the economic sectors of society inevitably increase the demand for the financial services, which will lead to further expansion of the financial system. The market-led model (also known as the natural evolution type) is a path adapted to the Demand-Following theory, and it considers the formation and development of the financial industry cluster

as the inevitable requirement of production, exchange and economic development (Ogwumike & Salisu, 2012). Due to the development and growth of the real economy, especially, the manufacturing sub-sector, there is a growing demand for the financial services. Due to this demand, the financial institution would form a cluster in one place. It can promote the innovation of financial instruments, the well-development of financial markets, the abundance of financial information, and the soundness of financial laws and regulations, ultimately can prompt the formation of financial industry cluster in the region.

Once the initial regional advantages have been formed, the financial industry cluster would form a correlation effect through the financial industry to consolidate the effect of financial industry cluster and enhance the stability and scale of the cluster (Fujita, Krugman, & Venables, 1999). Therefore, the financial industry cluster is not formed overnight; it experiences the process of gathering from a single financial institution, to the services associated with financial institutions, and finally to the mature and stable financial industry cluster.

The market-led financial industry cluster generally relies on strong national economic power. If the countries' economic and trade has a high development, it will attract a lot of foreign enterprises to invest and set up the branches in these countries, and the liquidity capital will gather there. Thus, the financial markets, the financial services, and the financial institutions will be rapidly expanded, which finally formed a cluster. The corresponding financial centers of the financial industry cluster generally have a predominant location, perfect urban infrastructure (including transport, communications, etc), excellent financial professionals and other hardware and software support (Iyoboyi, 2013). Once these advantages have been formed, the stability of the cluster is bound to further be consolidated, and the attractiveness of the city and radiation effects on the surrounding area will be enhanced. For the purpose of this study, the implication of

the Growth-led finance theory is that a well developed manufacturing sector would produce a deepened financial system as a result of the competition among the financial services providers.

2.1.6 Financial reforms in Nigeria

Prior to the introduction of SAP in 1986, by the Babangida Administration, the Nigerian financial system could be described as highly regularized. Some of the regulations though occasionally desirable, contributed to the strains in the financial system (Ojo, 2010). The SAP which emphasized deregulation, to curtail government participation in the economy, made a huge transformation in the financial system. According to Ojo (2010), policy reforms such as devaluation of currency, removal of subsidies, especially on petroleum product and the disbanding of commodity boards to encourage agriculture and manufacturing sector productivity, were initiated.

The main aims of the financial sector reforms are to allocate financial resources efficiently, increasing the return on investment and to accelerate growth of the real sectors; especially, the manufacturing sub-sector for economic growth and development. (Ojo, 2010, Ezu, *et al* 2017).

In order to carry out reforms, there is always the need to identify weaknesses in the financial system thoroughly using available data to identify the weaknesses in the system. Based on the findings, appropriate reforms would be carried out to address the identified problem, especially in the banking sector and capital markets.

However, according to Ojo (2010), the financial reforms in Nigeria have been largely driven by the financial repression argument advanced by Mckinnon (1973) and Shaw (1973), characterized by low real interest rates, high reserve requirements, mandatory credit ceilings and

directed credit allocation to priority sectors. Since bank and capital market are the bedrocks of the Nigerian financial system, this study therefore considered their specific reforms.

2.1.6.1 Banking sector reforms

In Nigeria, banking business started in 1892 with the establishment of the foundation banks. Since then, the sector has passed through many decades of changing structure in phase from the pre-colonial period to the period of the nation's independence and eventually to what is known today as the Nigeria modern day banking industry.

The Nigerian banking system has undergone series of reforms due largely to globalization, technological advancement and integration into international financial market (Ezu, *et al* 2017). The reforms were to increase the size, stability and efficiency of the banking sector, geared toward enhancing its optimum performance, economic growth and development (Ezu, *et al* 2017).

However, the macroeconomic reforms introduced in 1986 also took its toll on the external value of the naira which was then believed to be overvalued. The massive depreciation that followed shot up foreign manufacturing input cost, leading to greater domestic capacity under-utilization and reduced ability of corporate borrowers to repay their loans and advances. These problems greatly impaired the quality of banks' assets which became unbearable and turned out to be huge burden on many banks. The financial intermediation role of these banks had been heavily impaired while macroeconomic activities seriously slowed down. (Ojo, 2010).Banks were subjected to substantial restrictions on their products and activities. These restriction had, to reasonable extent limited some banks' ability to adapt to changing market conditions under the new dispensation of deregulated environment.

Among these interventions and controls were credit expansion and interest rates ceiling as well as restrictions on entry into the banking industry. Another major intervention was the

restriction often placed on the bank's portfolio selection. Many of the banks were forced to perform developmental roles such as provision of subsidized credit to priority sectors and public enterprises for which some of them were ill-equipped, and therefore they suffered financial problems.

According to Balogun (2007), there are four phases of banking reforms in Nigeria; the first phase was Post-SAP of 1986 to 1993. This phase led to deregulation of the banking industry that was dominated by indigenized banks that had over 60% of federal and state governments' stakes, in addition to credit, interest rate and foreign exchange policy reforms. The second phase was the Reform Lethargy which started in the late 1993-1998, with the re-introduction of regulations and the banking sector suffered deep financial distress during this period. Consequently, another reform came up to manage the distress. The third phase is the Pre-Soludo (1994-1998)financial reforms period. The fourth phase, which was Soludo reform era, came up with the advent of civilian democracy in 1999. This phase marked the return to liberalization of the financial sectors, accompanied with the adoption of distress resolution program. This period also saw the introduction of universal banking which empowered the banks to operate in all aspect of retail banking and non-bank financial market.

In 2004, the Nigerian monetary authorities after various investigations affirmed that the financial system was characterized by structural and operational weaknesses and that led to the fourth phase known as Post-Soludo reform The Post-Soludo banking sector reform introduced consolidation and many banks were consolidated through mergers and acquisitions on July 6, 2004. This exercise made it mandatory for all Deposit Money Banks to raise their capital base from ₦2 billion to a minimum of ₦25 billion within a stipulated period and the number of Deposit Money Banks therefore reduced from 89 to 25 in 2005. The number of banks later reduced to 21as at November, 2017 (The Finder, 2018).

Also, the post-consolidation period witnessed rapid growth in the money and capital markets due to increase in liquidity in the banking industry. However, overrated profits were declared by banks in 2009 and as a result, the Central Bank of Nigeria immediately ordered an audit report on all Deposit Money Banks in the country and the result of the audit showed that most of the banks were distressed. Many banks that were thought to be financially buoyant were found to be distressed. From the findings of the audit, it became imperative to sanitize the financial institutions in order to bring about healthy evolution of the financial sector in the country.

Thereafter, the Central Bank of Nigeria crafted a blue print known as the Project Alpha Initiative to reform the Nigerian financial system. The reforms were aimed at removing the entrenched weaknesses and fragmentation of the financial system, integrating the various ad-hoc and piecemeal reforms, and unleashing the huge potential of the economy (Sanusi, 2012).

The result of the audit also showed a huge volume of non-performing loans in the banks and the Asset Management Corporation of Nigeria (AMCON) was therefore established in 2010, to address the problem of non-performing loans in the Nigerian banking industry. In 2011, the Asset Management Corporation of Nigeria (AMCON) acquired from the Nigerian Deposit Insurance Corporation (NDIC) three Bridge Banks, namely Mainstreet Bank, Keystone Bank and Enterprise Bank to assume the assets of former Afribank, Bank PHB and Spring bank respectively to meet the minimum ₦25billion and the minimum capital adequacy ratio of 15%. Consequently, AMCON injected ₦679billion into the Bridge Banks (The Finder, 2018).

2.1.6.2 Financial market reforms

Financial markets provide the facilities and variety of instruments which facilitate the process of financial intermediation in the economy(Ibenta, 2005). A well-functioning financial market is necessary for the attainment of macroeconomic objectives. Efficient financial markets improve the

demand for money and, therefore the process of physical capital accumulation. Sound and efficient financial markets facilitate enhanced manufacturing sector productivity. Stable and well-functioning money and capital markets increase the proportion of savings channeled to investments and the marginal productivity of capital.

According to Okaro(2002), the need for a very vibrant capital market in Nigeria, as a source of Long - term financing for economic growth and development is accentuated by the need for alternative sources of long-term finance, given the nation foreign debt burden, which has hampered further international borrowing.

2.1.6.2.1 Nigerian capital market specific reforms

The Nigerian Capital Market has evolved having undergone several reforms over the years. Before 1959, almost all formal savings and deposits in Nigeria were in the banking system. The country's major capital balances were invested on the London Stock Exchange usually via London-based stockbrokers. The Nigerian capital market effectively came into being with the establishment of the Lagos Stock Exchange in 1960, which began actual trading in 1961. The NSE was incorporated under the Companies' Ordinance as an association, limited by shares initially, but became a company limited by guarantee in 1990. It received initial financial support from the CBN through an annual subvention. The Lagos Stock Exchange's name was changed to the Nigerian Stock Exchange (NSE) in 1977 following recommendations by the Government Financial System Review Committee of 1976. In addition to the Lagosbourse (by far the preponderant stage for trading activity) the NSE opened trading floors in Port Harcourt and Kaduna in 1980 and has since added Kano, Yola, Calabar, Ilorin, Uyo, the latest being the Abeokuta branch commissioned in November 2008.Some specific reforms have been carried out

on the NSE over the years to make the exchange more efficient. Some of the developments in the NSE are identified in Store (2004), Alabede (2005) and SEC (2005) as follows:

• **Automated Trading System (ATS)** – this is one of the most outstanding innovations in the securities market in Nigeria. The ATS is a system of security trading arrangement whereby transactions are conducted through a network of computers. Before ATS was introduced, the call over system was used and this system made the settlement cycle on the NSE to be 21 days. ATS was launched on the 27th of April, 1999.

• **Central Securities Clearing System (CSCS)** – The NSE commissioned the CSCS in 1997 as a subsidiary but it came into operation on the 14th of April, 1999. According to the Securities and Exchange Commission (SEC, 2005), the CSCS was conceived as primarily a settlement arena for the achievement of the T-3 settlement cycle. The CSCS serves as an interface with the ATS and automatically receives data relating to trade as they take place for settlement.

• **On-line Trading** - The NSE has been able to link some of its branches that have large daily transactions to the central server at the Customs House, Lagos, Abuja, Kano, Yola, and Port Harcourt. Branches are now fully integrated to the main trading platform. Stockbrokers residing in these areas do not have to be in the Lagos trading floor to trade anymore.

• **Remote Trading** – As part of the reform in the NSE, in order to make it efficient, in 2004, the exchange introduced remote trading. Remote trading is a system where brokers trade from the comfort of their offices. The computers of the stockbrokers are connected to the main trading machines through one of the safest connection devices. This system guarantees safe delivery of data from the mainframe of the trading machine to the computers in the office of stockbrokers. The objective of this system is to eliminate the formal trading floor.

• **The Trade Alert** – This was introduced in 2005 and generated a lot of controversy. This system wasintroduced as a means of protecting the securities market against ever increasing threats from

fraudsters.The trade alert is a device which, when subscribed to by a security holder, will send a notice to thesecurity holder's mobile phone indicating elaborately all transactions taking place in his accounts in theCSCS. The aim of this device is o stop any unauthorized trade, before it takes place thereby protectingthe investment.

• **E-bonus** – The e-Bonus was put in place to ensure bonuses issued to an investor by companies areinstantly credited to the investors' accounts at the CSCS.

• **E-IPO** – This system ensures that the Initial Public Offer of listed companies areelectronicallycaptured on the accounts of the CSCS. After the closure of the offer and allotment by the company,lists of the successful investors would be forwarded to the CSCS for retention in the depository. Thissystem will eliminate the long waiting period which the registrar hitherto took to print and distributescertificates.

However, the trend of financial deepening indexes did not experience any dramatic change during the period of study from 1986 to 2017. This is despite the various financial reforms introduced from 1986 which should have led to a more deepened financial system. Although the reforms led to an increase in the number of financial institutions especially banks, but the institutions could not sustain the high level of intermediation in the system for long. Low market capitalization in the capital market with the presence of weak and terminally distressed banks, especially in the late 1990 up to 2009, accounted for the low level of financial deepening indices during the study period (1986-2017).

2.1.7 **Financial system maladaptation**

The major reasons for the difficulties in accessing credit and the poor state of manufacturing firms in Nigeria could be due to financial system misalignment and maladaptation. According to Ojo, (2010), a financial system could be said to be a maladapted type when its

institutional structure, orientation, culture, and modes of operation of its main actors are mainly transplanted type and not appropriately adapted and oriented to suit local structural and economic peculiarities, as well as not being made relevant to the developmental needs of the local economy concerned.

2.1.7.1 **Manifestation of the maladapted financial system**

Ojo (2010) listed the manifestation of the maladapted financial system as follows:

i. Having institutions with practices that are alien and not fashioned to effectively serve the peculiar needs and requirements of the local areas and people concerned.

ii. Failure to put in place an appropriately designed strategies to provide required financial services for micro, small and medium enterprises and other manufacturing firms that constitute the bulk of the economic units.

iii. Financial sector dominated by Deposit Money Banks of the Anglo-Saxon type, rather than the required industrial banking of the German type, that are well equipped and orientated to financing manufacturing sector development and other productive activities.

The manifestations of the maladapted financial system as listed by Ojo (2010), are appropriate but might not be the only militating factors against having a virile and growth inducing financial system. Apart from maladaptation, the other instruments needed for a healthy financial system to prevent the potential build-up of in-balances that could trigger financial crisis are; regulation and supervision, surveillance, market discipline, communication, and sound macroeconomic policies. Timely adjustments may also be needed both in the way vulnerabilities are assessed and in the formulation and

implementation of policy instruments, as changes occur that could adversely affect the financial system.

2.1.7.2 **Features of the maladapted financial system**

According to Ojo (2010), the major feature of a maladapted financial system is that banks, capital markets and other financial intermediaries perform their financial intermediation roles in such an inefficient way as to render them unable or unwilling to make the expected contributions to manufacturing sector productivity and economic development. Funds are inefficiently mobilized, and since the savings facilities and instruments offered by banks are not very attractive, less than the available potential savings is mobilized. The limited mobilized funds are inefficiently allocated, mainly on short-term basis to less productive activities, and those made available to some productive enterprises are usually done with high cost and terms that are very difficult for productive use (Ojo, 2010).

In such an arrangement, measures taken by the regulatory authorities to make the banks and other financial institutions change their unsatisfactory financial practices are usually not successful, due to lack of co-operation. Therefore, financial regulations and controls like sectorial guidelines and prescribed minimum and maximum interest rates on deposits and loans respectively, are usually observed in a perverted manipulative manner, and as such, the intended desired effects of financial reforms could not be achieved.

The Nigerian maladapted financial system is traceable to its Colonial past, whereby the banking system and the capital markets are patterned after those operating in Britain, without effecting the necessary adaptation to suit local developmental need. Ojo (2010) observed that the British financial system was once relevant to the then economic structure

and Empire status, failed to change for years, until about two decades past due to the harmonized European banking and financial services in line with the changing globalized world and economic/industrial realities of the time. The problem with the Nigerian financial system, patterned after the British type, could be said to be due to misalignment of a system that was transplanted here in its defective form, without the required adaptation to suit the country's less developed non-Empire status. As a consequence, we have retrogressed from middle to low income category and those with better adapted financial systems, have been advancing in manufacturing productivity as observed in some Asian countries that are not even blessed with abundant natural resources like Nigeria.

The description and assertion of Ojo (2010) on the Nigerian financial system as maladapted could be challenged with the existence of some specialized banks like the Nigerian Bank for Commerce and Industry (NBCI), the Nigerian Agricultural, Co-operative and Rural Development Bank (NACRDB), the Federal Mortgage Bank of Nigeria (FMBN) and the Nigerian Industrial Development Bank (NIDB). The banks were established by government to provide medium and long-term credit for the creation and expansion of agriculture, commercial and industrial enterprises in Nigeria. However, they are government owned banks which are not aggressive in terms of deposit mobilization, when compared to the privately owned Deposit Money Banks and Microfinance Banks that are profit oriented. They have low level of awareness and the politicization of their operations with bottlenecks and bureaucracy associated with service delivery in government owned enterprises. The establishment of the specialized banks and institutions for financing SMEs and manufacturing firms in general, seems not to have alleviated the problems of financé accessibility. Therefore, the roles of Nigerian government in establishing the banks, interest rate control and credit allocation to the productive

economic sectors, which hinders the mobilization of savings and discourages financial assets holding, capital formation and productive investment in the manufacturing sector, suggests financial system maladaptation.

2.1.8 The Nigerian manufacturing/industrial sector development

According to Alao (2006), the First National Development Plan (1962-1968) emphasized light industry and assembling activities. The second plan (1970-1975) had a slightly similar thrust and focus, but the emphasis shifted in the third plan (1975-1980) towards heavy industries. During this period, major projects were initiated in the steel and petroleum refinery sector. For the fourth plan (1980-1985), the broad direction is in consonance with the third; it retained the stress on heavy industries. But several of the pretentious plans were short-changed with the onset of the profound economic crisis in the early l980s. The participants in the Nigerian industrial and manufacturing sectors can be grouped into four, namely; Multinational, National, Regional and Local groups. Separately from the multinational operators, other participants have vanished in the last two decades, due to unreliable and unpredictable government policies and lack of basic raw materials most of which are imported. These have virtually made Nigeria a non-producing nation which depends solely on importation of her goods and services.

Alao (2006) identified and observed that the development of the Nigerian industrial policy involved two key stages as follows:

i. The first stage (1970-1985): The period covers the state-led import substitution industrialization strategy. The main focus is on the economic role of government through direct investments, administration of a protectionist trade regime, and the introduction of schemes such as indigenization and preferential credit to nurture indigenous entrepreneurs. It is argued that the roles assumed by the government, gave it a leadership role in the economy and direct control over the

welfare of individual private businesses. During this period, the strategy of government simply involved attracting and encouraging foreign capital to partake in manufacturing activities.

ii. The second stage (1986 to date): The period lays emphasis on the economic liberalization policies that replaced the state-led import substitution industrialization strategy and nationalization policy. Government's policy in this period focuses on privatization, deregulation of foreign investments, trade liberalization, deregulation of credit policy and the introduction of the Foreign Exchange Market (FEM). Privatization and deregulation has resulted in the reliance on market, rather than state regulation, and is reducing the role and power of government relative to the private sector.

2.1.9 **Financial deepening and manufacturing sector performance in Nigeria**

Generally, African countries poor economic development has been a source of worry for scholars, policy makers and international organizations (Amsden, 1985; UNIDO, 1988; Haggard, 1990; UNECA, 2006, 2012; Easterly, 2007). More importantly, Africa has lagged behind other developing regions in enhancing manufacturing sector productivity of various forms, and as a result, the continent has not been able to participate competitively in international trade - the two major drivers of long-term and sustainable economic growth (UNCTAD, 2005; Martin, 2008). Specifically, the case of Nigeria is troubling with the nation now importing several household needs that could be produced locally.

Despite the challenges of institutional efficiency on the continent (Balogun, 2007; World Bank, 1997; IMF, 1999), it must be pointed out that Nigerian economy has made significant efforts to deepen the financial system and promote manufacturing firms productivity, but her efforts have been relatively disappointing.

In an attempt to revitalize the manufacturing sub-sector in Nigeria, there have been numerous policies formulated by the Government to develop the financial system through the

implementation of several financial reforms. Successive governments in Nigeria have come up with several financial reforms to deepen the financial system in order to set the right path and stimulate the real sector, and especially the manufacturing sub-sector to thrive. For example, the country pursued the comprehensive macroeconomic policy reforms under the IMF structural adjustment programs (SAP) that were introduced in the 1980s. Informed by her desperation to attract foreign capital and to promote manufacturing firms productivity, the Nigerian governmentagreed to economic and financial market liberalization without adequate consideration for the establishment of export capacity and possible safety nets to accommodate the effects of foreign competition on the domestic markets (Ojo, 2010).

However, the trend of financial deepening indexes did not experience any dramatic change during the period of study from 1986 to 2017. This is despite the various financial reforms introduced from 1986 which should have led to a more deepened financial system. Although the reforms led to an increase in the number of financial institutions especially banks, but the institutions could not sustain the high level of intermediation in the system for long. Low market capitalization in the capital market with the presence of weak and terminally distressed banks, especially in the late 1990 up to 2009, accounted for the low level of financial deepening indices during the study period (1986-2017). Contrary to expectation, the policy culminated in crowding out most of the fledgling firms in Nigerian manufacturing sector, and the few survivors are operating below their optimal capacity (Ojo, 2010). There are evidence to suggest that the unintended negative consequences of unguided economic liberalization in the face of low manufacturing capacity, weak institutions and low safety nets that characterized almost all the countries in Africa and especially, Nigeria at the time (and even now) have contributed to the present state of underdevelopment on the continent(Stiglitz & Charlton, 2005).

To address some of the bitter lessons learnt through the SAP programme, different Nigeria governments have been particularly diligent in deepening the financial system by reforming the stock markets, and the banking sectors have undergone considerable reforms to ensure their sustainability. Further, Nigerian leaders have been undertaking reforms needed to provide favourable investment climate more than any other developing country outside of Asia, without the expected increase in the manufacturing sector performance (Ojo, 2010).

Measuring the performance of manufacturing sub-sector, Haron and Chellakumar (2012) explains that performance is a quality of any firm and it is achieved by valuable outcome such as higher productivity and can also be measured by the level of firm's efficiency.

The term productivity can be explained as the rate of real output per unit of input. It can also be defined as the relationship between production of an output and one, some, or all of the resource inputs (equipment, capital, technology and labour) employed in accomplishing the assigned task. It is also said to be a measure of efficiency, usually considered as output per person hour.

An increase in production occurs when more output is produced with less input, or with the same quantity of input, or with a little increase in input (Odior, 2013).

Generally, there are two divisions of productivity: (1) partial productivity; this is the estimate of the total output per a single input, usually, labour. (2) Total factor productivity; this is the total output per the aggregate measure of the inputs of all the factors of production employed (Odior, 2013).

The productivity of labour is usually measured either as output per man-hour or output per operator, which is either expressed as physical productivity (quantity) or as economic productivity (monetary value).

Output is usually expressed in monetary terms because of its heterogeneity. For manufacturing firms, it is better calculated from ex-factory prices of finished goods, estimated value of work-in-progress and other works and services of an industrial nature (Odior, 2013).

There are different indicators to measure the performance of manufacturing firms. This includes: index of manufacturing production, capacity utilization in the manufacturing sector, contributions of manufacturing sector to gross domestic products, manufacturing value added and employment in the manufacturing sector (Odior, 2013).

Performance of manufacturing firms can be affected by many factors such as, quality, innovation, debts, efficiency, effectiveness, some environmental situations (Luo & Park, 2001); dynamism, complexity, hostility and some other unobservable factors (Jacobson, 1990); corporate culture, access to scarce resources, management skill and luck, cash flow, current ratio, leverage, firm size, inventory turnover, machinery and equipment (Bayyurt & Sagbansua, 2007).

A well-deepened financial system should sustain and provide basis for moderate lending rates to encourage manufacturing sector productivity in any economy, unfortunately, the prime lending rates had been very high and market capitalization of the manufacturing firms had been very low. According to Ojo (1994) and Nzotta (2004), the major reasonsfor these include technical insolvency and presence of weak banks, the underdeveloped nature of the capital markets, lack of interest rate elasticity, unresponsiveness of the rates to changes in business cycle and the huge fiscal deficits by the public sector over the years in Nigeria.

As a consequence, funding challenges have made it difficult for manufacturing firms to invest in modern machines, information technology and human resources development which are critical to reducing production cost and increasing productivity. The manufacturing sub-sector continued to face challenges of accessing credit from the financial institutions, which in turn

would affect the importation of raw materials leading to poor and low manufacturing sector performance.

The relationship between financial deepening and the performance of the manufacturing sector is explained in figure 2.1 with the transmission mechanism from financial reforms.

Among other things, financial reforms are usually formulated to produce favourable lending rate, exchange rate stability and a reduced inflation rate, with expectation of an enhanced inflow of foreign direct investment, to ensure a deepened financial system. The transmission through the fundamentals is expected to increase manufacturing sector performance. The interaction between the variables is presented in figure 2.1; where

CTSA – Average Capacity Utilization

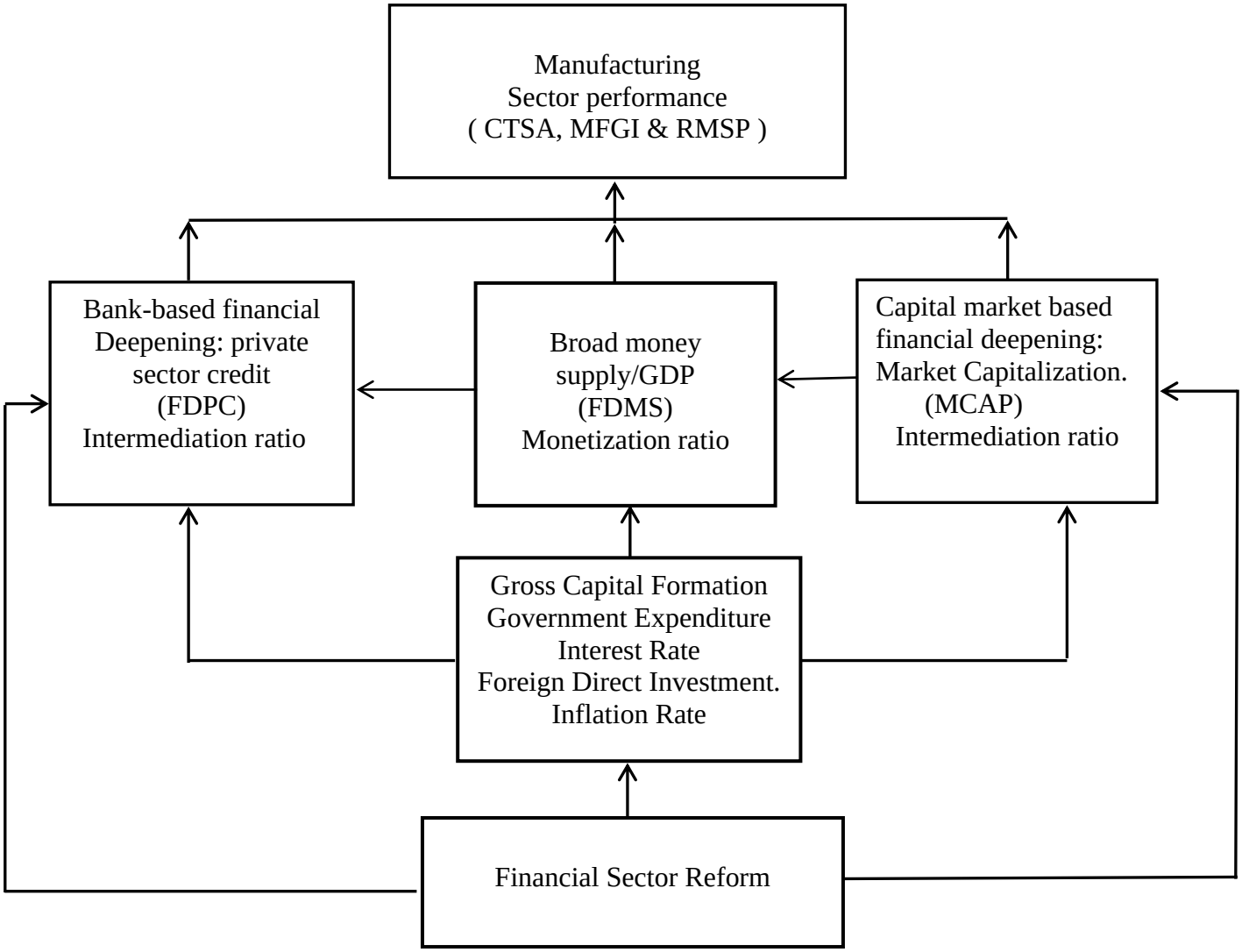
MFGI – Index of Manufacturing Production

RMSP – Manufacturing Sector Contribution to Gross Domestic Product (GDP)

FDPC – Ratio of Private Sector Credit to GDP

FDMS – Ratio of Broad Money Supply to GDP

MCAP – Ratio of Market Capitalization to GDP



Source: *Author's Computation; Adopted from Ojo (2010)*

Fig. 2.**1 Transmission from financial reforms to financial deepening, and to manufacturing sector performance**.

2.2 Theoretical framework

2.2.1 Solow–Swan model

The Solow–Swan model is an exogenous growth model of long-run economic growth set within the framework of neoclassical economics. It attempts to explain long-run economic growth by looking at capital accumulation, labour or population growth, and increases in productivity, commonly referred to as technological progress. It is a neoclassical aggregate production function,

usually of a Cobb–Douglas type, which enables the model to make contact with microeconomics*(*Acemoglu, 2009).The model was developed independently by Robert Solow and Trevor Swan in 1956 and superseded the Post-KeynesianHarrod-Domar model. Due to its particularly attractive mathematical characteristics, Solow–Swan proved to be a convenient starting point for various extensions. The neo-classical model was an extension to the 1946 Harrod-Domar model that included a new term: productivity growth. Important contributions to the model came from the work done by Solow and by Swan in 1956, who independently developed relatively simple growth models. Today, economists use Solow's sources-of-growth accounting to estimate the separate effects on economic growth of technological change, capital, andlabour. Solow extended the Harrod-Domar model by adding labour as a factor of production and capital-labour ratios are not fixed as they are in the Harrod-Domar model. These refinements allow increasing capital intensity to be distinguished from technological progress (Solow, 1956).

In the short run, growth is determined by moving to the new steady state which is created only from the change in the investment, labour force growth and depreciation rate. The change in the capital investment is from the change in the savings rate. The standard Solow(1956) model predicts that in the long run, growth is achievable only through technological progress.

According to Swan (1956), the key assumption of the neoclassical growth model is that capital is subject to diminishing returns in a closed economy.

i. Given a fixed stock of labour, the impact on output of the last unit of capital accumulated will always be less than the one before.

ii. Assuming for simplicity no technological progress or labour force growth, diminishing returns implies that at some point the amount of new capital produced is only just enough to make up for the amount of existing capital lost due to depreciation.At this point, because

of the assumptions of no technological progress or labor force growth, we can see the economy ceases to grow.

iii. Assuming non-zero rates of labour growth complicates matters somewhat, but the basic logic still appliesin the short-run the rate of growth slows as diminishing returns take effect and the economy converges to a constant steady-state rate of growth.

iv. Including non-zero technological progress is very similar to the assumption of non-zero workforce growth, in terms of effective labour: a new steady state is reached with constant output per worker-hour required for a unit of output. However, in this case, per-capita output grows at the rate of technological progress in the steady-state, that is, the rate of productivity growth.

In the Solow-Swan model the unexplained change in the growth of output after accounting for the effect of capital accumulation is called the Solow residual. This residual measures the exogenous increase in total factor productivity (TFP) during a particular time period. The increase in total factor productivity is often attributed entirely to technological progress, but it also includes any permanent improvement in the efficiency with which factors of production are combined over time. Implicitly total factor productivity growth includes any permanent productivity improvements that result from improved management practices in the private or public sectors of the economy (Solow, 1956). Paradoxically, even though TFP growth is exogenous in the model, it cannot be observed, so it can only be estimated in conjunction with the simultaneous estimate of the effect of capital accumulation on growth during a particular time period.

The implication of this theory for the purpose of this study is that an increase in technological investment would promote manufacturing sector growth. A well-deepened financial system would accelerate the rate of investment in technology to drive manufacturing sector productivity.

2.2.2 Finance-led growth Theory: The government-led financial industry cluster

The most established connection between finance and growth could be traced to the work of Schumpeter (1912) where he contended that investors require credit in order to enhance investment. As such, banks and capital markets are to serve as agents to facilitate the financial intermediation of mobilizing saving for investment.

The finance-led growth theory developed by Levine and Zervos (1998), postulates the "supply-leading" relationship between financial and economic developments. It is argued that the existence of financial sector, as well-functioning financial intermediations in channeling the limited resources from surplus units to deficit units, would provide efficient allocation of resources, thereby leading the other economic sectors in their growth process.

The government-led model is adapted to the Supply-Leading theory, which holds that in the formation process of the financial industry cluster, the state or local government would launch a space layout according to the economic development strategy, and in accordance with the relevant standards to evaluate the economic and financial situation of the city, and then select a city with sound financial foundation and development potential for the financial industry cluster (Solarin & Jauhari, 2011).

The theory holds that with the development of the financial industry, savings will increase and will be transformed into investment through the various financial institutions, which improves the efficient allocation of funds and greatly promotes manufacturing sector performance and economic growth through the multiplier effect. While giving quite loose and flexible industrial policy to support and guide the location of financial institutions and the direction of financial capital investment, to drive the rapid development of the financial markets and form the financial industry cluster (Patrick, 1966). The process of the government-led financial industry cluster is a

successful case formed by the government-led model. The industry cluster is mostly generated in the emerging industrial countries after the World War II. The main reason is that the trend of the global economy integration becomes more evident after the World War II, and the industrial gradient shifted in the global scope, and the financial capital flowed around the world.

Compared to the developed capitalist countries such as the UK, USA, etc, the emerging industrial countries are still in the rising phase, and their financial system are not yet complete and lack the competitive strength. If they had kept applying the Demand-Following theory to gradually develop the financial industry, it would be hard to achieve the expected development within a short time. Therefore, these countries or regions need to rely on the state or local government's artificially design policy support, which can accelerate the development of the modernization and internationalization of the financial industry.

In the formation and development process of the government-led financial industry cluster, the role of government is active and positive. Through a series of policies to drive the development of the national economy and the financial sector, development strategies are carried out. Indeed, a number of studies have argued that the development of financial sector has significantly promoted economic development (Schumpeter, 1912; Levine, 1997). The theory implies that a well deepened financial system would produce enhanced manufacturing firms performance. The end result would be a consistent economic growth and development.

This study is anchored on theFinance Lead-Growth theory. There are documented evidence (Khan & Senhadji, 2000; Adjasi & Biekpe, 2005) to suggest that Levine and Zervos (1998) finance-growth linkage model has been adjudged as one of the most efficient basic models to investigate macroeconomic issues, especially macroeconomic issues with financial system component. The model is depicted as follows:

$$LogY_{it} = \alpha_1 + \alpha_2 CMT_{it} + \alpha_3 X_{it} + e_{it} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (2.1)$$

Where:

Yit is economic growth measured as the log of: ($GDPCt/GDPCt-1$) in country *i* and at time *t*. As observed, the proxy for economic growth is averaged for a test of robustness in the growth model.

$CMT_{it}$is the capital market indicators for country *i* at time *t*;

X_{it}contains control variables and *eit* is the error term.

The major explanatory variables in this model are capital market based and given that the study focuses on investigating the effect of financial deepening (*FDNG*); which is decomposed into; money based, capital market and banking sectors indicators, on manufacturing firm performance (*MFPD*), there is the need to reconstruct the Levine and Zervos (1998) model. In doing this, the study used King and Levine (1993) model.

King and Levine (1993) studied 77 countries over the period from 1960-1989 to examine capital accumulation and productivity growth channels. They analyzed whether the level of financial development predicts long-run economic growth, capital accumulation, and productivity growth. In their study, they assess the strength of the empirical relationship between each of three indicators of the level of financial development average over the 1960-1989 period, and three growth indicators also average over the 1960-1989 period

Their model is depicted as follows:

$$G(j) = \alpha + \beta F(i) + yX + \mathcal{E} \qquad (2.2)$$

From equation 2.2, the growth indicators are; 1. the average rate of real per capita GDP growth, 2.The average rate of growth in the capital stock per person, and 3. Total productivity growth, which is a “solow residual” defined as real per capita GDP growth minus (0.3) times the growth rate of the capital stock per person. In other words, if F(i) represents the value of the ith indicator of financial development average over the period 1960-1989, G(j) represents the value of the jth growth indicator (per capita GDP growth, per capita stock growth, or productivity growth)

average over the period 1960-1989 and X represents a matrix of conditioning information to control for other factors associated with economic growth (ie. income per capita, education , political stability, indicators of exchange rate, trade, fiscal, and monetary policy), then they estimated the following regression on a cross section of 77 conditions.

The major draw-back of this model is the use of only bank based indicators as the core variables for financial development. However, using the money based indicator as a core explanatory variable against its use as a control variable in King and Levine (1993) and the merging of the resulting equation with Levine and Zervos (1998) models, serves the purpose of this study.

The reconstructed basic model adopts Total Productivity which is one of the three explained variables in King and Levine (1993) model, and importing the capital market variable (CMT) from Levine and Zervos (1998) model into King and Levine (1993) model, the new model is as depicted in equation 2.3.

$$G(j) = \alpha_0 + \alpha_1 CMT_{it} + \alpha_2 F(i) + yX + \mu \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (2.3)$$

This modelis restructured based on the theory of financial liberalization, pioneered by McKinnon (1973) and Shaw (1973), which advocatesthat free markets should be the basis for determining credit allocation and that the markets should be liberalized completely. As a result, there will be an increase in the efficiency of savings and investments and the overall real credit supply to the manufacturing sector and to the economy in general, will increase.

Therefore, an increase in credit to the manufacturing sub-sector by financial institutions provides investible funds needed for investment. This in turn will leads to an increase in the performance of the sector.

Based on this theoretical postulation, this study hereby specify manufacturing sector performance indicators as linear function of financial deepening variables and some controlled

variables adopted from King and Levine (1993) model and others that are expected to affect manufacturing sector performance. Therefore, we substitute manufacturing firm's performance indicators for total productivity while retaining the money, capital market and banking sector components in deepened forms, the new model is as presented in equation 2.4.

$$MFPF_{it} = \alpha_1 + \alpha_2 CMT_{dit} + \alpha_3 F(i) + MBI_{it} + \alpha_4 X_{dit} + e_{it} \ldots\ldots\ldots\ldots\ldots (2.4)$$

From equation 2.4, $MFPF_{it}$represent manufacturing Sector Performance, indicators of; average capacity utilization, contribution of manufacturing sector to Gross Domestic Product (GDP) and average capacity utilization of manufacturing sector. $CMT_{it}$is the capital market deepening indicator, proxy by the ratio of market capitalization of manufacturing firms to GDP. F(i) is the banking sector deepening indicator proxy by the ratio of credit to the private sector to GDP and MBI_{it}, is the money based deepening indicator represented by broad money supply as a ratio of GDP. Also, X_{it}contains the control variables while $e_{it}$is the error term. Control variables are used to accommodate other variables that are likely to affect the outcome of the estimation aside the identified core variables.

2.3 Empirical review

Several studies with mixed results have been conducted across countries to establish the relationship between financial deepening, manufacturing sector performance and growth. Some of the studies used developing and developed countries data sets. Some others adopted sub-regional African approach. Findings produced mixed conclusions depending on data and the financial deepening indicators adopted.

2.3.1 **Evidence from developed countries**

In a study on the cycles of financial expansion and contraction and their impact on real economy using Data Envelopment Analytical, Aizenman, Pinto and Sushko (2013), selected eight real economic sectors in twenty-eight countries from 1960 to 2005. The findings show that after periods of accelerated growth, there exist the tendency for financial contractions to follow thereafter. Further, the study shows that even though many of the real sector are negatively affected by financial contractions, they are not enhanced by financial expansions.

As reported by Nzotta and Okereke (2009), Goldsmith (1969), advanced the financial interrelation ratio (FIR) to measure the extent of financial deepening and financial development. Financial interrelation ratio is the ratio of intangible assets to national wealth. Goldsmith calculated financial interrelation ratio (FIR) as the ratio of all financial instruments at a given time, to the value of the national wealth and found that the ratios for developed countries were far higher than those of developing countries. Goldsmith concluded that because the development of financial institutions affects economic development, the low level of development of the financial superstructure has negative effect on economic development.

On the performance of manufacturing firms, Thore, Kozmetsky and Phillips (1994) examined the productive efficiency of U.S. computer manufacturing firms using Data Envelopment Analysis (DEA). They established that few corporations were able to stay at the productivity efficiency throughout the time period under study.

Robert and Ross (1993) examined how financial systems affect economic growth by constructing an endogenous growth model in which financial systems evaluate prospective entrepreneurs, mobilize savings to finance the most promising productivity-enhancing activities, diversify the risks associated with these innovative activities, and reveal the expected profits from engaging in innovation rather than the production of existing goods using existing methods. They

used cross-country regressions to evaluate the strength of the partial correlation between each growth indicator and each financial indicator using the average value of the growth and financial indicators over the same time period, 1960 to 1989. They found that financial sector distortions reduce the rate of economic growth by reducing the rate of innovation.

2.3.2 **Evidence from developing countries**

Mert and Serap (2017) investigated the causality between financial development and firm growth in Turkish manufacturing industry during the period 1989-2010. Adopting a non-causality method proposed by Dumitrescu and Hurlin, the study which considered heterogeneity and cross-sectional dependence revealed that the supply-leading hypothesis holds for majority of the subsectors. The study noted that the result was robust across the subsectors irrespective of the financial development proxy. In addition, the study showed that firm growth is not uniform across subsectors.

Mahmoud and Ali (2015) examined the role of institutions, financial deepening and degree of regime authority on growth rates in the Middle East and North Africa (MENA) region using panel data through a fixed effect model. They found that English civil law origin and the establishment of the rule of law work with the development of financial institutions to increase economic growth in these economies Institutions and Development in MENA Region. It was also found that the democratization of the political institutions and foreign direct investment do not assist financial development in promoting economic growth. The findings emphasized the prominence of overcoming institutional weaknesses and establishing transparent public policy governing businesses as a pre-requisite for successful universal integration in developing countries.

Ngongang (2015) examined the relationship between Financial Development and economic growth in Sub-Sahara Africa. He obtained data from 21 Sub-Saharan African (SSA) countries using the dynamic panel GMM technique. He found that there exists a positive link between financial development and economic growth.

Luqman (2014), investigated financial deepening and economic growth nexus in Pakistan. The analysis, using Vector error correction model methodology indicated a long run relationship between inflation rate, foreign direct investment, financial deepening; proxy by total credit to private sector and economic growth. Further, the study reveals that the level of financial deepening in Pakistan has remained relatively low.

Niresh and Velnampy (2014) examined the effects of firm size on profitability of quoted manufacturing firms in Sri Lanka. They made use of data of 15 companies which were active in Colombo Stock Exchange (CSE) between the years 2008 and 2012. They analysed the obtained data with the aid of correlation and regression. The variables employed are Return on Assets and Net Profit as indicators of firm profitability while Total Assets was utilized as indicators of firm size. Findings from the study revealed that firm size has no significant impact on profitability of the listed manufacturing firms in Sri Lanka.

Adu, Marbuah and Mensah (2013) examined financial deepening and economic growth nexus in Ghana. The financial deepening indicators used are the ratio of money supply to GDP, ratio of Private sector credit to GDP and ratio of domestic credit to GDP. The ordinary least square method adopted suggests a positive impact of all the financial deepening indicators on economic growth in Ghana except the ratio of broad money supply to GDP.

Nguena and Abimbola (2013) investigated the implication of financial deepening dynamics for financial policy coordination from 1980 to 2011 in six West Africa Economic Monetary Union, comprising Burkina Faso, Ivory Coast, Guiney Bissau, Mali, Senegal and Togo. The study

employed both the static and dynamic panel data regression for the empirical analysis. Three indicators of: domestic credit to the private sector, bank credit and financial depth were used as proxy for financial deepening, using the technique of principal component analysis. The finding reveals that there is a convergent dynamic, which implies that a high or low initial level of financial deepening is favorable to the improvement of the financial deepening index over the time in the WAEMU zone.

Mehran and Izah (2012) examined the performance analysis of manufacturing firms in Pakistan. They assess fourteen manufacturing firms in Pakistan using financial accounting ratios with data collected from OSIRIS database. They made use of these variables; total assets, expenses, sales, profit before tax and return on assets, which were compared and analyzed from 2006 to 2010. The Correlation analysis showed that total assets (return on asset), sales and profit before tax are positively related indicating economies of scale, that is, large firms are able to take advantage of their size.

Haron and Chellakumar (2012) evaluated the efficiency performance of manufacturing companies in Kenya from 2009 to 2011. The study included three critical input variables (raw materials, staff expenses and plant and machinery) and two output variables (net sales and earnings after tax) to evaluate the relative efficiency of selected thirty manufacturing companies in Kenya. The study categorized the selected companies into large-sized, medium-sized and small sized and gathered data from Kenya Association of Manufacturers database. To achieve the objective of the study, the researchers employed Pearson Correlation, to indicate positive correlation between input and output variables, and input approach of DEA model. The results show that small-sized company has the highest relative efficiency compared to medium-sized and large-sized companies. In addition, the study found that one large-sized company, two medium-

sized companies and three small-sized companies operate under the most productive scale size throughout the three-year period of study.

Gupta (2011) investigated the differential impact of increased financial development on industrial output, across state and industry categories using an unbalanced panel of 15 Indian states, 22 industries at the 2-digit level for an 11-year period spanning 1992-2002. The study's most novel contribution comes from hypothesising and testing for operating channels though which increased financial depth benefits output. It was found that financial depth facilitates increased use of contract labour by industries, which in turn lessened the effects of industrial disputes and increases output. However, financial depth has failed to directly benefit industries with the greatest need for external financing.

Yusof, Razali, and Tahir (2010) evaluated operational efficiency of fourteen Malaysian public listed companies for the period 2004-2008 using Data Envelopment Analysis (DEA) approach and by drawing the Performance Matrix which is based on the DEA Efficiency and Profitability index (return on assets). Inputs were taken as total expenses (financial and operating expenses) and total assets, and output taken as sales. The study found that the overall efficiency was around 50% and only one company was consistently efficient in 5 years. Using the Performance Matrix, it was found that only three companies appeared as having highest average return on asset (ROA) among fourteen companies and out of this only one company appeared in Quadrant 1 as Super star. They found that 3 out of 14 companies have low efficiency and low profitability over 5 years.

Al-Zubi, Al-Rjoub, and Abu-Mhareb (2006) investigated the relationship between financial development and economic growth. They applied a model developed by Levine in 1997 using panel data for eleven Arab countries during the period 1980-2001. They improved on the model by adding new four financial indicators in the second stage of the empirical test to measure the effect

of public credit ratios on economic growth. They applied a Hausman's specification test to examine the fixed and random effects in the panel data. The results on the application of Levine (1997) model revealed that all financial indicators are insignificant and did not affect economic growth. The result of the modified model showed that only pubic credit to domestic credit (PUBCR) indicator had a significant and positive effect on economic growth, indicating the dominance of the public sector in economic activities and the financial sectors are still underdeveloped and need more efforts to be able to exert its functions effectively in the Arab countries.

Ndebbio (2004) investigated financial deepening, economic growth and development using some selected Sub-Saharan African countries. The study identified the range of financial assets that can adequately approximate financial deepening, which simply means an increase in the supply of financial assets in the economy. He represented financial deepening (FD) by two variables, the degree of financial intermediation/development (M2/Y) and the growth rate in per capita real money balances (GPRMB). Estimations depending on the two measures of FD and other explanatory variables of interest were done with an ordinary least square (OLS) multiple regression procedure. The study found that financial deepening as represented by the growth rate of per capita (real/nominal) money balances (GPRMB/ GPMB) and degree of financial intermediation (FDY) positively affect per capita growth of output.

Odiambho (2004), investigated the impact of financial development on economic growth in South Africa, using Johansen and Juselius Cointegration approach and Vector error correction model. He adopted three proxies of financial development; which are: the ratio of broad money supply (M_2) to gross domestic product (GDP) the ratio of bank claims on the private sector to GDP and the ratio of currency to narrow money against economic growth proxy by real GDP per

capital. The findings rejected the supply, leading hypothesis in favour of demand following hypothesis.

In Morocco, Fatima (2004) investigated the causality between financial deepening and economic growth from 1990 to 2000 period. She used the ratio of liquid liabilities (M_3) to gross domestic product (GDP), and the ratio of domestic credit by the banking sector to GDP, as financial depth indicators. The granger causality test used produced a short-run direct relationship between financial deepening and economic growth.

2.3.3 **Evidence from Nigeria:**

Okoye, Nwakoby andOkorie(2016) examined the effect of economic liberalization policy on the performance of the industrial sector in Nigeria. The study specifically examined the extent to which changes in some key economic indicators like exchange rate, financial deepening, trade openness and lending rate account for the trend in output performance of Nigeria's industrial sector in the post reform period. The study made use of data over the period 1986-2014 and carried out the analysis using econometric technique based on the Vector Error Correction Model. The study found that rate of change in exchange rate, trade openness and lending rate exert significant negative impact on industrial output. Also, a significant positive impact of financial deepening on industrial output was found. The Granger causality estimate shows weak causal impact of financial deepening on industrial output as well as bi-directional causation between trade openness and industrial output. There is also evidence of causal impact of industrial output on lending rate, an indication that industrial development generates demand for financial resources.

Frances, Chukwuedo and Chukwunonso (2016) examined the relationship between financial deepening and investment in Nigeria using data spanning from 1970 to 2013, adopting the Gregor-Hansen Endogenous structural break methodology and the supply-leading hypothesis

in building their model. From the Granger Causality test, a unidirectional causality, running from financial deepening to investment was found. It was also found that the financial deepening has a statistically significant impact on domestic investment.

Nwanna and Chinwudu (2016) investigated financial deepening and economic growth nexus in Nigeria from 1985 to 2014. The study focus on the impact of stock market and bank based financial deepening variables; such as money supply, market capitalization, private sector credit and financial savings, on economic growth in Nigeria. The study adopted the supply leading hypothesis, using the Ordinary Least Square (OLS) analytical technique. The findings show that both bank based and stock market based financial deepening proxies have significant and positive effect on economic growth in Nigeria. The implication of their findings is that banks and stock markets have important roles in the process of economic growth in Nigeria.

Campbell and Asaleye (2016) investigated the effect of financial reforms on output growth of the manufacturing sector in Nigeria. The study focused on the effectiveness of financial reforms in promoting output growth in the manufacturing sector during the pre and post reform epoch in Nigeria. They employed descriptive statistics and vector error correction mechanism and the results show that financial sector performed better in the post reform age compared to the pre-reform era. Surprisingly, the growth of manufacturing output was not impressive in the post-reform era and also the correlation coefficient of financial indicators was low during this period. According to the study, it thus imply that the development of manufacturing sector under financial reforms in Nigeria have not been impressive. The study concluded that the increased gross domestic product experienced in Nigeria during this period does not contribute meaningfully to the manufacturing sector to the point of inducing development of the sector. Thus, the study emphasized on the need to properly review the financial sector reforms introduced during this

period so that it can enhance output growth of the manufacturing sector since the manufacturing sector is considered crucial to the growth of the economy at large.

Olanrewaju, Aremo and Aiyegbusi (2015) investigated the impact of banking sector reforms on the output of manufacturing sector in the Nigerian economy between 1970 and 2011. Their findings shows that the effects of Bank assets, Lending rate, Exchange rate and real rate of interest on manufacturing output were positively significant but with very low impact. It was also found that the financial deepening and interest rate spread negatively and significantly impacted on the output growth of manufacturing sector in Nigeria. They concluded that the effects of banking sector reforms on the output growth of manufacturing sector were significantly low in the Nigerian economy. However, the findings indicated that the impact of the various banking reforms could vary widely on the economy depending on the time lags involved.

Adeusi and Aluko (2015) investigated the relevance of financial sector development on real sector productivity in Nigeria in the 21st century. The study adapted the financial sector development measures used in King and Levine (1993) as predictors of industrial sector production output. Employing the Ordinary Least Square (OLS) technique, the study revealed that there is a strong linear relationship between financial sector and real sector productivity. The result of the study indicated that financial sector development is a veritable means to enhance real sector productivity. In a related study,Adeola (2005) explored the effect of financial development on real sector growth in Nigeria. With the adoption of Ordinary Least Square (OLS) approach the study revealed that financial sector development has remarkable impact on real sector growth in Nigeria. However, the result of the study further show that credit allocated to the private sector exhibited a significant impact while liquid liabilities and the size of financial intermediaries exert significant positive influence of real sector growth.

The effect of financial sector reforms on the growth of manufacturing sector in Nigeria studied by Dada (2015), selected a sample of manufacturing output and financial sector variables; credit to manufacturing sector, real rate of interest to manufacturing sector, market capitalization to manufacturing sector and total deposit to manufacturing sector to examine the financial sector reform and evaluates its effects on manufacturing sector. The study, which covered periods from 2001 to 2011, made use of co-integration and Granger causality techniques to establish the relationship between the two phenomena. The study found that financial reforms have direct effects on the growth of the manufacturing sector in Nigeria. Policy implication directed thought towards the need for government to create a conducive and an enabling environment through improved infrastructures and security as well as formulating and implementing policies that will protect local industries so as to enable growth and development of the manufacturing sector in Nigeria.

Ogunsakin (2014) investigated the impact of financial sector reforms on the performance of manufacturing sector in Nigeria employing the multivariate co-integration technique as developed by Johansen and Juselius (1990). Having established the co-integration of the included variables, the findings of the study further show that financial sector reforms in Nigeria did not have significant impact on manufacturing performance in Nigeria during the period of study. The study posited that government should put in place appropriate policies that will stimulate increase availability and efficient allocation of credit to the private sector.

Atoyebi, Okafor and Falana (2014) examined the global financial meltdown and its effect on manufacturing sector in Nigeria. The study focused on the influence of global financial recession on Nigerian manufacturing sector vis-a-viz the Nigeria economy. The study discovered that financial crisis will cause commodity prices to fall, decline in export, and lower portfolio.

Agbaeze and Onwuka (2014) carried out a study on the Nigeria experience of financial liberalization and investments. Empirical data from Nigeria shows that investment especially private sector investments have not improved following financial liberalization in the country in the late 1980s and the sequencing of the liberalization process and hostile macroeconomic environment have combined to minimize the expected benefits of financial liberalization.

Ewetan and Ike (2014) examined the long run and causal relationship between financial sector development and industrialization in Nigeria for the period 1981 to 2011 using time series data. Their findings provided evidence of long run relationship between financial sector development and industrialization in Nigeria. Also, it was found that the two measures of financial deepening had contrasting effects on industrial output; while Ratio of private sector bank credit to GDP has a positive relationship with industrial output, the ratio of broad money stock to GDP has a negative relationship with industrial output. A long-run unidirectional causal link running from industrialization to financial development was also found, thereby supporting the demand following hypothesis.

Ogar, Nkamare and Effiong (2014) examined how commercial bank credit can influence manufacturing sector in Nigeria. They used time series data analysed with Ordinary least square of multiple regression model to establish the relationship between dependent variable and independent variables. The study shows that commercial bank credit, if well channelled to the worthy customers or sector will enhance economic growth in Nigeria. That is, commercial bank credit had a significant relationship on manufacturing sector.

Imoughele and Ismaila (2014) investigated the impact of monetary policy on Nigeria's manufacturing sector performance for the period 1986 to 2012. Unit root test, Granger Causality test, co integration and VAR model were some of the econometrics techniques used for data estimation. The individual variables: external reserve, exchange rate and inflation rate are

statistically significant to manufacturing sector output while broad money supply and interest rate are not statistically significant to manufacturing sector output in the previous and current year. However, interest rate, exchange rate and external reserve impacted negatively on the sector output but broad money supply and inflation rate affect the sector positively. The pair-wise Granger Causality results suggest that real exchange rate and external reserves granger cause Nigeria's manufacturing output within the period of the study.

Ugbaje and Ugbaje (2014) examined the linkage between financial sector and economic growth in Nigeria which has been controversially debated in finance and economic literatures. The study discovered strong positive relationship between financial sector and economic growth and causality runs from market capitalization, banking sector credits and foreign direct investment to the real gross domestic product which supports the supply-leading hypothesis. They concluded that market capitalization, banking credits and foreign direct investment impact significantly on real gross domestic product.

Ayila, Akighir and Iorember (2014) investigated the cause-effect relationship between financial deepening and economic growth in Nigeria for 32 years in a five-variable multivariate model using Autoregressive Distributed Lag (ARDL) model approach. The study found a unique cointegrating relationship among economic growth, financial deepening, index of openness, interest rate and market capitalization. The bound testing, cumulative sum of recursive residuals and cumulative sum square of recursive residuals results suggested that, financial deepening has a positive and significant effect on economic growth in the long-run.

Garba (2014) examined the relationship between Financial Sector Development and Economic Growth in Nigeria using time series data for 20 years. The result shows that development in financial sector variables; banking sector credits, total market capitalization and

foreign direct investment positively affect economic growth variables; Real Gross Domestic Product.

Edeme and Karimo (2014) examined the impact of economic liberalization on industrial sector performance in Nigeria. The study attempted to find out how such government policy action determine the macroeconomic performance and it was discovered that economic liberalization has a significant impact on performance of the Nigerian manufacturing, mining and quarrying, and power subsectors and the aggregate industrial sector. From the result, the interaction of the policy with trade openness and financial deepening dampened the performance of the manufacturing subsector while its interaction with labour force is growth-enhancing. Also, the interaction of the policy with energy consumption was found to be negative but financial deepening and energy consumption has dampening effect on the performance of the mining and quarrying subsector. While it has enhancing impact on the aggregate industrial sector and is not significant on mining and quarrying and power subsectors, economic liberalization decreased the performance of the manufacturing subsector. It was also established that financial deepening has mix impact on the performance of the industrial sector, while it has increasing impact on the aggregate industrial sector,its impact on manufacturing performance is negative.

Adekunle, Salami, and Adedipe (2013) carried out an investigation into the impact of Financial Sector Development on the Nigerian Economic Growth. They sought to find out the impact of the sector in the Nigerian economy and to discover whether the sector has been able to achieve its main objective of intermediation as a result of the inability of the sector to assist the real sector despite the huge profits declared yearly and also the short-term lending of the banks instead of long term investment that can boost the economy. The study found that only the real interest rate is negatively related. All the explanatory variables used are statistically insignificant.

They also found that the link between the financial and real sector still remains weak and could not propel the needed growth towards the vision 2020.

Odior (2013),investigated the impact of macroeconomic factors on manufacturing productivity in Nigeria over the period of 37 years from 1975 to 2011. His result revealed the presence of a long-term equilibrium relationship, as evidenced by the cointegrating equation of the VECM and concludes that credit to the manufacturing sector in the form of loans and advances and foreign direct investment have the capacity to sharply increase the level of manufacturing productivity in Nigeria, while broad money supply has less impact.

Torruam, Chiawa, and Abur (2013) investigated the impact of financial deepening on economic growth in Nigeria. They examined the causal relationship between financial deepening and Economic Growth in Nigeria for the period of 22years. They found the existence of a unidirectional causality between economic growth and financial deepening in Nigeria and concluded that financial deepening has an impact on economic growth in Nigeria. Their result implies that developing the financial sector in Nigeria improves financial structures and ensures efficient delivery of financial services to the private sector to invest and attract more private sector participation for increase output.

Emeka and Aham (2013) also examined Financial Sector Development and Economic Growth Nexus in Nigeria. The study employed the cointegration/Error Correction Mechanism (ECM) with annual dataset covering the period of 30 years. The empirical results showed that there is a positive effect of financial sector development on economic growth in Nigeria. Also, credits to private sector and financial sector depth are ineffective and fail to accelerate growth. This result signifies the effect of government borrowings, the problem of huge non-performing loans, and a deficient legal system on the private sector.

Agbada and Osuji (2013) carried out an empirical analysis of trends in financial intermediation and output in Nigeria from the banking crises for the period of 30 years using the endogenous components of financial intermediation such as Demand Deposits (DD), Time/Savings deposits (T/Sav) and Credits (Loans and Overdraft) to predict the outcome of Gross Domestic Product. They found that though there exist a positive growth relationship between financial intermediation and output in Nigeria, there also exist elements of negative short-run growth relationship for the periods that suffered financial shocks resulting from the global financial crisis.

Babalola (2013) investigated the effect of firm size on firms Profitability in Nigeria. He researched into the factors determining these observed variables (firm's size, profitability, and survival) and how they operate in industrial organization and more generally in developing country like Nigeria. He considered firm size as an important determinant of firm profitability measured with return on assets while both total assets and total sales were used as the proxies of firm size. He analysed the effect of firm size on the profitability of manufacturing companies listed in the Nigerian Stock Exchange by using a panel data set over the period 2000-2009. The finding shows that firm size has a positive impact on the profitability of manufacturing firms in Nigeria.

Maxwell and Oluwatosin (2012) studied the influence of financial deepening on manufacturing output in Nigeria for period spanning from 1970 to 2010. The study made use of vector autoregression technique to analyze banking annual data obtained from Central Bank of Nigeria (CBN) statistical bulletin and annual reports. The results revealed that coefficients of financial deepening indicators included in the study do not exert significant effect on manufacturing output in Nigeria. The study also pointed out that the impact of non-oil trade balance on the manufacturing output is not significant. According to the study, this could be due to the weak capacity of Nigerian manufacturing firms to compete effectively in the export market

for manufactures. Thus, it was recommended that policy action should focus on innovating productive enhancing reform that will be better directed towards meeting the needs of the manufacturing sector in Nigeria.

Elijah and Uchechi (2012) adopted autoregressive distributed lag (ARDL) cointegration method to analyze the link between financial development and industrial production growth in Nigeria from 1970 to 2009 using time series data obtained mainly from CBN statistical bulletin. The study found a cointegrating relationship between financial sector development and industrial production in Nigeria. In addition, the study revealed that both long run and short run dynamic coefficients of financial sector development exhibited significant negative impact on industrial production. Based on these outcomes, the study noted that one of the policy implications is that the most important task for Nigerian government is to ensure that further healthy financial sector reforms that will enhance the efficiency of the domestic financial sector are introduced. The study further posited that the inefficiency of the financial sector is responsible for its adverse effect on industrial production in Nigeria.

Sulaiman and Azzez (2012) investigated the effect of financial liberalization on economic growth in developing countries using Nigeria as a case study. In their empirical analysis with a time series data from 1987 to 2009, GDP was the dependent variable and the financial liberalization indicators are; inflation rate, lending rate, exchange rate, financial deepening (M_2/GDP) and degree of openness. The cointegration and error correction model approach adopted reveal that financial liberalization has a growth stimulating effect in Nigeria.

Onwumere, Ibe, Ozoh and Mounanu (2012) investigated the impact of financial deepening on economic growth in Nigeriausing a data set from 1992 to 2008. They adopted the supply-leading hypothesis using variables such as broad money velocity, money stock diversification, economic volatility, market capitalization and market liquidity as proxies for financial deepening

and gross domestic product growth rate for economic growth. They found that broad money velocity and market liquidity promote economic growth in Nigeria, while money stock diversification, economic volatility and market capitalization did not within the period studied.

Obamuyi, Edun and Kayode (2012) investigated the effect of bank lending and economic growth on manufacturing output in Nigeria using a times series data covering a period of 36 years (1973-2009). Their findings showed that manufacturing capacity utilization and bank lending rates significantly affect manufacturing output in Nigeria. Though, they could not establish the relationship between manufacturing output and economic growth.

Udoh and Ogbuagu (2012) examined the financial sector development and industrial Production in Nigeria. Findings show that both the long run and short run dynamic coefficients of financial sector development variables have negative and statistically significant impact on industrial production. The study concluded that the most important task for government of Nigeria is to introduce further financial sector reforms to improve the efficiency of the domestic financial sector which is a pre-requisite for the achievement of industrial development. Also, that the inefficiency of the financial sector is responsible for the adverse impact on industrial production.

Rasheed (2010) investigated financial development and productivity in the Nigerian manufacturing subsector using Cointegration and error correction model. The study indicates the presence of a long-run equilibrium relationship among index for manufacturing production, determinants of productivity, economic growth, interest rate spread, bank credit to the manufacturing subsector, inflation rates, foreign direct investment, exchange rate and quantity of graduate employment.

Nzotta and Okereke (2009) empirically examined the relationship between financial deepening and economic development in Nigeria between 1986 and 2007. They considered a high level of financial deepening a necessary condition for accelerating growth in an economy because

of the central role of the financial system in mobilizing savings and allocating same for the development process. They sought to establish the relationship between these variables and financial deepening index. They found that financial deepening index is low in Nigeria over the years and that the nine explanatory variables, as a whole are useful and have statistical relationship with financial deepening. They also found that four of the variables used in the study; lending rates, financial savings ratio, cheque/GDP ratio and the deposit money banks/GDP have significant relationship with financial deepening.

Using the Autoregressive Distributed Lag (ARDL) procedure, Agu and Chukwu (2008) investigated the contribution of financial development to economic development from 1960 to 2007 period. The findings suggest a long run relationship where the accumulation of public capital appears to curtail output expansion.

2.4 Summary of empirical literature

The summary of the reviewed literaturesas grouped into those that were carried out in developed countries, developing countries and Nigeria specifically, is presented in Tables 2.1, 2.2 and 2.3.

TABLE 2.1: DEVELOPED COUNTRIES EMPIRICAL STUDIES

S/N	TITLE	AUTHOR	METHODOLOGY	RESULT
1.	Financial sector ups and downs and the real sector in the open economy.	Aizenman, Pinto & Sushko (2013)	Data Envelopment Analysis.	Many of the real sectors are negatively affected by financial contractions and are not improved by financial expansions.
2.	Strategic alignment and performance of market-seeking Manufacturing Companies (MNCs) in China.	Luo & Park (2001)	Panel data	There is a significant difference in financial performance among market-seeking MNCs depending on strategic orientations, with the analyzer orientation producing the highest performance.

3.	The performance of manufacturing firms in U.S.A	Thore, Kozmetsky & Phillips (1994)	Data Envelopment Analysis (DEA) approach	Few corporations were able to stay at the productivity efficiency throughout the time period under study.
4.	The impact of international financial integration on Industry growth	Vanassche, E. (2004).	Regression analysis	An existence of a statistically significant effect of financial openness on the development of the domestic financial system

TABLE 2.2: DEVELOPING COUNTRIES EMPIRICAL STUDIES

5	Causality between financial development and firm growth in Turkey.	Mert & Serap (2017)	Non-Causality method by Dumitrescu and Hurlin	Firm growth is not uniform across subsectors.
6	Financial deepening and degree of regime authority on growth rate in Middle East and North Africa (MENA).	Mahmound & Ali (2015)	Panel data	Rule of law work with financial institutions to increase growth.
7.	Relationship between financial development and economic growth in Sub-Sahara Africa.	Ngongang (2015)	Dynamic Panel Gmm technique.	There exist a positive link between financial development and economic growth.
8.	Financial deepening and Economic growth nexus in Pakistan.	Luqman (2014)	Vector error correction model.	Existence of long-run relationship between financial deepening and Economic growth.
9.	The effect of firm size on profitability of quoted manufacturing firms in Sri Lanka.	Niresh & Velnampy (2014)	Correlation and regression approach.	Firm size has no significant impact on profitability.
10.	Financial deepening and economic growth nexus in Ghana.	Adu, Marbuah & Mensah (2013).	Ordinary Least Square.	A positive impact of financial deepening on economic growth.
11.	Implication of financial deepening dynamics for financial policy coordination in the WAEMU sub-region.	Nguena & Abimbola (2013)		
12.	Performance analysis of manufacturing firms in Pakistan.	Mehran & Izah (2012)	Financial accounting ratios and Correlation analysis	Total assets (return on asset), sales and profit before tax are positively related indicating economies of scale, that is, large firms are able to take advantage of their size.
13.	Efficiency performance of manufacturing companies in Kenya: Evaluation and Policies.	Haron & Chellakumar (2012)	Pearson Correlation and Data Envelopment Analysis (DEA) model.	Small-sized company has the highest relative efficiency compared to medium-sized and large size company.
14.	The differential effects of financial development on India's	Gupta (2011)	Panel data	Financial depth facilitates increased use of contract labour by industries,

	industrial performance			which in turn lessened the effects of industrial disputes and increases output.
15.	Operational efficiency of public listed companies in Malaysia	Yusof, Razali & Tahir (2010)	Data Envelopment Analysis (DEA).	The overall efficiency was about 50%, with only one company consistently efficient.
16.	Relationship between financial development and economic growth.	Al-Zubi, Al-Rjoub & Abu-Mhareb (2006)	Panel Data	Financial indicators did not affect economic growth.
17.	Financial deepening, economic growth and development nexus.	Ndebbio (2004)	Multiple regression.	Financial deepening positively affected output growth.
18.	Impact of financial development on economic growth in South Africa.	Odiabho (2004)	Vector Error Correction Model.	Supply leading hypothesis is rejected and demand following hypothesis is established.
19.	Causality between financial deepening and economic growth.	Fatima (2004)	Granger Causality test procedure.	A short-run direct relationship between financial deepening and economic.

TABLE 2.3: NIGERIANEMPIRICAL STUDIES

20.	Economic openness and industrial development sector in Nigeria.	Okoye, Nwakoby, & Okorie(2016)	Vector Error Correction Model & Granger causality	There is evidence of significant positive impact of financial deepening on industrial output. The Granger causality estimate shows weak causal impact of financial deepening on industrial output, as well as biodirectional causation between trade openness and industrial output.
21.	Financial deepening and domestic investment in Nigeria.	Frances, Chukwuedo & Chukwunonso (2016)	Granger Causality Test	Financial deepening has a statistically significant impact on domestic investment.
22.	Financial and economic growth nexus.	Nwanna, & Chinwudu (2016)	Ordinary Least Square (OLS).	Both bank based and capital market based financial deepening proxies have significant positive effect on economic growth.

23.	Effect of Financial reforms on output growth of the manufacturing sector.	Campbell & Asaleye (2016)	Vector error correction mechanism	The development of manufacturing sector under financial reforms have now been impressive
24.	Banking sector reforms on the output of manufacturing sector in Nigeria.	Olanrewaju, Aremo & Aiyegbusi (2015)	Cointegration analysis and Error Correction Mechanism (ECM)	Financial deepening and interest rate spread negatively and significantly impacted on the output growth of manufacturing sector in Nigeria.
25.	Effect of financial sector development on manufacturing output growth.	Aiyetan & Aremo (2015)	Vector Auto-regression (VAR) technique.	A deepened financial system would enhance manufacturing sector growth.
26.	Relevance of financial sector development on real sector productivity.	Adeusi & Aluko (2015)	Ordinary Least Square.	Financial sector development promote real sector productivity.
27.	Effect of financial sector reforms on manufacturing sector growth.	Dada (2015)	Co-integration and Granger Causality techniques.	Financial reforms have direct effect on manufacturing sector growth.
28.	The impact of financial sector reforms on manufacturing sector performance.	Ogunsakim (2014)	Multivariate co-integration technique	Financial sector reforms do not have significant impact on manufacturing sector.
29.	Effect of global financial recession in manufacturing sector.	Atoyebi, Okafor &Falana (2014)	Diserecptive statistics	Financial crisis has negative effect on manufacturing export.
30.	The Nigeria experience of financial liberalization and investments	Agbaeze& Onwuka (2014)	Cointegration/Regresion analysis	Investment especially private sector investments have not improved following financial liberalization in the country in the late 1980s and the sequencing of the liberalization process and hostile macro-economic environment have combined to minimize the expected benefits of financial liberalization.
31.	Financial sector development and industrialization in Nigeria.	Ewetan & Ike (2014)	Multivariate VAR and vector error correction model	While Ratio of private sector bank credit to GDP has a positive relationship with industrial output, the ratio of broad money stock to GDP has a negative relationship with industrial output. Also, a long-run unidirectional causal link running from industrialization to financial development was found.

32.	Commercial bank credit and its contributions on manufacturing sector in Nigeria	Ogar, Nkamare & Effiong (2014)	Ordinary least square of multiple regression model	Commercial bank credit has a significant relationship on manufacturing sector
33.	Empirical investigation of the impact of monetary policy on manufacturing sector performance in Nigeria.	Imoughele & Ismaila (2014)	VAR model	Interest rate, exchange rate and external reserve impacted negatively on the sector output but broad money supply and inflation rate affect the sector positively. The pairwise Granger Causality results suggest that real exchange rate and external reserves granger cause manufacturingoutput in Nigeria.
34	The linkage between financial sector and economic growth.	Ugbaje & Ugbaje (2014)	Ordinary Least Square (OLS) and Granger Causality test.	Strong and positive relationship between financial sector and economic growth.
35.	The cause-effect relationship between financial deepening and economic growth.	Ayila, Akighir & Iorember (2014)	Autoregressive Distributed Lag (ARDL) technique.	Financial deepening has appositive and significant effect on economic growth.
36	The relationship between Financial Sector Development and Economic Growth in Nigeria	Garba (2014)	Autoregressive distributed lag model approach (ARDL)	Development in financial sector variables; banking sector credits, total market capitalization and foreign direct investment positively affect economic growth.
37	Economic liberalization and industrial sector performance in Nigeria	Edeme &Karimo (2014)	marginal impact estimation technique with standard errors	economic liberalization has a significant impact on performance of the Nigerian manufacturing, mining and quarrying, and power subsectors, respectively and the aggregate industrial sector
38	The impact of Financial sector development on economic growth.	Adekunle, Salami & Adedipe (2013)	Regression technique.	Financial sector has an insignificant impact on economic growth.
39	Macroeconomic variables and the productivity of the manufacturing sector in Nigeria: A static analysis approach.	Odior (2013)	Vector error correction model (VECM) techniques.	Credit to the manufacturing sector in the form of loans and advances and foreign direct investment have the capacity to sharply increase the level of manufacturing productivity in Nigeria with broad money supply has less impact.
40	Impact of financial deepening on economic growth.	Torruam, Chiawa & Abur (2013).	Granger Causality test technique.	Unidirectional causality from financial deepening to economic growth.

41	Financial sector development and economic growth nexus.	Emeka & Aham (2013).	Error Correction Mechanism.	A positive effect of financial sector development on economic growth.
42	An empirical analysis of trends in financial intermediation and output in Nigeria	Agbada & Osuji (2013)	Regression analysis	There exist a positive growth relationship between financial intermediation and output in Nigeria. There also exist elements of negative short-run growth relationship for the periods that suffered financial shocks resulting from the global financial crisis.
43	Effect of firm size on firm productivity	Babalola (2013)	Panel Data.	Firm size has positive impact on the profitability of manufacturing firms.
44	The influence of financial deepening on manufacturing output.	Maxwell & Oluwatosin (2012)	Vector Auto-regressive technique.	Financial deepening do not exert significant effect on manufacturing output.
45	The link between financial development and industrial production growth.	Elija & Uchechi (2012).	Autoregressive Distributed Lag technique.	Financial sector development exhibited a significant negative impact in industrial production.
46	The effect of Financial liberalization on economic growth.	Sulaiman & Azzez (2012).	Error Correction model approach.	Financial Liberalization has positive effect on economic growth.
47	Impact of financial deepening on economic growth.	Onwumere, Ibe, Ozoh & Mounanu (2012)	Multiple regression technique.	Broad money velocity and market liquidity promote economic growth, while money stock diversification, economic volacity and market capitalization did not.
48	Bank lending, economic growth and the performance of the manufacturing sector in Nigeria	Obamuyi, Edun & Kayode (2012)	Cointegration and vector error correction model (VECM) techniques.	Manufacturing capacity utilization and bank lending rates significantly affect manufacturing output in Nigeria.
49	Financial sector development and industrial production in Nigeria	Udoh & Ogbuagu (2012)	Autoregressive distributed lag model approach (ARDL)	Both the long run and short run dynamic coefficients of financial sector development variables have negative and statistically significant impact on industrial production.
50	Productivity in the Nigerian manufacturing sub-sector	Rasheed (2010)	Cointegration and error correction model	The presence of a long-run equilibrium relationship among index of manufacturing production, productivity, economic growth, interest rate spread, bank credit to the manufacturing subsector, inflation rates, foreign direct investment, exchange rate and quantity of graduate employment.
51	Financial deepening and economic development in Nigeria.	Nzotta & Okereke (2009)	Two stages least squares analytical framework	Financial deepening index is low in Nigeria over the years and that the nine explanatory variables had a statistical relationship with financial deepening.

52	Effect of financial development on economic development.	Agu & Chukwu (2008)	Autoregressive Distributed Lag (ARDL) procedure.	A Long-run relationship where public capital appears to curtail output growth.

2.5 Critique and Gaps identifiedfrom the reviewed literature

The vast majority of the old and recent literature on financial deepening focused on its effect on economic growth, with only a few dealing with its effect on manufacturing sector performance. The available few studies contributed immensely in explaining financial deepening and manufacturing sector performance nexus, suffer from a number of shortcomings. These include;

The use of cross countries sectional data by some of the studies which may not satisfactorily addressed countries specific issues. There are serious dangers in lumping together in cross sectional models, countries with very different experiences, which may reflect different institutional characteristics, different policies targets with different implementations and application. According to Nguena and Abimbola (2013), the use of cross-sectional data cannot account for the existence of countries specific macroeconomic shocks.

Besides, some of the studies suffer from methodological limitations in the sense that they failed to examine the stationarity of the time-series data used for their regression analysis. Gujarati (2006) emphasized that the use of non-stationary time series data for regression analysis lead to spurious results. This study takes cognizance of this and examined the stationarity of the included variables.

In addition, most of the studies applied static model for their analysis. However, financial deepening always reflect tendency to persist over time, showing sensitivity to macroeconomic shocks (Nguena & Abimbola, 2013). Therefore, static models which are formulation without lag

operators would be inappropriate for financial deepening. Apart from Agu and Chukwu (2008), andAyila, *et al,* (2014), who used Autoregressive Distributed Lag model,Imoughele and Ismaila (2014); Eweta and Ike (2014),adopted Vector Autoregressive (VAR),while others adopted different analytical techniques for their estimation, ignoring autoregressive tendency in manufacturing sector performance and the future effects of financial deepening strategies. According to Nguena and Abimbola (2013), the lagged or initial variable of financial deepening contributes significantly to the explanation of the current financial deepening. Besides, the different order of integration of the included variables for this study buttressed this fact and supported the use of ARDL model. Hence, this study adopted Autoregressive Distributed Lag (ARDL) model to analyze the effect of financial deepening on manufacturing sector performance in Nigeria.

The vast majority of the previous studies reviewed mainly used money-based and bank-based proxies of financial deepening (Fatima, 2004; Ndebbio, 2004; Agu & Chukwu, 2008; Nzotta & Okereke, 2009; Sulaiman & Azziz, 2012; Adu, Marbuah & Mensah, 2013; Ohwofasa & Aiyedogbon, 2013; Nguena & Abimbola, 2013; Luqman, 2014; Olanrewaju, Aremo & Aiyegbusi 2015, Frances, *et al*, 2016) and the capital market components were ignored. According to Nguena and Abimbola (2013), the financial markets deepening indicator has been neglected because the sub-region financial market is still in its infancy and there is dearth of statistical data. This assertion cannot hold for Nigeria due to the availability of financial market due to the availability of financial market deepening data.

Iyoyibo (2013) argued that stock market is better for the purpose of raising funds to finance growth because it provides greater opportunities for competition and thereby promoting entrepreneurship. Ibenta (2005), Ojo (2004) and Okaro (2002) emphasized the significant roles of capital market in financing long term productivity for growth and development. Besides, in

intermediation process, capital market has irreplaceable advantages and functions in resource allocation and re-allocation for manufacturing sector development and economic growth (Luo & Zhou, 2009).

The market also provides an avenue for growing firms to raise capital at reduced cost. As such, manufacturing firms and companies operating in a well-deepened financial systemwith developed financial market are less dependent on bank financing, which can greatly reduce the risk of credit crunch (Ojo, 2010). Further, Levine (2005), argued that stock markets and banks provide essential financial services for growth and development of a nation and that the services provided by them may be complementary. Therefore, the bank-based financial deepening measures commonly adopted in the previous studies cannot uni-laterally account for the intermediation ratio.

From the review, all the studies employed a single performance indicator for manufacturing sector, except Bayyurt and Sagbansua (2007) who utilized three performance indicators for manufacturing firms in Turkey. Robertson (1997), Kaplan and Norton (1996) observed that a single measure of performance cannot provide a clear concentration on the critical mission of an establishment. The use of a single performance indicator at a time by previous studies might not be appropriate to produce comprehensive findings.

Therefore, the use of a single performance indicator for manufacturing sector adopted by previous researchers might not be sufficient for policy prescription to make a strong case for the promotion of manufacturing sector in Nigeria.

Finally, the vast majority of previous authors who investigated causality relationship between financial deepening and manufacturing sector performance adopted the Granger Causality test procedure. Although, Granger causality test is widely used, it has many limitations. Among other limitations, it is a two variables causality procedure without any consideration for the effect

of other variables.Hence, there exists the possibility of specification bias. However, Agu and Chukwu (2008) applied Toda-Yamamoto framework, but they employed only the bank-based financial deepening proxies. Karimo and Ogbonna (2016) applied it to study causality between financial deepening and economic growth in Nigeria.

Based on the foregoing,this study employed ARDL procedure to investigate the effect of financial deepening on manufacturing firms performance in Nigeria, using three proxies for financial deepening and three indicators of performance for manufacturing firms. Toda-Yamamoto causality framework was utilized to examine the causal link between financial deepening and average capacity utilization of manufacturing firms in Nigeria.

2.6. **Strategies adopted to fill the identified Gaps**

Based on the identified gap in the literature, the following additions are made;

The ratio of market capitalization to gross domestic product is included as an index of financial deepening in the capital market. This is done in line with Levine and zervos (1998) who extended the work of King and Levine (1993) to include the independent impact of capital market, as well as banks, on real economic growth. However, Dada (2015), Kwode (2015), Onwumere, Onudugo and Ibe (2013) applied market capitalization as a proxy for financial deepening, but their studies were on economic growth and not manufacturing sub-sector.

Also, against the use of static models by many of the previous studies on the topic, this study utilized Auto-Regressive Distributed Lag dynamic model.

To the best of knowledge, the use of both bank-based and capital market-based intermediation ratios, together with monetization ratio, using ARDL model framework and Toda-Yamamoto causality procedure,to examine financial deepening and manufacturing sector performance nexus, clearly distinguished this study from the previous studies.

Also, this study utilized a three variable framework to measure manufacturing sector performance, which to the best of knowledge, has not been utilized by any previous author in Nigeria. This is done in line with King and Levine (1993) who used three growth indicators as explained in the theoretical framework and Bayyurt and Sagbansua (2007), who applied three performance indicators for manufacturing firms in Turkey. The three proxies are; index of manufacturing production, average capacity utilization and the contribution of manufacturing sector to GDP.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Research design

This research is a quantitative study of the "ex-post facto type" using regression design and investigating the effect of financial deepening on manufacturing sector performance in Nigeria. Financial deepening variables and aggregate value of performance indicators for the listed manufacturing firms in Nigeria stock exchange are utilized for the empirical analysis.

3.2 Sources of data

The study used time series data on manufacturing sub-sector, and financial deepening from 1986-2017, obtained from the publications of the National Bureau of Statistic (NBS), Central Bank of Nigeria, World Development Indicators and Nigerian Stock Exchange Fact-book.

3.3 Model specification

The study adopts the finance led growth hypothesis postulated by Levine and Zervos (1998), modified by King and Levine (1993) model and the Solow-Swan growth theory to produce the model contained in the theoretical framework. The research hypotheses and questions, as informed by the objectives of this research, necessitated dividing the model specification into different parts. For specific, four models are specified and each of the models capture the relationship between the identified variables contained in the objectives. Based on the foregoing, there is the need to remodel equation 2.4in the theoretical framework to achieve the specific objectives of this study, using the Auto-Regressive Distributive Lag (ARDL) framework of long run and short run analysis.

To ensure the robustness of the estimation, the choice of the controlled variables included in the estimation is based on the Nigerian specific dynamics, availability of data and as indicated by the literature, especially from Agu and Chukwu (2008), Rasheed (2010), Odior (2013), Nguena and Abimbola (2013), Imoughle and Ismaila (2014), Olanrewaju, Aremo and Aiyegbusi (2015), Karimo and Ogbonna (2016), Nwanna and Chinwudu (2016) models.

Model 1: In line with the first objective of the study which is to examine the effect of financial deepening on capacity utilization of manufacturing firm in Nigeria, the equation is specified in line with theoretical framework and based on the views of previous researchers as follows;

$CTSA_t = f(FDMS_t, FDPC_t, RCAP_t, RGCF_t, RFDI_t, INFR_t, INTR_t, EXCR_t, GEXP_t)$ ... (3.1)

The long-run econometric model is specified as:

$$CTSA_t = \alpha_0 + \alpha_1 FDMS_t + \alpha_2 FDPC_t + \alpha_3 RCAP_t + \alpha_4 RGCF_t + \alpha_5 RFDI_t + \alpha_6 INFR_t + \alpha_7 INTR_t + \alpha_8 EXCR_t + \alpha_9 GEXP_t + \mu_t \quad \ldots(3.2)$$

The short run-counterpart of equation (3.2) is thus specifies as:

$$CTSA_{t-1} = \alpha_0 + \alpha_1 FDMS_{t-1} + \alpha_2 FDPC_{t-1} + \alpha_3 RCAP_{t-1} + \alpha_4 RGCF_{t-1} + \alpha_5 RFDI_{t-1} + \alpha_6 INFR_{t-1} + \alpha_7 INTR_{t-1} + \alpha_8 EXCR_{t-1} + \alpha_9 GEXP_{t-1} + \in_{t-1} \quad \ldots (3.3)$$

Where:

CTSA= Average capacity utilization of manufacturing sector (proxy for manufacturing sector performance).

FDMS= Ratio of broad money supply to Gross domestic product (proxy for financial deepening in the economy)

FDPC= Ratio of private sector credit to Gross domestic product (proxy for bank based financial deepening)

RCAP= Ratio of market capitalization to GDP (proxy for capital market based financial deepening)

RGCF= Ratio of Gross capital formation to Gross domestic product (proxy for capital stock)

RFDI= Ratio of foreign direct investment to Gross domestic product

INFR= Inflation rate

INTR = Interest rate

EXCR = Exchange rate

GEXP = Growth in government expenditure

$\in_t$ = Error term

α_0 = Intercept

$\alpha_1, \alpha_2, \alpha_3, \alpha_4, \alpha_5, \alpha_6, \alpha_7, \alpha_8,$ and α_9 =Coefficients to be estimated (partial regression coefficients)

***A priori*expectations**

*A priori*expectation is the anticipated relationship between dependent variable and independent variables in a model as established by theory. The *a-priori* expectationof the independent variables in the first model is shown in table 3.1 as follows:

Table 3.1: *A priori* expectation on model 1

SYMBOL	VARIABLE	EXPECTED SIGN
FDMS	Ratio of Broad money supply to GDP	Positive (+)
FDPC	Ratio of Private sector credit to GDP	Positive (+)
RCAP	Ratio of Market capitalization to GDP	Positive (+)
RGCF	Ratio of Gross capital formationto GDP	Positive (+)
RFDI	Ratio of foreign direct investment to GDP	Positive (+)
INFR	Inflation rate	Negative (-)
INTR	Interest rate	Negative (-)
EXCR	Exchange rate	Positive (+)
GEXP	Growth in government expenditure	Positive (+)

Source: Author's design, 2018

Model 2 The model is specified in line with the theoretical framework and based on the views of previous researchers in a functional form to establish the effect of financial deepening on the index of manufacturing production in Nigeria:

$MFGI_t = f(FDMS_t, FDPC_t, RCAP_t, RGCF_t, RFDI_t, INFR_t, INTR_t, EXCR_t, GEXP_t)$ ….. (3.4)

The long-run form of equation (3.4) can thus be specified as:

$MFGI_t = \partial_0 + \partial_1 FDMS_t + \partial_2 FDPC_t + \partial_3 RCAPt + \partial_4 RGCF_t + \partial_5 RFDIt + \partial_6$

$INFR + \partial_7 INTR_t + \partial_8 EXCR_t + \partial_9 GEXP_t + \mu_t$ … (3.5)

The short-run model transformation of equation (3.5) is specified as:

$MFGI_{t-1} = \partial_0 + \partial_1 FDMS_{t-1} + \partial_2 FDPC_{t-1} + \partial RCAP_{t-1} + \partial_4 RGCF_{t-1} + \partial_5 RFDI_{t-1} +$

$\partial_6 INFR_{t-1} + \partial_7 INTR_{t-1} + \partial_8 EXCR_{t-1} + \partial_9 GEXPt_{-1} + \mu_{t-1} + \in_t$ … (3.6)

Where:

MFGI = Index of manufacturing production (proxy for performance of the manufacturing sector)

FDMS = Ratio of broad money supply to gross domestic product (proxy for financial deepening in the economy)

FDPC = Ratio of private sector credit to gross domestic product (proxy for bank-based financial deepening)

RCAP = Ratio of market capitalization to GDP (proxy for capital market-based financial deepening)

RGCF = Ratio of gross capital formation to gross domestic product

RFDI = Ratio of foreign direct investment to Gross Domestic Product

INFR = Inflation rate

INTR = Interest rate

EXCR = Exchange rate

GEXP = Growth in government expenditure

μ_t = Error term

∂_0 = Intercept

$\partial_1, \partial_2, \partial_3, \partial_4, \partial_5, \partial_6, \partial_7, \partial_8, \partial_9$= Coefficient to be estimated (partial regression coefficients)

***A priori*expectations**

The *a-priori* expectation of the independent variables in model 2is shown in table 3.2 as follows:

Table 3.2: ***A priori* expectation on model 2**

SYMBOL	VARIABLE	EXPECTED SIGNS
FDMS	Ratio of Broad money supply to GDP	Positive (+)
FDPC	Ratio of Private sector creditto GDP	Positive (+)
RCAP	Ratio of Market capitalization to GDP	Positive (+)
RGCF	Ratio of Gross capital formation to GDP	Positive (+)
RFDI	Ratio of foreign direct investment to GDP	Positive (+)
INFR	Inflation rate	Negative (-)
INTR	Interest rate	Negative (-)
EXCR	Exchange rate	Positive (+)
GEXP	Growth in government expenditure	Positive (+)

Source: Author's design, 2018

Model 3: To investigate the effect of financial deepening on the contribution of manufacturing sector to GDP, the model adopted the finance led growth hypothesis as enunciated in the theoretical framework. The modified model based on the views of previous researchers is therefore specified in a functional form as stated below:

$RMSP_t = f(FDMS_t, FDPC_t, RCAP_t, RGCF_t, RFDI_t, INFR_t, INTR_t, EXCR_t, GEXP_t)$……(3.7)

The long-run equation from equation (3.7) is specified as:

$RMSP_t = \beta_0 + \beta_1 FDMS_t + \beta_2 FDPC_t + \beta_3 RCAP_t + \beta_4 RGCF_t + \beta_5 RFDI_t + \beta_6 INFR_t +$

$\beta_7 INTR_t + \beta_8 EXCR_t + \beta_9 GEXP_t + \mu_t$ …….. (3.8)

The short- run counterpart of equation (3.8) is thus specified as:

$RMSP_{t-1} = \beta_0 + \beta_1 FDMS_{t-1} + \beta_2 FDPC_{t-I+} \beta_3 RCAP_{t-1} + \beta_4 RGCF_{t-1} + \beta_5 RFDI_{t-1}$

$+ \beta_6 INFR_{t-1} + \beta_7 INTR_{t-1} + \beta_8 EXCR_{t-1} + \beta_9 GEXP_{t-1} + \mu_{t-1}$ …….... (3.9)

Where:

RMSP = Contribution of Manufacturing Sector to GDP (proxy for performance of the manufacturing sector)

FDMS = Ratio of broad money supply to GDP (proxy for financial deepening in the economy)

FDPC = Ratio of Private sector credit to GDP (proxy for bank based financial deepening)

RCAP = Ratio of Market capitalization to GDP (proxy for capital market-based financial deepening)

RGCP = Ratio of Gross capital formation to GDP (proxy for capital stock)

RFDI = Ratio of foreign direct investment to GDP

INFR = Inflation rate

INTR = Interest rate

EXCR = Exchange rate

GEXP = Growth in government expenditure

U_t = Error term

β_0 = Intercept

$\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6, \beta_7$ and β_8, = Coefficient to be estimated (partial regression coefficients)

***A priori* expectations**

The expected signs of the independent variables are shown in table 3.3 as follow:

Table 3.3***A priori*** **expectation on model 3**

SYMBOL	VARIABLE	EXPECTED SIGN
FDMS	Ratio of Broad money supply to GDP	Positive (+)
FDPC	Ratio of Private sector creditto GDP	Positive (+)
RCAP	Ratio of Market capitalization to GDP	Positive (+)
RGCF	Ratio of Gross capital formation to GDP	Positive (+)
RFDI	Ratio of foreign direct investment to GDP	Positive (+)
INFR	Inflation rate	Negative (-)
INTR	Interest rate	Negative (-)
EXCR	Exchange rate	Positive (+)
GEXP	Growth in government expenditure	Positive (+)

Source: Author's design, 2018

Model 4: Specification on causal link between financial deepening and manufacturing firms performance in Nigeria.

Many tests of causality have been developed and adopted in empirical studies to establish the direction of causation such as Granger (1969) and Sims (1972) tests. Granger (1969) developed the meaning of causality statistically, when he explained that an economic time series, Yt causes another Xt, if its inclusion produces a better prediction of Xt than when it was excluded. . The test is premised on null hypotheses formulated on zero restrictions in the coefficients of the lags of subset of the variables in a model. Hence, the test is based on asymptotic theory.

The usual shortcomings in using Granger causality test among others are the likely presence of stochastic trends in the variables of interest. Also, the traditional F tests and its Wald test counterpart to establish whether some parameters of a stable Vector Auto regressive Model are jointly zero are not appropriate for non- stationary processes, because the test statistics do not have a standard distribution. Besides, it is a two- variable causality test without any consideration for

the effect of other variables. As such, there exists the possibility of specification bias (Toda & Phillips, 1994). To deal with these problems, this study adopted Toda and Yamamoto (1995) non-causality test procedure. They developed a technique that has become attractive to researchers because the power of traditional unit root test techniques are very weak and Toda-Yamamoto causality methodology can be applied irrespective of the integration and cointegration properties of the variables included in the model (Oladipo, 2008). The procedure involves using a modified Wald Statistic for testing the significance of parameters of a ARDLs model, where s is the lag length in the system. The lag length of the variables in the causal model is dictated by Akaike Information Criterion (AIC).

The Toda and Yamamoto (1995) models to achieve the fourth objective are presented in equations 3.10 and 3.11.

$$X_{st} = \varphi + \sum_{i=1}^{n} \theta_i \, X_{st-i} + \sum_{i=m+1}^{n+ d_{max}} \theta_i \, X_{st-1} + \sum_{i=1}^{n} \sigma_i \, Y_{st-1} + \sum_{i=n+1}^{n+ d_{max}} \sigma_i \, Y_{st-1} + V_1 \quad \ldots\ldots\ldots 3.10$$

$$Y_{st} = \varphi + \sum_{i=1}^{n} \emptyset_i \, Y_{st-i} + \sum_{i=n+1}^{n+ d_{max}} \emptyset_i \, Y_{st-1} + \sum_{i=1}^{n} \beta \, X_{st-1} + \sum_{i=n+1}^{n+ d_{max}} \beta \, X_{st-1} + V_{2t} \ldots\ldots\ldots\ldots 3.11$$

Where X_s = financial deepening variables

Y_s =manufacturing sector performance proxies

$\theta'^s, \sigma'^s, \varphi, \emptyset'^s \; and \; \beta'^s$ are parameters of the model

$d_{max}$is the maximum order of integration suspected in the system;

$V_t \sim N(0, \sum_{V_1})$ and $V_{2t} \sim N(0, \sum_{V_2})$ are the model residuals.

Also, $\sum_{V_1} and \sum_{V_2}$ are the covariance matrices of V_{1t} and V_{2t} respectively

The n is the lag length. The null of non-causality from financial deepening to manufacturing sector performance can be expressed as;

$$H_o: \sigma_i = 0 \ \forall \ i = 1, 2, \ldots n$$

3.4 Description of variables

3.4.1 Dependent variables

Three dependent variables as used in this study, flowing from equations 3.1 to 3.9, namely; average capacity utilization of manufacturing firms (CTSA), index of manufacturing production (MFGI), and manufacturing sector contribution to gross domestic product (RMSP) in Nigeria are proxies for manufacturing sector performance (MPS). The components of the dependent variables adopted in this research have previously been used individually by authors in various studies, and also in varying combinations (King & Levine, 1993; Rasheed, 2010; Odior, 2013;Imoughele & Ismaila, 2014; Olanrewaju, Aremo & Aiyegbusi, 2015).

The choice of these dependent variables is reinforced by literature favoured by their relevance to Nigerian dynamic, and this study in particular.

3.4.1.1 **Index of manufacturing sector production (MFGI)**

This is the real production output of the manufacturing sector, which is basically the level of manufacturing sector production that could be sustainably maintained. Manufacturing production indexes are generally computed as indexes using the weights based of value added annual estimates.

3.4.1.2 **Average capacity utilization of manufacturing sector (CTSA):**

This is the level of manufacturing firms usage of their installed plant and machinery. It is also described as the ratio of actual output in relation to the potential output; that is, the comparison of the extent of production in the short-run with the existing capital stock. On a

general note, it is the relationship between goods and services provided by manufacturing firms with the installed equipment and the potential output which the equipment could produce with fully utilized capacity.

3.4.1.3 **Ratio of manufacturing sector contribution to Gross Domestic Product (RMSP)**

This is the percentage contributed by manufacturing firms to the total output of a economy. It is measured by manufacturing sector productivity as percentage of real gross domestic product.

3.4.2 **Independent variables**

The independent variables used for this study are the financial deepening variables and the controlled variables.

3.4.2.1 **Financial deepening variables**

The capital market, bank and money based financial deepening components used in this study follows the lead provided by various authors, but more specifically the work of King and Levine (1993), Nzotta and Okereke (2009), Ohwofasa and Aiyedogbon (2013), Nguena and Abimbola (2013), Karimo and Ogbonna (2016), Nwanna and Chinwudu (2016).As suggested by these authors, the main measurable indicators of financial deepening are the market capitalization, bank credit, credit provided to private sector and money supply. For this study, market capitalization is measured through the capitalization of manufacturing firms listed on the Nigerian Stock Exchange.

3.4.2.1.1 **Ratio of broad money supply to Gross Domestic Product (FDMS):**

This is a measure of the money supply that includes more than just physical money such as currency and coins, also known as narrow money. It generally includes demand deposits at commercial banks, and any monies held in easily accessible accounts. The quantitative relation

between broad money and gross domestic product is used for this study as money-based financial deepening index.

3.4.2.1.2 Ratio of private sector credit to Gross Domestic Product (FDPC):

It meansfinancial resources like loans and non-equity securities provided to the private sector by financial institutions like banks and other financial corporations all measured as percentages with respect to GDP. This is applied as bank-based financial deepening variable.

3.4.2.1.3 Ratio of manufacturing sector market capitalization to Gross Domestic Product (RCAP):

It is the total market value of manufacturing firm's outstanding shares. It is computed by taking the stock price and multiplying it by the total number of shares outstanding. The product, as a ratio of GDP is used in this study as capital market financial deepening index.

3.4.2.2 Control Variables

The control variables used in this study (as informed by theory) are carefully chosen because financial deepening variables are not the only determinants of manufacturing sector performance. They are included in order to have a well-specified model.

In the studies conducted by Imoughele and Ismaila (2004), Odior (2013), Olanrewaju, Aremo and Aiyegbusi (2015) to investigate financial deepening and manufacturing sector productivities, control variables such as inflation rate, exchange rate and interest rate were adopted. These control variables have also been used in similar studies by Eweta and Ike (2014),Nguena and Abimbola (2013) and Rasheed (2010).

To ensure comparability and due to availability of relevant data, gross capital formation, exchange rate, foreign direct investment, Interest rate, government expenditure and inflation rate are used in this study. These variables were chosen based on their appropriateness from economic theory.

3.4.2.2.1 **Ratio of Gross capital formation to Gross Domestic Product (RGCF):**

It is measured by the total value of the gross fixed capital formation, changes in inventories and acquisitions less disposals of valuables for the manufacturing sector. It is expressed as a ratio of GDP for the purpose of this study. An increase in gross capital formation should enhance manufacturing firm operations and productivity.

3.4.2.2.2 **Foreign direct investment (RFDI):**

This is an investment in the form of a controlling ownership of a business in one country by an entity based in another country. Foreign Direct Investment (FDI) stocks measure the total level of direct investment at a given point in time.The introduction of FDI as a control variable in this regard is premised on the fact that an increase in FDI would culminate in an increase in inflow of revenue from abroad for the manufacturing sector (Jeffus, 2004; Bénassy-Quéré, Coupet & Mayer, 2007).

3.4.2.2.3 **Inflation rate (INFR):**

It is a persistent rise in the general price level. Apart from acting as a proxy for risk and uncertainty, it also discourages financial intermediation. It is the rate at which prices rise and purchasing power falls. Inflationismeasuredas apercentage rateof change in the level of prices.Inflation rate is also depicted as annual percentage increase in consumer prices. It measures the purchasing power of a currency relative to price adjustments of a basket of household items over a year (Hill, 2013).

The inclusion of this variable in this study helps to accommodate the possible negative effects of financial exposures in the reported financial deepening figures that do not necessarily translate into an increase in the real capital base of the manufacturing firms. The use of this control variable in financial development and manufacturing sector performance estimation is a general practice as indicated in the reviewed literature.

3.4.2.2.4 **Interest rate (INTR):**

Interest rate is the amount of interest due per period, as a proportion of the amount lent, deposited or borrowed (called the principal sum). Using measures of countries' interest rate in manufacturing sector performance estimation helps to produce a well-specified model because developing countries generally adopt free-market lending rate policies to improve financial stability and manufacturing sector performance by encouraging competition in the domestic market (Hill, 2013).

3.4.2.2.5 **Exchange rate (EXCR):**

This is included as a measure of external sector distortions which influences the nominal value of international trade. It is the rate at which one currency is exchanged for another. It is also regarded as the value of one country's currency in relation to another currency. Exchange rates are determined in the foreign exchange market, which is open to a wide range of different types of buyers and sellers.

The variable is related to manufacturing sector productivity in Nigeria because it determines to a large extent, the price of inputs and outputs of manufacturing firms. The lose of value of a currency makes exports more competitive, stimulating in this way the flows of funds for manufacturing firm productivity.

3.4.2.2.6 **Growth in government expenditure (GEXP):**

Government expenditure involves government disbursements on consumption and gross investment. It is a measure of government spending on goods and services that are included in the Gross Domestic Product. It inclusion as a control variable is premised on the fact that an increase in government expenditure should stimulate the economy and provide the necessary infrastructure for manufacturing sector performance. For the purpose of this study, it is measured as percentage increase in government annual expenditure.

3.5 Methods of data analysis

For the purpose of this study, Descriptive Statistics, Stationary and Co-integration tests were carried out to examine the behaviours of the included variables. Autoregressive Distributed lag (ARDL) analytical technique was applied for the short and long runs estimate of the variables in the models formulated. The statistical properties are done with the probability of the parameter estimate, student "t", "R^2" and "F" tests. The Breusch-Godfrey (BG) and Breusch – Pagan – Godfrey (BPG) test were used as post diagnostic tests to investigate the presence of auto-correlation and heteroscedasticity in the error terms respectively.

With the use of *a priori* expectations, a one-tail test is the most appropriate (Gujarati, 2006, Brooks, 2000). Therefore, a one tail-test using 5 percent level of significance is applied for this study. Estimates with a probability greater than 0.05 is considered insignificant, while with a probability of less than 0.05 is significant. For t statistics, the degree of freedom is 10 with 32 observations. Therefore, the table value for the parameter estimate is 1.812. An estimate with student t statistic that is less than 1.82 is not significant, while an estimate with "t" statistic that is greater than 1.812 is significant. Ramsey-Reset specification error test was used to examine the stability of the ARDL models.Finally, Toda-Yamamoto causality test procedure was used to establish the causal link between financial deepening and manufacturing sector performance in Nigeria.

3.5.1 Stationarity Test

Gujarati (2006), view regression analysis based on time series data as implicitly assuming that the underlying time series are stationary. If a time series is stationary, its **mean, variance,** and **auto covariance** (at various lags) remain the same, no matter at what point we measure them. Hence, they are time invariant. In practice, most economic time series are non-stationary. A non-

stationary time series will have a time-varying mean or time-varying variance or both, and we can only study it for the time under consideration. Each set of time series data, will therefore be for a particular episode and as a consequence, it is not possible to generalize it to other time periods. Therefore, for the purpose of forecasting, such (non-stationary) time series may be of little practical value.

In the course of this research work, the researcher tested the stationarity of the variables of the model using the Phillip Perron and Augmented Dickey- Fuller unit root tests procedure.

3.5.2 Bound Cointegration Test

Due to the non-stationarity of the time series, we conducted cointegration test. The notion of cointegration arose out of the concern about spurious or nonsense regression in time series data (Gujarati, 2006). The implication of the test is that if time series is nonstationary individually, linear combinations of such time series might produce a stationary time series. Specifying a relation in terms of levels of the economic variables i.e. $y_t = \alpha + \beta x_t + \mu_t$, usually produces empirical results in which $\mathbf{R^2}$ is very high**,** but the **Durbin-Watson statistic** is very low. This frequently occurs, because economic time series are dominated by smooth, long term trends. Then the problem then is to find a way to work with the nonstationary series in a way that allow us to capture both short run and long run effects. Cointegration is then the link between integrated process and steady state equilibrium. Nonstationary time series are said to be cointegrated if a linear combination of the series result in a stationary time series. Therefore, to examine the cointegration of the variables, bound cointegration testwas conducted.

3.5.3Auto-Regressive Distributed Lag Model

For the purpose of this study, Auto-regressive Distributed lag model is used. The idea behind the choice of this method lies in the fact that financial deepening have both short and long-run effect. The choice is buttressed by the fact that some of the variables in the model are stationary at level and the other became stationary at first difference. Nguena and Abimbola (2013), emphasized that the lagged or initial variable of financial deepening contributes significantly to the explanation of the current financial deepening. This means that the effect of financial deepening will be felt beyond the year of its adoption, and therefore the present performance/productivity of manufacturing firms can also influence the future performance

ARDL model is a standard least squares regression that include lags of both the dependent variable and explanatory variables as regressors (Brooks, 2008). This has gained popularity as a method of examining cointegrating relationship between variable through the work of Pesaran and Shin (1998) and Pesaran, Shin and Smith (2001).

The ARDL approach has the additional advantage of producing consistent estimates of the long-run coefficients that are asymptotically normal irrespective of whether the underlying regressors are stationary at level 1 (0), or stationary after first differencing 1(1) (Pesaran & Shin, 1998).ARDL can be represented mathematically as;

$$y_t = \alpha_\circ + \alpha_1 t + \sum_{i=1}^{p} \emptyset y_{t-1} + \beta' x_t + \sum_{i=0}^{q-1} \beta_i' \Delta x_{t-1} + \mu_t \qquad \ldots\ldots.3.12$$

Where, $y_t$represent the regressive vector containing observation on the manufacturing sector performance proxies, and $\mu_t$represents the financial deepening proxies. Also, $y_{t\text{-}1}$ and x_{t-1} represent the lags of manufacturing sector performance and financial deepening variables respectively.

3.6 Test of Model Adequacy

According to Gujarati (2006), hypothesis testing presumes that the model employed for empirical analysis is adequate in the sense that it does not violate the assumptions underlying the classical normal linear regression model. Therefore, test of model adequacy is necessary for test of hypothesis. If the models are deemed practically adequate, they could be used for forecasting purposes.

For the purpose of this study, Durbin-Watson test for serial correlation, Breusch-Pagan-Godfrey (BPG) test for heteroscedasticity, Breusch-Godfrey (BG) serial correlation Lagranger Multiplier (LM) test for higher order Autoregressive Moving Average (ARMA) errors, Ramsey-Regression specification Error Test and Jarque-Bera test for normal distribution are employed.

CHAPTER FOUR

DATA PRESENTATION, ANALYSIS AND FINDINGS

4.1 Data presentation

The data used for this study is presented in appendix 1. The data are arranged and analyzed for the purpose of achieving the objectives of the study.

4.2 Data analysis and findings

4.2.1 Descriptive statistics

The statistical properties of the variables are examined in order to know the normality condition, the extent of dispersion and the volatility if present. The descriptive statistics are presented in tables 4.1 and 4.2.

Table 4.1: Descriptive Statistics

	CTSA	EXCR	INFR	FDMS	GEP	INTR
Mean	47.77375	95.59903	19.37375	14.71700	23.57767	18.86438
Median	48.55000	115.2551	12.71000	13.09785	20.65715	18.13500
Maximum	72.20000	305.5112	72.73000	21.87510	106.0714	29.80000
Minimum	29.30000	2.020575	5.400000	9.151700	-26.02530	10.50000
Std. Dev.	12.15063	79.04839	17.32316	4.081379	27.26267	3.776921
Skewness	0.127056	0.556082	1.718557	0.517036	1.181045	0.889019
Kurtosis	1.885554	2.847539	4.896312	1.721932	5.050149	4.529777
Jarque-Bera	1.742084	1.680203	20.54634	3.603685	13.04343	7.335517
Probability	0.418515	0.431667	0.000035	0.164995	0.001471	0.025534
Sum	1528.760	3059.169	619.9600	470.9440	754.4855	603.6600
Observations	32	32	32	32	32	32

Source: E-view 5.0 version output data (see appendix 2)

From the result in table 4.1, we verified the normality condition of the variables using the Jarque-Berra statistics (JB). The JB statistics tests for the normality of the distribution with the null hypothesis of normal distribution against the alternative hypothesis of not normally distributed. If the probability value as presented in table 4.1 exceeds 5%, then the null hypothesis of normal distribution is accepted, otherwise the null hypothesis of normal distribution is

rejected.Based on the result of the JB probability, we hereby conclude that average capacity utilization of manufacturing sector (CTSA), exchange rate (EXCR) andfinancial deepening measured by the ratio of broad money supply to GDP (FDMS),are normally distributed as their respective probabilities are greater than 5% while the null hypothesis is rejected for growth in government expenditure (GEP) interest rate (INTR) and inflation rate (INFR) as their probabilities are less than 5%.

The result from table 4.1 suggests that the level of financial inclusion is relatively low but non-volatile; this is evidenced as only on average, the financial deepening ratio proxy by the ratio of broad money supply to GDP (FDMS) was 14.72% with a standard deviation of 4.08. Also, the result reveals that exchange rate is highly volatile as the minimum rate recorded for the period was 2.02 in 1986 while the maximum was 305.50 naira per dollar in 2017. Further, the result shows that growth in government expenditure was erratic with minimum and maximum values of -26.03 and 106.07 in 2000 and 1993 respectively. This could be attributed to the various types of government dispensation over the period. Further, the results show that average capacity utilization of manufacturing sector, exchange rate, inflation rate, financial deepening measured by the ratio of broad money supply to GDP, Growth in government expenditure and Interest rate are positively skewed toward normality during the study period. The less than 3 Kurtosis statistics show that CTSA, EXCR and GEP are Platykurtic while INFR GEP and INTR with Kurtosis values grater than 3 are leptokurtically distributed.

Table 4.2: Descriptive Statistics Continues

	MFGI	RFDI	FDPC	RCAP	RGCF	RMSP
Mean	127.0438	3.136874	0.088314	0.094808	0.128527	0.078499
Median	135.7500	2.749500	0.031204	0.026317	0.129655	0.076895
Maximum	182.7000	10.83250	0.342895	0.307105	0.192448	0.099798
Minimum	78.20000	0.078060	0.001001	0.000446	0.070324	0.060490
Std. Dev.	26.78783	2.348648	0.109143	0.110126	0.028953	0.013833
Skewness	0.023364	1.535680	1.017303	0.734161	0.111158	0.164115
Kurtosis	2.246907	5.619486	2.520608	1.902476	2.585509	1.445681
Jarque-Bera	0.759110	21.72661	5.825923	4.480702	0.294970	3.364857
Probability	0.684166	0.000019	0.054315	0.106421	0.862875	0.185922
Sum	4065.400	100.3800	2.826044	3.033842	4.112853	2.511952
Observations	32	32	32	32	32	32

Source: E-view 5.0 version output data (see appendix 2)

From the result in table 4.2, we verified the normality condition of the variables using the Jarque-Berra statistics (JB). The JB statistics is employed to test the normality of the distribution with the null hypothesis of a normal distribution against the alternative hypothesis of not normally distributed. If the probability value as presented in table 4.2 exceeds 5%, then the null hypothesis of normal distribution is accepted, otherwise the null hypothesis of normal distribution cannot be accepted. From the result of the JB probability, it is hereby concluded that Index of manufacturing production, (MFGI), and Manufacturing sector contribution to GDP (RMSP) are normally distributed as their respective probabilities are greater than 5% while the null hypothesis is rejected for Ratio of private sector credit to GDP, (FDPC), Ratio of market capitalization to GDP, (RCAP), Ratio of foreign direct investment to GDP (RFDI) and Ratio of Gross capital formation(RGCF), as their probabilities are less than 5%.

The result also shows that on the average, the index of manufacturing production is erratic with a standard deviation of 26%, minimum and maximum values of 78.2 in 1986 and 182.7 in 1992 respectively. The result further showed that the maximum amount of foreign direct investment inflow was about 10.8% of GDP in 1994. Also, the result reveals that on the average, over the period, the manufacturing sector contributed only about 7.8% to GDP and this is very low

because following the argument of growth theories such as the Rostow stages of growth theory, there must be an emergence of the manufacturing sector which is a component of the industrial sector for growth to take place. This implies that the manufacturing sector must be emphasized to be in the centre stage for development.

Further, from table 4.2, Ratio of private sector credit to GDP (FDPC), Ratio of market capitalization to GDP (RCAP), Ratio of foreign direct investmentto GDP (RFDI), Ratio of Gross capital formation (RGCF),Manufacturing sector contribution to GDP (RMSP)and Index of manufacturing production (MFGI) are positively skewed toward normality during the study period. The Kurtosis values reveal that all the variables are Platykurtic in nature except for RFDI, as evidenced by the less than 3 values of the Kurtosis statistics. The greater than 3 Kurtosis statistic shows that RFDI is up to Kurtically distributed.

4.2.2 Unit Root Test

The study applied Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests to examine the stationarity of the time series and test the null hypothesis of unit root. It is expected that the series do not contain unit root in order to find long run relationship among the variables. The test is carried out using 5% Mackinnon Critical value. The variables of Index of manufacturing production (MFGI), Ratio of private sector credit to GDP (FDPC), Ratio of market capitalization to GDP (RCAP), Ratio of foreign direct investment (RFDI), Ratio of Gross capital formation (RGCF), Manufacturing sector contribution to GDP (RMSP), Average capacity utilization of manufacturing sector (CTSA), Exchange rate (EXCR), Ratio of broad money supply to GDP (RMSP), Growth in government expenditure (GEP), Inflation rate (INFR) and Interest rate (INTR) are tested. The levels of integration of the variables are reported in table 4.3 and table 4.4.

Table 4.3 Augmented Dickey-Fuller (ADF) Unit Root Test Result

Variable	Method	At Level			At First Difference			Order of integration
		ADF statistics	5% critical value	Prob	ADF statistics	5% C.Value	Prob	
CTSA	ADF	-1.124376	-2.960411	0.6933	-3.395503	-2.963972	0.0192	I (1)
EXCR	ADF	1.779038	-2.960411	0.9995	-3.151292	-2.963972	0.0333	I (1)
FDMS	ADF	-0.466101	-2.960411	0.8849	-4.889081	-2.963972	0.0004	I (1)
GEP	ADF	-0.277565	-2.986225	0.9152	-3.062119	-2.986225	0.0428	I (1)
INFR	ADF	-3.562543	-2.991878	0.0148	-	-	-	I (0)
INTR	ADF	-4.631820	-2.960411	0.0008	-	-	-	I (0)
MFGI	ADF	-2.280138	-2.960411	0.1843	-5.998021	-2.963972	0.0000	I (1)
FDPC	ADF	2.918922	-2.960411	1.0000	-3.467470	-2.963972	0.0162	I (1)
RCAP	ADF	-0.658500	-2.960411	0.8427	-5.690353	-2.963972	0.0001	I (1)
RFDI	ADF	-3.295890	-2.960411	0.0238	-	-	-	I (0)
RGCF	ADF	-1.625888	-2.960411	0.4578	-5.799929	-2.967769	0.0000	I (1)
RMSP	ADF	-0.943154	-2.963972	0.7600	-4.491788	-2.963972	0.0013	I (1)

Source: E-view 5.0 version output data (see appendix 3A)

Table 4.4 Phillips-Perron (PP) Unit Root Test Result

Variable	Method	At Level			At First Difference			Order of integration
		PP test statistics	5% critical value	Prob	PP test statistics	5% C.Value	Prob	
CTSA	PP	-1.203369	-2.960411	0.6602	-3.395503	-2.963972	0.0192	I (1)
EXCR	PP	1.779038	-2.960411	0.9995	-3.151292	-2.963972	0.0333	I (1)
FDMS	PP	-0.558201	-2.960411	0.8659	-4.972826	-2.963972	0.0004	I (1)
GEP	PP	-6.911447	-2.960411	0.0000	-	-	-	I (0)
INFR	PP	-2.620309	-2.960411	0.0998	-5.049407	-2.963972	0.0003	I (1)
INTR	PP	-4.731632	-2.960411	0.0006	-	-	-	I (0)
MFGI	PP	-2.566180	-2.960411	0.1106	-6.025924	-2.963972	0.0000	I (1)
FDPC	PP	3.107799	-2.960411	1.0000	-3.463798	-2.963972	0.0163	I (1)
RCAP	PP	-0.263926	-2.960411	0.9194	-7.019509	-2.963972	0.0000	I (1)
RFDI	PP	-3.295890	-2.960411	0.0238	-	-	-	I (0)
RGCF	PP	-1.639021	-2.960411	0.4513	-6.536880	-2.963972	0.0000	I (1)
RMSP	PP	-0.994069	-2.960411	0.7429	-4.540563	-2.963972	0.0011	I (1)

Source: E-view 5.0 version output data (see appendix 3B)

From tables 4.3 and 4.4, the ADF and PP unit root tests reported Interest rate (INTR) and Ratio of foreign direct investment (RFDI) as stationary at levels as their ADF and PP test statistics are significant at 5% levels. This implies that the variables are integrated of order zero at 5% significant level. The tests reported Index of manufacturing production (MFGI), Ratio of private

sector credit to GDP (FDPC), Ratio of market capitalization to GDP (RCAP), Manufacturing sector contribution to GDP (RMSP), Average capacity utilization of manufacturing sector (CTSA), Exchange rate (EXCR), Ratio of broad money supply to GDP (FDMS) and Ratio of gross capital formation (RGCF) as stationary at first difference. The result implies that the variables are integrated of order one at 5% significant level. Further, while PP test reveals Growth in government expenditure as stationary at level, ADF test shows that it became stationary after first differencing. Besides, with ADF test, Inflation rate (INFR) is stationary at level, but with PP test, it became stationary after first differencing. This finding implies that while some of the series are stationary at levels, others contain unit root but became stationary after first differencing.

4.2.3 Co-Integration Test

For robustness, Engle Granger test and the ARDL bound test are used to test the long run co-movement among the variables. Before any useful conclusion could be made on the relationships between the series, it is important that co-integration first exists.

4.2.3.1 Engle Granger Co-integration Test

Engle Granger (1987) test was carried out to test the long run co-movement among the economic variables. The procedure is to regress the long run relationship and test the stationarity of the error term (Gujarati, 2006). It is expected that the error term should be stationary at level for co integration to exist. Engle-Granger test helps to show if the variables of interest are particularly co-integrated. Engle The -Granger test result is presented in table 4.5.

Table 4.5: Engle-Granger Co-Integration Test Result

Equation	Dependent Variable	tau-statistic	Prob.*	z-statistic	Prob.*
Effect of financial deepening on capacity utilization of manufacturing sector **(Model 1)**	CTSA	-6.056886	0.0226	-28.33742	0.0423
Effect of financial deepening on the index of manufacturing production **(Model 2)**	MFGI	-10.007816	0.0012	-42.63255	0.0002
Effect of financial deepening on the contribution of manufacturing sector to economic growth **(Model 3)**	RMSP	-8.048621	0.0126	-36.20046	0.0065

Source: E-view 5.0 version output data

Table 4.5 reveals that for the three equations, the error terms are stationary at levels using the tau-statistic and z-statistic at 5% significant level. The probabilities of the three equations are less than 0.05. This implies that the three equations of interest are co-integrated. There exists a long-run or equilibrium relationship between the variables in the models. Although the variables may deviate from their relationship in the short run, their association would return in the long run.

4.2.3.2 ARDL Bounds Test for Co-Integration

From tables 4.3 and 4.4, it is observed that some of the variables are stationary at level and others are stationary at first difference. With this scenario, there is a practical difficulty that has to be addressed when we conduct F-test, becauseexact critical values for the F-test are not available for an arbitrarily mix of I(0) and I(1) variables. However, Peseran et al. (2001) prescribes a technique to investigate the appropriate order in which the variables are co-integrated. They supplied bound for the critical value for the asymptotic distribution of the F-statistic. For various situation (e.g. different numbers of variables, (k+1)), they give lower and upper bound on the critical values. In each case, the lower bound is based on the assumption that all the variables are I(0), and the upper bound is based on the assumption that all the variables are I(1). If the computed

F-statistic falls below the lower bound we would conclude that the variables are I(0), so no co integration is possible, by definition. If the F-statistics exceeds the upper bound, we conclude that we have co-integration. Finally, if the test statistic falls between the bounds, the test is inconclusive. The result of the test is presented in table 4.6.

Table 4.6: ARDL Bounds Wald statistic Result

	Model 1		Model 2		Model 3	
LOS	**I(0)**	**I(1)**	**I(0)**	**I(1)**	**I(0)**	**I(1)**
10%	1.88	2.99	1.88	2.99	1.88	2.99
5%	2.14	3.30	2.14	3.30	2.14	3.30
2.5%	2.37	3.60	2.37	3.60	2.37	3.60
1%	2.65	3.97	2.65	3.97	2.65	3.97
F-Stat	73.31909		5.453927		4.370299	
D.F	9		9		9	

Source: E-view 9.0 version output data (see appendix 4,5 and 6)

Table 4.6 shows that for the three equations estimated, computed ARDL F-statistics are greater than the 5% upper bound critical values,ie 73.32 > 3.30, 5.45 > 3.30 and 4.37> 3.30. Hence, it is hereby concluded that the variables are I(1), and are cointegrated.

Therefore, the null hypotheses of long run relationship among the variables of the three models are hereby accepted. The implication of this is that the variables will sustain their togetherness in the long run and will not wander apart from one another. Although, the variables may deviate from their relationship in the short run, their association would return in the long run.

Thus, it is concluded that, with the support of macroeconomic variables included, there exist long run relationship between financial deepening and manufacturing sector performance in Nigeria within the period examined. As a result, the financial deepening variables will be able to explain the variations in the performance of the manufacturing sector even in the long run.

4.2.4 Presentation of Results according to Objectives

This section presents the ARDL regression results of the models specified in chapter three.

3.2.4.1 Objective one: To investigate the effectof broad money supply, private sector credit and market capitalization on capacity utilization of manufacturing sector in Nigeria

In order to examine this objective, an ARDL estimation technique is employed for the empirical analysis. This estimation technique is employed because some of the variables are stationary at levels and the others are stationary at first difference.

Table 4.7: ARDL Long and Short Run Result
Dependent Variable: CTSA

Long Run Estimates				Short Run Estimates			
Variable	**Coefficient**	**t-stat**	**Prob**	**Variable**	**Coefficient**	**t-stat**	**Prob**
FDMS	4.475358**	5.979540	0.0055	$\Delta CTSA_{t-1}$	1.665685*	17.08052	0.0372
FDPC	-8.956261	-0.261797	0.8370	$\Delta FDMS_t$	3.991528**	9.451384**	0.0071
RCAP	-107.816921**	-5.249143	0.0098	$\Delta FDMS_{t-1}$	3.919045**	9.946752**	0.0038
RGCF	76.723348	0.887073	0.5381	$\Delta FDPC_t$	-79.886036**	-3.098339	0.0088
RFDI	-6.499928**	-9.893540	0.0041	$\Delta FDPC_{t-1}$	-171.747162**	-11.172411	0.0068
INFR	0.232036	1.489004	0.1503	$\Delta RCAP_t$	26.492505**	4.552497	0.0077
EXCR	0.436343**	9.030840	0.0002	$\Delta RCAP_{t-1}$	69.734653**	8.858642	0.0016
GEP	1.627695**	8.887390	0.0013	$\Delta RFDI_t$	2.842312**	8.040304	0.0028
INTR	0.077182	0.526273	0.6916	$\Delta RFDI_{t-1}$	-0.709363**	-5.308441	0.0085
C	34.836324**	6.054476	0.0042	$\Delta INFR_t$	0.470559	1.038241	0.5717
				$\Delta INFR_{t-1}$	0.032760	1.052097	0.4838
				$\Delta RGCF_t$	-175.396972**	-8164041	0.0076
				$\Delta RGCF_{t-1}$	-346.393246**	-7.827752	0.0079
				$\Delta EXCR_t$	0.146310**	7.198525	0.0028
				$\Delta EXCR_{t-1}$	0.366014**	8.709812	0.0009
				ΔGEP_t	0.311267**	10.600510	0.0099
				ΔGEP_{t-1}	0.217018**	8.553455	0.0041
				$\Delta INTR_t$	-1.262894**	-11.318465	0.0061
				$\Delta INTR_{t-1}$	-0.222630*	-2.778232	0.0200
				$CointEq_{t-1}$	-0.665685**	-6.826164	0.0026

** Implies significant at 5% ** Implies significant at 1%*

Source: E-view 9.0 version output data (see appendix 4)

Table 4.8: Statistical Properties and Post Diagnostic Results

Statistical Properties of Results		Post Diagnostic Tests Result	
R-squared	0.9699	BPG Heteroscedasticity (F-Stat)	2.7057
Adj R-squared	0.9476	BPG Heteroscedasticity Prob. F(28,1)	0.6519
F-statistic	430.0954	BPG Heteroscedasticity Obs* R-squared	29.6092
Prob(Fstatistic)	0.0000	Prob. Chi-Square (28)	0.5821
Durbin-Watson Stat	2.1727	Scaled explained SS	0.0722
Akaike Info Criterion:	0.370542	Prob. Chi-Square (28)	1.0000
Model Evaluated	19683	B-G Serial Correlation LM (F-Stat)	1.0505
ARDL Best Model	(1,1,1,0,1,1,1,0,1,1)	B-G Serial Correlation LM Prob. F(2,10)	0.3854
		Obs* R-Squared	5.3822
		Prob. Chi-Square (2)	0.0678
		Ramsey RESET (F-Stat)	0.6946
		Ramsey RESET Prob. (F – Stat.)	0.3418
		Ramsey RESET (t – Stat.)	0.6942
		Ramsey RESET Prob. (t – Stat.)	0.4826
		Jarque-Bera Statistics for Normality	0.4377
		Jarque-Bera Prob	0.8243

Source: E-view 9.0 version output data (see appendix 4)

From Table 4.7, the results show that the lagged value of average capacity utilization of manufacturing sector ($CTSA_{t-1}$) capture important dynamic structure in its present value. The result indicates that a – unit increase in the previous values of average capacity utilization would lead to an increase of 1.67 units in its current values. With a probability of 0.037, the effect is statistically significant at 5% level.

The ARDL results show that a direct and significant link is established between ratio of broad money supply to gross domestic product (FDMS) and average capacity utilization of manufacturing sector both in the long-run and short run. A unit increase in the ratio of broad money supply to gross domestic product will lead to 4.48 units increase in average capacity utilization of manufacturing sector in the long-run. Also, a unit increase in current and previous values of the ratio of broad money supply to gross domestic product will lead to 3.99 and 3.92 units increase in the current value of average capacity utilization of manufacturing sector in Nigeria respectively. The probability values of 0.055, 0.0071 and 0.0038 show that the direct effect is statistically significant at 1% level. The result is in consonance with the*a priori*

expectation and the findings of Imoughele and Ismaila (2014), but contradictsthe findings of Ewetan and Ike (2014) that a negative relationship exists between broad money supply and average capacity utilization of manufacturing sector in Nigeria.

The result further shows that in the long-run, a unit increase in the ratio of credit to private sector to gross domestic product (FDPC) will lead to 8.96 units decrease in average capacity utilization of the manufacturing sector. The result of the short-run reveals that a unit increase in the current value of ratio of credit to private sector to gross domestic product will lead to 79.89 units decrease in average capacity utilization of the manufacturing sector, while a unit increase in the previous value of ratio of private sector credit to GDP will lead to171.75 units decrease in the average capacity utilization of the manufacturing sector. The probability estimates reveal that the negative effect is statistically significant in the short-run but non-significant in the long run. Thus, estimate for the long-run has the same direction of effect with the short-run. This fails to agree with the *a priori* expectation and the finding of Ewetan and Ike (2014) where private sector credit produced a positive relationship with industrial output.

In the long-run, a unit increase in market capitalization (RCAP) will lead to 107.82 units decrease in average capacity utilization of manufacturing sector. However, in the short-run, a unit increase in the current and previous values of market capitalization will lead to 26.49 and 69.73 units increase in average capacity utilization of the manufacturing sector respectively. This result,with a probability value of 0.0098, indicates that market capitalization has indirect and significant effect on average capacity utilization of the manufacturing sector in the long-run. In the short-run, the result with probabilities values of 0.008 and 0.0016 reveal that market capitalization has direct and significant effect on average capacity utilization of manufacturing sector in Nigeria. Thus, the result implies that capital markets have not being providing the long-term financing required for manufacturing sector productivity.

The ratio of foreign direct investment to gross domestic product has an indirect and significant effect on average capacity utilization of the manufacturing sector, as a unit increase in the ratio of foreign direct investment to gross domestic product will lead to 6.50 units decrease in average capacity utilization of the manufacturing sector in the long run. Similarly, a unit increase in the previous value of ratio of foreign direct investment to gross domestic product will lead to 0.71 unit decrease in current value of average capacity utilization of the manufacturing sector. However, a unit increase in the current value of ratio of foreign direct investment to GDP will lead to 2.84 units increase in the average capacity utilization of manufacturing sector. The probability values indicate that the effect is statistically significant at 1% level.

This result is contrary to the *a priori* expectation that foreign direct investment should affect the performance of manufacturing sector positively. However, the negative relationship may be an indication that the manufacturing sector has not been able to attract foreign direct investment, hence low FDI inflows into the manufacturing sector in Nigeria. The result contradicts the findings of Odior (2013), that posits that foreign direct investment is positively related to manufacturing output in Nigeria.

The ARDL results also show that both in the long run and short-run, inflation rate has a positive effect on average capacity utilization of the manufacturing sector. A unit increase in inflation rate will lead to 0.23 unit increase in average capacity utilization of the manufacturing sector in the long-run. In the short-run, a unit increase in the current and previous values of inflation rate will lead to 0.47and 0.03 units increase in average capacity utilization of the manufacturing sector respectively. This result is not in consonance with the *a priori* expectation of indirect relationship. The implication of the results is that inflation rate has not affected the performance of manufacturing sector adversely overtime, though with probabilities of 0.15, 0.57 and 0.48 for long-run, short-run present value and previous values respectively, the variable

proved to be statistically insignificant. The result, although contrary to the *a priori*, it corroborates the finding of Imoughele and Ismaila (2014).

Further, the result shows that exchange rate has a direct effect on the average capacity utilization of manufacturing sector in Nigeria. A unit increase in exchange rate will lead to 0.44 unit increase in average capacity utilization of manufacturing sector. Also, in the short run, a unit increase in the current and previous values of exchange rate will lead to 0.15 and 0.37 units increase in average capacity utilization of manufacturing sector. The probability values of 0.0002, 0.008 and 0.003 for long-run, short-run current period and previous period respectively, indicate that the direct effect is statistically significant at 1% level. The finding is in agreement with the "*a priori*" that devaluation is expected to make manufacturing firms' products competitive in the international market and thereby promotes manufacturing sector productivity through exportation.

Also, the result indicates that government expenditure has a positive effect on average capacity utilization of manufacturing sector both in the long-run and short-run. A unit increase in government expenditure will cause 1.63 units increase in average capacity utilization of manufacturing sector in the long run. A unit increase in the present and previous values of government expenditure, will lead to 0.31 and 0.22 units increase in the current value of average capacity utilization of manufacturing sector respectively. The probability values of 0.0013, 0.0099 and 0.0041 for long-run, current and previous values respectively, indicate that the direct effect is statistically significant at 1% level. This finding indicates that government capital and recurrent expenditures overtime affected manufacturing sector positively.

In the long-run, interest rate produced a direct effect on average capacity utilization of manufacturing sector. A unit increase in interest rate, will lead to 0.08 unit increase in the average capacity utilization of manufacturing sector in the long-run. The 't' statistic of 0.53 and the probability value of 0.69 show that the direct effect is not significant. However, a negative

relationship is maintained in the short-run. A unit increase in the current and previous values of interest rate will lead to 1.26 and 0.22 units decrease in the current value of average capacity utilization of manufacturing sector respectively. The 't' statistic values of 11.32, 2.78 and the probability value of 0.0061; 0.0200 for short-run current and previous values estimation respectively, indicates that the negative effect is statistically significant. The implication of this finding is that, an increase in the cost of funds in the short-run, will adversely affect the average capacity utilization of manufacturing sector. This finding is in line with the *a priori* expectation.

The result also show that a unit increase in gross capital formation to gross domestic product will lead to 76.72 units increase in average capacity utilization of manufacturing sector in the long-run, indicating a direct relationship. The 't' statistic of 0.89 and the probability value of 0.54 indicate that the positive effect of the variable is not statistically significant in the long run. In the short-run, a unit increase in the current and previous values of gross capital formation will lead to 175.4 and 3416.40 units decrease in the current value of average capacity utilization of manufacturing sector. The result is contrary to the *a priori* and it implies that domestic investment prevailing in the Nigerian economy is counter-productive in stimulating manufacturing sector productivity in the short-run.The 't' statistics and probability values for the short-run estimate, indicate that the negative effect is statistically significant at 1% level. This could be due to the use of an increase in gross capital formation in the short-run for importation as against productive investment in the manufacturing sector.

Besides, the intercept term (c) shows the mean or average effect of all the variables excluded from the model. Therefore, on the average, a unit increase in the value of the excluded variables will lead to 34.84 units increase in average capacity utilization of the manufacturing sector. In other words, given that all the included explanatory variables are held constant, the average capacity utilization of manufacturing sector would be 34.84 units. However, with a

probability of 0.004, the direct effect is statistically significant at 1% level. The implication of this finding is that apart from financial deepening and the controlled variables included, there are other significant explanatory variables causing variation in average capacity utilization of manufacturing sector in Nigeria.

It is also important to examine the statistical properties of the estimated results. From table 4.8, it is evident that the R-squared value of 0.97 indicates that about 97% variation in average capacity utilization of manufacturing sector is explained in the model by financial deepening and the controlled variables. The F-statistic of 430.1 with a probability of 0.000, is statistically significant and this shows that there is a considerable harmony between average capacity utilization of manufacturing sector and the explanatory variables put together. This confirms that broad money supply, private sector credit, market capitalization and the controlled variables jointly have significant influence on the average capacity utilization of manufacturing firms.

Also, the Breusch-Pagan-Godfrey (BPG) testis applied to investigate the presence of heteroscedasticity in the regression result. The BPG tests the null hypothesis of no heteroscedasticity (ie. homoscedasticity) against the alternative hypothesis of heteroscedasticity. The result in table 4.8 presents three different types of tests for heteroscedasticity. The "F" test statistic is 2.7057 and chi-square (X^2) test statistic is 29.6092, with probability values of 0.65 and 0.58 respectively. Both test statistics give the same conclusion that there is no evidence for the presence of heteroscedasticity, since the probability values are considerably in excess of 0.05.

The "scaled explained sum of square" (SESS), which is the third test is based on a normalized version of the explained sum of squares from the auxiliary regression. The SESS statistics of 0.07225, with a probability value of 1.000, which is greater than 0.05 suggests the absence of heteroscedasticity.

Therefore, the "f" test, chi-square (X^2) test and the "scalled explained sum of square (SESS) test produced the same result that the model is homoscedastic.

The B-G Serial Correlation Lagranger Multiplier (LM) test is used to test for higher order Autoregressive Moving Average (ARMA) errors and is applicable whether or not there is lagged dependent variable(s). The B-G tests the null hypothesis of no serial correlation against the alternative hypothesis of serial correlation. Table 4.8 presents "F" statistic and chi-square (X^2)statistic for BG serial correlation LM test. The result of "F" statistic's probability for the B-G Serial Correlation is 0.1106and the probability of chi-square is 0.068. Since the probabilities are greater than 5%, hence the null hypothesis of no auto-correlation cannot be rejected, implying that the model has no serial correlation.

Also, the Durbin-Watson statistic of 2.173 indicates that there is no serial correlation associated with the regression result as this is in line with "two" as a benchmark. Therefore, this finding is in agreement with the result of Breusch-Pagan-Godfrey test.

In the model, the error correction term $CointEq_{t-1}$ is well specified and correctly signed. The coefficient of the lag of co-integrating equation ($CointEq_{t-1}$) is approximately -0.6657. It means that about 66.57 percent departure from long run equilibrium is corrected in the short run. The negative sign in the lag of co-integrating equation confirms the existence of long-run relationship. Hence, about 66.57% of the variations in the short run converge. The zero (0) probability shows that the estimate is statistically significant at 1% level.

The Ramsey RESET test is used to examine whether the relationship between the dependent variable and the explanatory variables is linear or not. The results of this test as shown in table 4.8, is for one fitted term. Both F and t versions of the test are presented.From the result, the "t" statistic is 0.4532 and "F" statistic is 0.0942. The probability of "F" statistic is 34% and 48% for "t" statistic. Since the probabilitiesare higher than 5%, the estimates are non-significant at

5% level. Hence, there is no apparent non-linearity in the regression equation and it is hereby concluded that the linear model specified for the relationship is appropriate.

The Jarque-Bera (JB) statistic for the normality distribution of the model is 0.44, with a probability of 82%. Since the probability of obtaining the JB statistic under the normality assumption is very high and greater than 0.05, the null hypothesis that the error terms are normally distributed cannot be rejected at 5% level.

Finally, based on the results of adequacy tests and the statistical characteristics of the model, it is hereby concluded that the inferences we made about the coefficients estimate are appropriate and valid, and that the model is fit for forecasting purposes.

4.2.4.2 Objective Two: To establish the effectof broad money supply, private sector credit and market capitalization on the index of manufacturing production in Nigeria

In order to examine this objective, an ARDL estimation technique is also employed. This estimation technique is employed owing to the fact that some of the variables are stationary at levels and the others are stationary at first difference.

Table 4.9: ARDL Long and Short Run Result
Dependent Variable: MFGI (Index of Manufacturing Production)

Long Run Estimates				Short Run Estimates			
Variable	**Coefficient**	**t-stat**	**Prob**	**Variable**	**Coefficient**	**t-stat**	**Prob**
FDMS	-5.529123**	-3.714116	0.0026	$\Delta FDMS_t$	-3.093347	-1.749221	0.1038
FDPC	-92.207478	-1.147660	0.6826	$\Delta FDPC_t$	210.749192	2.012730	0.0653
RCAP	-102.005063*	-2.469800	0.0281	$\Delta RCAP_t$	-111.845204*	-2.175809	0.0486
RGCF	41.260763	0.318486	0.7552	$\Delta RFDI_t$	2.123573	1.477991	0.1632
RFDI	0.240085	0.140855	0.8901	$\Delta INFR_t$	0.038220	0.217340	0.8313
INFR	-0.208559	-1.074380	0.3022	$\Delta RGCF_t$	-331.15296*	-2.531522	0.0251
EXCR	-0.092449	-1.369646	0.1940	$\Delta EXCR_t$	0.103136	0.762571	0.4593
GEP	0.502236*	0.193032	0.0219	ΔGEP_t	0.361483**	0.077069	0.0088
INTR	6.731719**	9.475952	0.0000	$\Delta INTR_t$	3.186527**	4.765530	0.0004
C	93.598239**	5.210304	0.0002	$CointEq_{t-1}$	-0.696467**	-3.918504	0.0012

** Implies significant at 5%* *** Implies significant at 1%*
Source: E-view 9.0 version output data (see appendix 5)

Table 4.10: Statistical Properties and Post Diagnostic Results

Statistical Properties of Results		Post Diagnostic Tests Result	
R-squared	0.9612	BPG Heteroscedasticity (F-Stat)	0.3989
Adj R-squared	0.9104	BPG Heteroscedasticity Prob. F(17,13)	0.9611
F-statistic	18.9370	BPG Heteroscedasticity Obs* R-squared	10.6270
Prob(F-statistic)	0.000	Prob. Chi-Square (17)	0.8753
Durbin-Watson Stat	2.1503	Scaled explained SS	2.4222
Akaike Info Criterion:	7.2088	Prob. Chi-Square (28)	1.0000
Model Evaluated	512	B-G Serial Correlation LM (F-Stat)	3.2968
ARDL Best Model	(1,1,1,0,1,1,1,0,1,1)	B-G Serial Correlation LM Prob. F(2,11)	0.0755
		Obs* R-Squared	4.6181
		Prob. Chi-Square (2)	0.0630
		Ramsey RESET (F-Stat)	0.0774
		Ramsey RESET Prob. (F – Stat.)	0.7857
		Ramsey RESET (t – Stat.)	0.2781
		Ramsey RESET Prob. (t – Stat.)	0.7857
		Jarque-Bera Statistics for Normality	4.6730
		Jarque-Bera Prob.	0.0967

Source: E-view 9.0 version output data (see appendix 5)

From Table 4.9, the result of the Autoregressive Distributed Lag Model (ARDL) reveals a negative effect of ratio of broad money supply to gross domestic product (FDMS) on index of manufacturing production. A unit increase in the ratio of broad money supply to gross domestic product will induce 5.53 units decrease in index of manufacturing production in the long-run, while a unit increase in the ratio of money supply to gross domestic product will induce 3.09 decrease in index of manufacturing production in the short-run. This result with probabilities of 0.003 and 0.104 for long-run and short-run respectively, shows an indirect and significant effect of ratio of broad money supply to gross domestic product on index of manufacturing production in the long-run and an indirect but insignificant effect on the index of manufacturing production in the short-run. This finding implies that available money in circulation did not arouse manufacturing production in Nigeria. With the negative effect, monetary policy will become ineffective and counter- productive on manufacturing production. The result is in line with the

findings of Olanrewaju *et al.* (2015) that an indirect relationship exists between ratio of money supply to gross domestic product and the index of manufacturing production.

The ratio of credit to private sector to gross domestic product (FDPC), being an indicator of financial deepening in the banking sector, shows that in the long-run, a unit increase in the ratio of credit to private sector to gross domestic product will lead to 92.21 units decrease in index of manufacturing production in the long-run, while a unit increase in the ratio of credit to private sector to gross domestic product will lead to 210 units increase in index of manufacturing production in the short-run. The result with probabilities of 0.7 and 0.07 for long-run and short-run respectively, implies that in the long-run, ratio of credit to private sector to gross domestic product has indirect and insignificant effect on index of manufacturing production while there is direct and insignificant relationship in the short-run. The implication of this findings is that with this negative relationship in the long-run, credit to private sector has not been significantly effective in improving manufacturing production and hence, the result does not conform with the *a priori* expectation. The likely reason for this may be that a larger chunk of loans from banks go to other sectors with a small portion going to the manufacturing sub-sector.

The ratio of market capitalization to gross domestic product (RCAP), being an indicator of financial deepening in the capital market is indirectly related to index of manufacturing production in the long-run. The result shows that a unit increase in market capitalization will stimulate 102.01 units decrease in index of manufacturing production in the long-run, while a unit increase in ratio of market capitalization to gross domestic product will stimulate 111.85 units decrease in index of manufacturing production in the short-run. The findings, with probabilities of 0.028 and 0.049for long-run and short-run respectively, show an indirect and significant effect of market capitalization on the index of manufacturing production both in the long-run and short-run. The implication of the result is that the aggregate valuation on current share price and total number of

outstanding stocks of listed manufacturing firms have not affected manufacturing sector performance positively. This result contradicts the findings of Obamuyi, EdunandKayode (2012).This could be due to the shallow nature of the Nigerian capital market and the stringent conditions for listing by manufacturing firms.

From the result, exchange rate produced direct and indirect effects on index of manufacturing production in the short-run and long-run respectively. A unit increase in exchange rate will lead to 0.1 unit increase in index of manufacturing production in the short-run. However, a unit increase in exchange rate will produce 0.09 unit decrease in index of manufacturing production in the long-run. With probabilities of 0.19 and 0.46 for long-run and short-run estimate, both are statistically non-significant. Although, non-significant, the short-run estimate of a direct relationship support the *a priori* that devaluation will enhance manufacturing sector productivity. Based on the result, devaluation would be detrimental to manufacturing sector performance in the long-run.

In addition, the result shows a direct and indirect effect of inflation rate on index of manufacturing production in the short-run and long-run respectively. A unit increase in inflation rate will reduce index of manufacturing production by 0.21 units in the long-run. In the short-run, a unit increase in inflation rate will increase manufacturing production by 0.04 units. The probabilities of 0.3 and 0.8 for long-run and short-run respectively, reveals that both estimate are statistically non-significant. The implication of the finding is that an increase in inflation rate is needed to promote manufacturing sector performance in the short-run, but this will be detrimental to manufacturing production in the long-run. This finding of a negative effect of inflation on manufacturing production in the long-run is in line with the *a priori.* However, the short-run direct effect negate the *a priori,* but corroborates the finding of Imoughele and Ismaila (2014), that positive relationship exist between inflation rate and manufacturing sector performance.

Furthermore, a unit increase in ratio of gross capital formation to gross domestic product will lead to 41.25 units increase in index of manufacturing production in the long-run and a unit increase in gross capital formation will lead to 331.15 units decrease in index of manufacturing production in the short-run. This implies that ratio of gross capital formation to gross domestic product has a direct effect on index of manufacturing production in the long-run and an indirect effect in the short-run. With probabilities of 0.76 and0.03 for long-run and short-run respectively, the ratio of gross capital formation to gross domestic product proved statistically significant in the short-run and insignificant in the long-run.

The result also shows that both in the short-run and long-run, a unit increase in the ratio of foreign direct investment to gross domestic product will lead to 2.12 and 0.24 units increase in index of manufacturing production respectively. With probabilities of 0.89 and 0.16, ratio of foreign direct investment to GDP reveals a direct and statistically insignificant effect on index of manufacturing production in both the long-run and short-run respectively. The implication of this is thatan increase in foreign direct investment has not significantly enhanced the performance of manufacturing sector.

Also, in the long-run, a unit increase in interest rate will induce 6.73 units increase in index of manufacturing production, while a unit increase in interest rate will induce 3.19 units increase in index of manufacturing production. Thus, with zero (0) probability for both long-run and short-run estimates, interest rate has direct and significant effect on index of manufacturing production.

The result does not conformwith the *a priori* expectation of an indirect relationship. The implication of this finding is that the manufacturers believed that irrespective of the rate, they will break even and hence, they can acquire the loan even at increased rate of interest.

The ARDL result further shows that a unit increase in government expenditure will lead to 0.50 unit increase in index of manufacturing production in the long-run while the short-run results

show that a unit increase in government expenditure will lead to 0.36 unit increase in index of manufacturing production. The probabilities of 0.02 and 0.01 for long-run and short-run estimate respectively, shows that government expenditure has direct and significant effect on index of manufacturing production both in the short-run and long-run. The reason may be that the funds expended on infrastructures and funds released by the federal government on improving the sub-sector via subsidy and palliatives yielded positive results on the index of manufacturing production.

Furthermore, the intercept term (c) shows the mean or average effect of all the variables excluded from the model. Thus, on the average, a unit increase in the value of the excluded variables will lead to 93.6 units increase in the manufacturing sector contribution to gross domestic product. In other words, given that all the included explanatory variables are held constant, the manufacturing sector contribution to gross domestic product would be 93.6 units. However, with a probability of 0.0002, the direct effect is statistically significant at 1% level. The implication of this finding is that apart from financial deepening and the controlled variables included, there are other significant explanatory variables causing variation in the manufacturing sector contribution to GDP in Nigeria.

It is also important to examine the statistical properties of the estimated result. From table 4.10, it is evident that the R-squared value of 0.961 indicates that about 96.1% variation in Index of Manufacturing Production is explained in the model by the explanatory variables. The F-statistics of 18.937 is statistically significant and this shows that there is a considerable harmony between Index of Manufacturing Production and the explanatory variables put together. This confirms that financial deepening and the controlled variables jointly have significant influence on index of manufacturing production in Nigeria.

Also, the Breusch-Pagan-Godfrey (BPG) test is applied to investigate the presence of heteroscedasticity in the regression result. The BPG tests the null hypothesis of no heteroscedasticity (ie. homoscedasticity) against the alternative hypothesis of heteroscedasticity. The result in table 4.10 presents three different types of tests for heteroscedasticity. The "F" test statistic is 0.3989 and chi-square (X^2) test statistic is 10.6270, with probability values of 0.96 and 0.88 respectively. Both test statistics give the same conclusion that there is no evidence for the presence of heteroscedasticity, since the probability values are considerably in excess of 0.05.

The "scaled explained sum of square" (SESS), which is the third test is based on a normalized version of the explained sum of squares from the auxiliary regression. The SESS statistics of 2.4222, with a probability value of 1.000, which is greater than 0.05, suggests the absence of heteroscedasticity.Therefore, the "f" test, chi-square (X^2) test and the "scalled explained sum of square (SESS) test produced the same result that the model is homoscedastic.

The B-G Serial Correlation Lagranger Multiplier (LM) test is used to test for higher order Autoregressive Moving Average (ARMA) errors and is applicable whether or not there is lagged dependent variable(s). The B-G tests the null hypothesis of no serial correlation against the alternative hypothesis of serial correlation. Table 4.10 presents "F" statistic as 3.30 and observed *R square statistic as 4.62 for BG serial correlation LM test. The result of "F" statistic's probability for the B-G Serial Correlation is 0.076and the probability of chi-square is 0.063. Since the probabilities are greater than 5%, hence the null hypothesis of no auto-correlation cannot be rejected, implying that the model has no serial correlation.

Also, theDurbin-Watson statistic of 2.258 indicates that there is no serial correlation associated with the regression result as this is in line with "two" as a benchmark. Therefore, this finding is in agreement with the result of Breusch-Pagan-Godfrey test.

In the model, the error correction term $CointEq_{t-1}$ is well specified and correctly signed. The coefficient of the lag of co-integrating equation ($CointEq_{t-1}$) is approximately -0.69647, which implies that about 69.65 percent departure from long run equilibrium is corrected in the short run. The negative sign in the lag of co-integrating equation confirms the existence of long-run relationship. Hence, about 69.65% of the variations in the short run converge. The zero (0) probability shows that the estimate is statistically significant at 1% level.

The Ramsey RESET test is used to examine whether the relationship between the dependent variable and the explanatory variables is linear or not. The results of this test as shown in table 4.10, is for one fitted term. Both "F" and "t" statistics versions of the test are presented. From the result, the "t" statistic is 0.2781and "F" statistics is 0.0774. The probability of 0.79 for both "t" and "F" statistic which is higher than 0.05, shown that the estimates are not significant at 5% level. Since the probabilities are higher than 5%, the estimates are non-significant at 5% level. Hence, there is no apparent non-linearity in the regression equation and it is hereby concluded that the linear model specified for the relationship is appropriate.

The Jarque-Bera (JB) statistic for the normality distribution of the model is 4.673, with a probability of 0.096. Since the probability of obtaining the JB statistic under the normality assumption is greater than 0.05, the null hypothesis that the error terms are normally distributed cannot be rejected at 5% level.

Finally, based on the results of adequacy tests and the statistical characteristics of the model, it is hereby concluded that the inferences we made about the coefficients estimate are appropriate and valid, and that the model is fit for forecasting purposes.

4.2.4.3 Objective Three: To evaluate the effect of broad money supply, private sector credit and market capitalization, on the contribution of manufacturing sector to economic growth in Nigeria

In order to examine this objective, an ARDL estimation technique is equally employed to conduct the empirical analysis. This estimation technique is employed owing to the fact that some of the variables are stationary at levels and the others are stationary at first difference. The result is presented in table 4.11.

Table 4.11: ARDL Long and Short Run Result
Dependent Variable: RMSP

Long Run Estimates				Short Run Estimates			
Variable	**Coefficient**	**t-stat**	**Prob**	**Variable**	**Coefficient**	**t-stat**	**Prob**
FDMS	0.000929	0.612993	0.5593	$\Delta RMSP_{t-1}$	0.460013**	3.744980	0.0072
FDPC	-0.574837**	-4.794580	0.0020	$\Delta FDMS_t$	0.000502	0.642388	0.5411
RCAP	-0.113691	-1.536851	0.1682	$\Delta FDPC_t$	0.141968	1.853273	0.1063
RGCF	-0.983927*	-3.231083	0.0144	$\Delta RCAP_t$	0.014148	0.722924	0.4932
RFDI	-0.015957**	-5.615581	0.0008	$\Delta RCAP_{t-1}$	0.039592	1.828678	0.1102
INFR	0.001273**	6.045716	0.0005	$\Delta RFDI_t$	-0.004827**	-4.482828	0.0029
EXCR	-0.000097	-1.041593	0.3322	$\Delta INFR_t$	0.000687**	4.606535	0.0025
GEP	0.002473**	4.442807	0.0030	$\Delta RGCF_t$	-0.146392	-1.064170	0.0779
INTR	0.000487	0.732457	0.4877	$\Delta RGCF_{t-1}$	0.323891*	3.226726	0.0145
C	0.124233**	5.771930	0.0007	$\Delta EXCR_t$	-0.000175*	-2.550994	0.0380
				$\Delta EXCR_{t-1}$	-0.000509**	-5.247982	0.0012
				ΔGEP_t	0.000232*	2.785086	0.0271
				$\Delta INTR$	0.000805*	2.759148	0.0281
				$\Delta INTR_{t-1}$	0.000705*	2.378487	0.0490
				$CointEq_{t-1}$	0.539987**	-4.396053	0.0032

** Implies significant at 5% ** Implies significant at 1%*
Source: E-view 9.0 version output data (see appendix 6)

Table 4.12: Statistical Properties and Post Diagnostic Results

Statistical Properties of Results		Post Diagnostic Tests Result	
R-squared	0.9906	BPG Heteroscedasticity (F-Stat)	0.7900
Adj R-squared	0.9610	BPG Heteroscedasticity Prob. F(22,7)	0.6883
F-statistic	33.4978	BPG Heteroscedasticity Obs* R-squared	21.3864
Prob(F-statistic)	0.000041	Prob. Chi-Square (28)	0.4970
Durbin-Watson Stat	2.0936	Scaled explained SS	1.4530
Akaike Info Criterion:	-8.8803	Prob. Chi-Square (28)	1.0000
Model Evaluated	19683	B-G Serial Correlation LM (F-Stat)	1.8298
ARDL Best Model	(1,2,1,2,2,0,2,1,0,2)	B-G Serial Correlation LM Prob. F(2,5)	0.2288
		Obs* R-Squared	12.7395
		Prob. Chi-Square (2)	0.8201
		Ramsey RESET (F-Stat)	1.7716
		Ramsey RESET Prob. (F – Stat.)	0.2315
		Ramsey RESET (t – Stat.)	1.3310
		Ramsey RESET Prob. (t – Stat.)	0.2315
		Jarque-Bera Statistics for Nomality	1.3645
		Jarque-Bera Prob	0.5055

Source: E-view 9.0 version output data (see appendix 6)

From Table 4.11, the ARDL result shows that there exist a direct relationship between the previous value of manufacturing sector contribution to gross domestic product and its present value. A unit increase in the previous value of manufacturing sector contribution to GDP will lead to 0.46 unit increase in its present value. With a probability of 0.007, the estimate of the direct effect is statistically significant at 1% level.

Also, a direct effect of the ratio of broad money supply to gross domestic product (FDMS) on manufacturing sector contribution to GDP is established. A unit increase in ratio of broad money supply to gross domestic product will lead to 0.0009 unit increase in the contribution of manufacturing sector to gross domestic product in the long-run, while in the short-run, a unit increase in the ratio of broad money supply to gross domestic product will lead to an increase of 0.0005 unit in the contribution of manufacturing sector to gross domestic product. The probabilities of 0.56 and 0.54 for the long-run and short-run estimate respectively, show that the direct effect is statistically non-significant at 5% level. Therefore, the result indicates that the ratio

of broad money supply to gross domestic product has a direct and non-significant effect on the contribution of manufacturing sector to gross domestic product both in the long-run short-run. The result aligns with the *a priori* expectation and the findings of Imoughele and Ismaila (2014). The non-significant recorded could be as a result of the financial shock caused by the global financial crises and recession witnessed between 2015 and 2017 in Nigeria.

The result also show that in the long-run, a unit increase in the ratio of credit to private sector to gross domestic product (FDPC) will induce approximately 0.57 unit decrease in the contribution of manufacturing sector to gross domestic product. The short-run result shows that a unit increase in the ratio of credit to private sector to gross domestic product will induce 0.14 units increase in the contribution of manufacturing sector to gross domestic product. While the long-run estimate is statistically significant with a probability of 0.002, the short-run estimate, with a probability of 0.11 is statistically non-significant. The short-run result is in line with the findings of Ogar, Nkramare and Effiong (2014), and Odior (2013). However, the long-run result reveals an existence of a significant indirect effect of credit to private sector on contribution of manufacturing sector to gross domestic product. In line with the *apriori,*the short-run credit to private sector has direct effect on the contribution of manufacturing sector to gross domestic product. The significant negative effect in the long run could be because Nigerian banks usually avoid long-term credit facilities for short-term loans. Also, because of the high risk involved, banks are usually reluctant to advance long-term credit to the manufacturing sector.

The result reveals that in the long-run, a unit increase in the ratio of market capitalization to gross domestic product (RCAP) will lead to 0.114 unit decrease in the contribution of manufacturing sector to gross domestic product. The probability of 0.17, shows that a negative and non-significant relationship exist between ratio of market capitalization to gross domestic product and the contribution of manufacturing sector to gross domestic product. However, in the

short-run, a unit increase in the previous and current values of ratio of market capitalization to gross domestic product will lead to 0.04 and 0.01 increase respectively in the contribution of manufacturing sector to gross domestic product. The probabilities of 0.11 and 0.49 for previous and current values, show that the short-run estimate is statistically non-significant. Theshort-run result agrees with the *a priori* expectation,and also in line with the findings of Garba (2014).

Besides, a unit increase in the ratio of gross capital formation to gross domestic product will stimulate 0.98 unit decrease in the contribution of manufacturing sector to the economy in the long-run and a unit increase in the previous and current values of the ratio of gross capital formation to gross domestic product will stimulate 0.32 unit increase and 0.15 unit decrease in the contribution of manufacturing sector to GDP respectively. With a probability of 0.014, the long-run effect of gross capital formation is statistically significant. The probability of 0.015 and 0.078 for the previous and current values respectively, reveal that the short-run previous value positive effect is statistically significant while the current value negative effect is statistically non-significant. The implication of the finding is that domestic investment prevailing in the Nigerian economy is detrimental and not sufficient to stimulate the manufacturing sector productivity.

Furthermore, the result also reveals that exchange rate has statistically insignificant negative effect on the contribution of manufacturing sector to gross domestic product in the short-run and long-run.A unit increase in exchange rate will cause 0.00006 unit decrease in the contribution of manufacturing sector to gross domestic product in the long-run, while a unit increase in the previous and current values of exchange rate, will cause 0.0005 and 0.0002 units decrease in the contribution of manufacturing sector to gross domestic product respectively. The probability of 0.33 reveals that the estimate of the long-run negative effect is statistically non-significant, However, the probabilities of 0.001 and 0.04 for previous and current values respectively, reveal that the estimate of the short-run effect of the previous value is statistically

significant at 1% level, while the current value effect is significant at 5% level. This result implies that devaluation will not promote manufacturing sector contribution to GDP. The result corroborates the finding of Okoye, et al. (2016).

Also, a unit increase in the ratio of foreign direct investment to gross domestic product will cause 0.016 unit decrease in the contribution of manufacturing sector to gross domestic product in the long-run, while in the short-run, a unit increase in the ratio of foreign direct investment to GDP will cause 0.005 unit decrease in the contribution of manufacturing sector to GDP. The probabilities of 0.001 and 0.003 for long-run and short-run estimate reveal that the negative effect of foreign direct investment is statistically significant at 1% level. Thus, indirect and significant relationship exists between foreign direct investment and contribution of manufacturing sector to gross domestic product. This is not in consonance with the *a priori* expectation. It is expected that foreign direct investment inflows should positively affect the performance of manufacturing sector in any country. The result is in line with the finding of Okoye, et al. (2016).

In addition, the result shows a direct effect of inflation rate on manufacturing sector contribution to economic growth in the short-run and long-run. A unit increase in inflation rate will increase manufacturing sector contribution to GDP by 0.0012 and 0.0007 units in the long-run and short-run respectively. The probabilities of 0.0005 and 0.0025 for long-run and short-run respectively, reveal that both estimates are statistically significant at 1% level. The implication of the finding is that an increase in inflation rate is needed to promote manufacturing sector performance in both the short-run and long-run. The direct effect negate the *a priori*, but corroborates the finding of Imoughele and Ismaila (2014), that positive relationship exist between inflation rate and manufacturing sector performance.

Also, the result indicates that government expenditure has a positive effect on manufacturing sector contribution to gross domestic product both in the long-run and short-run

current year. A unit increase in government expenditure will cause 0.0025 units increase in manufacturing sector contribution to GDP in the long run. A unit increase in the present and previous values of government expenditure, will lead to 0.0002 units increase and 0.0004 units decrease in the current value of manufacturing sector contribution to GDP respectively. The probability values of 0.003, 0.027 and 0.0011 for long-run, current and previous values respectively, indicate that the direct effect is statistically significant at 1% level for long-run and short-run previous value estimates, while at 5% for short-run current value estimate. This finding indicates that government capital and recurrent expenditures overtime affected manufacturing sector positively in the short-run current year and in the long-run.

In the long-run, interest rate produced a direct effect on manufacturing sector contribution to gross domestic product. A unit increase in interest rate will lead to 0.0005 unit increase in the manufacturing sector contribution to GDP in the long-run. The t statistic of 0.73 and the probability value of 0.49 reveal that the direct effect is not significant. Also, a positive relationship is maintained in the short-run. A unit increase in the current and previous values of interest rate will lead to 0.0008 and 0.0007 units increase in the current value of manufacturing sector contribution to GDPrespectively. The t statistic values of 2.76 and 2.38 with the probability values of 0.028 and 0.049 for short-run current and previous values estimation respectively indicate that the direct effect is statistically significant at 5% level. The implication of this finding is that, an increase in the cost of funds will not affect the manufacturing sector contribution to GDP either in the short-run or long-run. This finding negates the *a priori* expectation.It shows that manufacturers are concern about the availability and not the cost of funds.

Besides, the intercept term (c) shows the mean or average effect of all the variables excluded from the model. Thus, on the average, a unit increase in the value of the excluded variables will lead to 0.124 units increase in index of manufacturing sector production. In other

words, given that all the included explanatory variables are held constant, the index of manufacturing sector production would be 0.124 units. However, with a probability of 0.0007, the direct effect is statistically significant at 1% level. The implication of this finding is that apart from financial deepening and the controlled variables included, there are other significant explanatory variables causing variation in the index of manufacturing sector production in Nigeria.

It is also important to examine the statistical properties of the estimated result. From table 4.12, the R-squared value of 0.991 indicates that about 99.1% variation in the contribution ofmanufacturing sector to GDP is explained by the financial deepening and the controlled variables. The F-statistics of 33.50 with a probability of approximately 0,is statistically significant and this shows that there is a considerable harmony between manufacturing sector performance and the explanatory variables in the model. This confirms that financial deepening and the controlled variables jointly have significant influence on the contribution of the manufacturing sector to GDP.

The Breusch-Pagan-Godfrey (BPG) test is applied to investigate the presence of heteroscedasticity in the regression model. The BPG tests the null hypothesis of no heteroscedasticity (ie. homoscedasticity) against the alternative hypothesis of heteroscedasticity. The result in table 4.12 presents three different types of tests for heteroscedasticity; the "f" test, chi-square (X^2) test and the scaled explained sum of square (SESS) test.

The "F" test statistic is 0.790 and chi-square (X^2) test statistic is 21.386, with probability values of 0.69 and 0.50 respectively. Both test statistics give the same conclusion that there is no evidence for the presence of heteroscedasticity, since the probability values are considerably in excess of 0.05.

The "scaled explained sum of square" (SESS), which is the third test is based on a normalized version of the explained sum of squares from the auxiliary regression. The SESS

statistics of 1.453, with a probability value of 1.000, which is greater than 0.05, suggests the absence of heteroscedasticity.Therefore, the "f" test, chi-square (X^2) test and the "scalled explained sum of square (SESS) test, produced the same result that the model is homoscedastic.

The B-G Serial Correlation Lagranger Multiplier (LM) test is used to test for higher order Autoregressive Moving Average (ARMA) errors and is applicable whether or not there is lagged dependent variable(s). The B-G tests the null hypothesis of no serial correlation against the alternative hypothesis of serial correlation. Table 4.12 presents "F" statistic and chi-square (X^2) statistic for BG serial correlation LM test.

The B-G serial correlation statistic is 1.830 and the observed "R" squared statistic is 12.739. Also, the B-G Serial Correlation LM probability of "F" statistic is 0.229and the probability of chi-square is 0.82. Since the probabilities are greater than 5%, hence the null hypothesis of no auto-correlation cannot be rejected, implying that the model has no serial correlation. Also, the Durbin-Watson statistic of 2.094 indicates that there is no serial correlation associated with the regression model as this is in line with "two" as a benchmark. Therefore, this finding is in agreement with the result of Breusch-Pagan-Godfrey test.

In the model, the error correction term; $CointEq_{t-1}$ is well specified and correctly signed. The coefficient of the lag of co-integrating equation ($CointEq_{t-1}$) is approximately -0.53999. It means that about 54.00 percent departure from long run equilibrium is corrected in the short run. The negative sign in the lag of co-integrating equation confirms the existence of long-run relationship. Hence, about 54% of the variations in the short run converge. The probability of 0.003, shows that the estimate is statistically significant at 1% level.

The Ramsey RESET test is used to examine whether the relationship between the dependent variable and the explanatory variables is linear or not. The results of this test as shown in table 4.12, is for one fitted term. Both "F" and "t"statistics versions of the test are presented.

From the result, the “t” statistic is 1.3310 and theF statistic is 1.7716. The probability of 0.23 for both “t” and “F” statistics; which is greater than 0.05, reveals that the estimates are not significant at 5% level. Hence, there is no apparent non-linearity in the regression equation and it is hereby concluded that the linear model specified for the relationship is appropriate.

Furthermore, the Jarque-Bera (JB) statistic for the normality distribution of the model is 1.3645, with a probability of 0.51%. Since the probability of obtaining the JB statistic under the normality assumption is greater than 0.05, the null hypothesis that the error terms are normally distributed cannot be rejected at 5% level.

Finally, based on the results of adequacy tests and the statistical characteristics of the model, it is hereby concluded that the inferences we made about the coefficients estimate are appropriate and valid, and that the model specified is fit for forecasting purposes

4.5.4 **Objective four: To investigate the causal link between broad money supply, private sector credit, market capitalization and average capacity utilization of manufacturing sector in Nigeria**.

To achieve this objective, Toda-Yamamoto causality framework was applied and the result obtained is presented in table 4.13.

Table 4.13: Toda-Yamamoto Causality Test Results

H_o	*Chi-Square (X^2) Stat.*	*Df*	*P-Value*	*Decision*
FDMS → CTSA	6.01526	3	0.01574**	Causality
CTSA → FDMS	0.05178	3	0.68225	No causality
FDPC → CTSA	0.32863	3	0.25146	No causality
CTSA → FDPC	0.48113	3	0.16227	No causality
RCAP → CTSA	3.12841	3	0.08533	No causality
CTSA → RCAP	0.32274	3	0.22468	No causality
FDMS → FDPC, RCAP	4.92381	3	0.04386*	Causality
FDMS, FDPC → CTSA	1.20348	3	0.34228	No causality
FDMS, RCAP → CTSA	7.02312	3	0.01260**	Causality
FDPC, RCAP → CTSA	3.44301	3	0.05861	No causality
FDMS, FDPC, RCAP, → CTSA	9.86620	3	0.00364**	Causality

*Note: * and ** denotes rejection of the null hypothesis of non-causality at 5% and 1% respectively*.
Source:E-view 12.1 version output data

Table 4.13 presents the results from the modified Wald test for the bivariate and multivariate causality tests, and it reports the Chi-square (X^2) test statistic obtained, together with 3 degrees of freedom in accordance with the appropriate lag length along with the probability estimates.

The result in table 4.13 reveals that the chi-square (X^2) statistic of 6.02 with the associated probability of 0.02, confirm the existence of causality from broad money supply (FDMS) to average capacity utilization of manufacturing sector. Hence, the null hypothesis of no causality from broad money supply to average capacity utilization cannot be accepted. However, with chi-square statistic of 0.05 and a probability of 0.68, the null hypothesis of no causality from average capacity utilization to broad money supply cannot be rejected. Therefore, a unidirectional causality from broad money supply to average capacity utilization is established.

Also, the Chi-square statistic (X^2) of 4.92 and a probability of 0.04, indicate the rejection of the null-hypothesis of no causality from broad money supply (FDMS) to private sector credit and market capitalization. However, with Chi-square statistic (X^2) of 1.20 and a probability of 0.34, the null hypothesis of no causality from private sector credit and market capitalization to

average capacity utilization cannot be rejected. Hence, a unidirectional causality from broad money supply to private sector credit and market capitalization is established.

Furthermore, the null hypothesis of no causality from broad money supply and market capitalization to average capacity utilization of manufacturing sector cannot be accepted given the chi-square statistic of 7.02 and a probability of 0.01. The chi-square statistic and probability of 3.4 and 0.06, respectively, suggest acceptance of the null hypothesis of no causality from broad money supply and private sector credit to average capacity utilization of manufacturing sector.Finally, with chi-square statistic (X^2) of 9.87 and probability of 0.004, the null hypothesis that broad money supply, private sector credit and market capitalization do not cause average capacity utilization cannot be accepted. Therefore, the finding provides evidence for a significant unidirectional causality from financial deepening to average capacity utilization of manufacturing sector in Nigeria. This finding is in line with the finding of Okoye, et al. (2016) that financial development leads to increase causal impact of financial deepening on industrial output. However, it contradicts the findings of Ewetan and Ike (2014) that suggests a unidirectional causal link running from industrialization to financial development.

4.6 Discussions and Implications of findings

While some of the findings are in agreement with theoretical expectations, others are in contradictions. The implication which emerges from the empirical results with regards to the wrong signs of some of the parameters is that theoretical expectations would only be valid when all conditions are normal. Such outcome with wrong sign has important policy implications as market realities resulting from factors such as market inefficiencies, policy conflicts, information asymmetry and government interference in the interaction of market forces may produce results in direct contradiction to theoretical expectations. However, the first of the “ten commandments of

Applied Econometrics" given by Peter Kennedy of Simon Fraser University in Canada, is that "thou shalt use common sense and economic theory" (Gujarati, 2006).

Various results have emanated from this study and it is worth noting that the results have varying policy implications. Thus, if both X_2 and X_3 are statistically significant, it means they both have incremental explanatory power. If X_2 is statistically significant and X_3 is not, then the latter has non explanatory power and the former is preferred (Brooks, 2008). Based on the foregoing, decision is made on the hypotheses formulated with the use of Tables 4.14 to 4.16as follows:

1. **Objective one**

Table 4.14: The effect of financial deepening on the average capacity utilization of manufacturing sector.

Manufacturing sector performance	**period**	**Broad Money Supply (FDMS)**	**Credit to the private sector (FDPC)**	**Market capitalization of manufacturing firm (RCAP)**	**Periodic decision**	**Overall decision**
Average capacity utilization of manufacturing sector (CTSA)	Short-run Long-run	Sig. (+) Sig. (+)	Sig. (-) Non-Sig.(-)	Sig. (+) Sig. (-)	Sig. (+) Non-Sig. (-)	Positive and Significant

Source: Author's computation using result in Table 4.7

From table 4.14, the result reveals that financial deepening has direct and significant effect on the average capacity utilization of manufacturing sector in the short-run. However, the indirect effect in the long-run is statistically non-significant. Hence, financial deepening has a significantly positive effect on the average capacity utilization of manufacturing sector in Nigeria. Therefore, the null hypothesis that financial deepening has no significant positive effect on the average capacity utilization of the manufacturing sector cannot be accepted.

The implication of this is that financial deepening has short-term effect on the average capacity utilization of manufacturing sector and hence, financial deepening strategiescould only stimulate and enhancecapacity utilization of manufacturing firms in the short-run.

However, the ratio of private sector credit to gross domestic product has been detrimental in promoting the capacity utilization of manufacturing firms, both in the short-run and long-run.This implies that the credit made available to manufacturing firms have not yielded any significant positive effect on the capacity utilization of manufacturing firms in Nigeria. The more the loans are made available to the sector, the less the performance of the sector. This could be due to diversion of credit facilities to unproductive but high return investment opportunities.

The above behaviour of credit to private sector is a likely clue to one of the major causes of non-performance in the manufacturing sector in the country. It is expected that when credit are made available to manufacturing firms, outputs should be positively affected. This however calls for the attention of the government, regulatory authorities and all stakeholders in the manufacturing sector to address the menace of funds diversion leading to this discovery.

2. **Objective two**

Table 4.15: the effect of financial deepening on the Index of manufacturing sector production

Manufacturing sector performance	**Period**	**Broad Money Supply (FDMS)**	**Credit to the private sector (FDPC)**	**Market capitalization of manufacturing firm (RCAP)**	**Periodic decision**	**Overall decision**
Index of manufacturing sector production (MFGI)	Short-run Long-run	Non-Sig. (-) Sig. (-)	Non-Sig. (+) Non-Sig.(-)	Sig. (-) Sig. (-)	Sig. (-) Sig. (-)	Negative and Significant

Source: Author's computation using result in Table 4.9

From table 4.15, the result indicates a significant negative effect of financial deepening on the index of manufacturing sector production both in the short-run and long-run. Hence, the null hypothesis that financial deepening has no significant positive effect on the index of manufacturing sector production cannot be rejected. Therefore, the study hereby makes a submission that financial deepening has no significant positive effect on the index of manufacturing sector production in Nigeria. This implies that instead of promoting manufacturing index of production, financial deepening strategies adopted have retarded the performance index.

The plausible reason for the finding is market capitalization (financial deepening in the capital market)that is significantly detrimental in enhancing the index of manufacturing sector production in the short-run and long-run. One of the major reasons for the establishment of capital market in Nigeria is to provide avenue for long-term capital for development. The significant indirect short-run and long run effect recorded in this study could be due to the shock experienced in the Nigerian capital market caused by the assets price crash in 1998 to 2000, the global economic meltdown in 2007 and the financial crises that caused recession in the Nigerian capital market from 2016 to 2017. It could also be due to financial deepening policies misalignment in Nigeria. This finding is a deterrent for Nigeria, a developing country that requires long term funds to provide a big push for manufacturing sector performance.

Also, with a significant long run negative effect of broad money supply, the finding suggests that the larger percentage of money supplied is applied for consumption through importation. This portends a dangerous signal for manufacturing sector survival in Nigeria.

3.**Objective three**

Table 4.16: The effect of financial deepening on the contributions of manufacturing sector to GDP

Manufacturing sector performance	Period	Broad Money Supply (FDMS)	Credit to the private sector (FDPC)	Market capitalization of manufacturing firm (RCAP)	Periodic decision	Overall decision
Contribution of manufacturing sector to GDP (RMSP)	Short-run Long-run	Non-Sig. (+) Non-Sig. (+)	Non-Sig. (+) Sig.(-)	Non-Sig. (+) Non-Sig. (-)	Non-Sig. (+) Sig. (-)	Negative and Significant

Source: Author's computation using result in Table 4.11

The result in table 4.16 suggests that financial deepening has a non-significant positive effect on the contributions of manufacturing sector to GDP in the short-run. However, the long-run effect is significantly negative. Hence, the study hereby makes a submission that financial deepening has a significant negative effect on the contribution of the manufacturing sector in Nigeria. Therefore, the null hypothesis that financial deepening has no significant positive effect on the contributions of manufacturing sector to GDP cannot be rejected.

The major factor for this discovering is the significant detrimental effect of credit to the private sector (bank-based financial deepening) in the long-run. This suggests that due to the risk involved in long term lending by banks and the low capitalization of manufacturing firms, loans to the manufacturing sector are mostly made accessible on short-term basis and that most of the loans made available to the manufacturing firms are not channeled towards production.

4.**Objective four**

The Toda-Yamamoto causality result in table 4.13 provides evidence for a significant unidirectional causality from financial deepening (broad money supply, private sector credit and market capitalization) to manufacturing sector capacity utilization in Nigeria. Therefore, the null hypothesis of no significant causal relationship between broad money supply, private sector credit,

market capitalization and the manufacturing sector capacity utilization in Nigeria cannot be accepted. Hence, the results suggest that financial deepening causes average capacity utilization of manufacturing sector in Nigeria. This finding isin line with expectation because an appropriately deepened financial system is expected to promote capacity utilization of the manufacturing sector.

On a general note, the several financial deepening strategies adopted have not actually transformed the Nigerian manufacturing sector as result showed contrasting effect on manufacturing firms' performance. While money supply showed a positive effect, credit to private sector and market capitalization showed negative effect on the manufacturing firms'performance. These results suggest that financial deepening strategies adopted by government are misaligned and mal-adapted and hence counter- productive for enhancing manufacturing sector's performance in Nigeria.

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.1 Summary of findings

This dissertation made the following findings stated according to the objectives.

1. Financial deepening has a significantly positive effect on the average capacity utilization of manufacturing sector in Nigeria.
2. A negative and significant effect of financial deepening on the index of manufacturing production in Nigeria is discovered.
3. Financial deepening produced a significantly negative effect on the contributions of manufacturing sector to gross domestic product in Nigeria.
4. A unidirectional causality from financial deepening to average capacity utilization of manufacturing sector in Nigeria is established.

5.2 Conclusion

Based on the foregoingfindings,it is hereby concluded that financial deepeninghas not been able to perform the expected roles of promoting manufacturing sector performance in Nigeria due to its misalignment and mal-adaptation.Thus, the Nigerian financial system's institutional structure, culture, orientation and the modes of operation of its main actors are mainly transplanted typed and not appropriately adapted and oriented to suit Nigerian economic peculiarities, as well as not being made relevant to the developmental need of the manufacturing sector in the country.

This explains why the banks, capital market and other financial institution perform their intermediation roles in an ineffective way as to render them unable or unwilling to make the

expected contributions to manufacturing sector productivity in Nigeria. The limited savings mobilized are inefficiently allocated, mainly on short-term bases and usually to less productive activities. Therefore, measures taken by the Central Bank and other regulatory authorities to make the banks and other financial institutions change their non-productive financial practices, are usually not successful.

5.4 Recommendations

1. The regulatory authorities and banks should set up necessary machineries to monitor credit allocation to the manufacturing sector and ensure that credit to manufacturing firms are used for projected productive purposes and not diverted to other sectors of the economy or channeled to other unproductive activities.

2. Government should increase the money supply looking at the significance and indirect effect of this instrument.Capital expenditure should be consistently increased above the recurrent expenditure. As against the present practice, capital and recurrent expenditure should be in the ratio 7:3 respectively. As such, more funds would be injected in financing capital projects such as power and road infrastructures to promote manufacturing sector performance.

The extant capital market reforms and deepening strategies in Nigeria need to be carefully reviewed and closely monitored. The Nigerian Stock Exchange (NSE) should create a new tier-security market where the stringent conditions required for listing in the available tiers market would be relaxed to attract more manufacturing firms for public listings. In the new market, 10% (as against 25%, and 15% obtainable in the first-tier and second-tier security markets respectively) of the equity share capital should be made available to the public. Also, the number of shareholders must not be less than 30 as against 300 and 100 in the first and second tiers security markets respectively. If the various processes of listing on the stock exchange are made simpler,

less cumbersome and affordable, more manufacturing firms will be encouraged to be listed and the total market capitalization and the performance of the manufacturing sector will increase.

3. The findings suggest that the current monetary policy strategyof interest rate ceiling (especially without taking into account inflation rate) create a repressed level of private savings with dis-incentive for banks to lend to the manufacturing sector. Thus, there is the need for government to promote a more laissez faire financial policy, especially the removal of cap on deposite rate to allow it reflects the true scarcity of investible funds in Nigeria.

4. Government should rework and re-align the various financial deepening strategies to be properly adapted to the Nigerian financial peculiarities. Therefore, government should establish a manufacturing firms' tax-favoured investment scheme, and increase money supply to finance capital expenditure, to promote investement inthe private sector,while curtailing inflation with productivity in the manufacturing sector.

5.5 Contributions to Knowledge

1. This study has expanded the existing literature and empirical review which will enable researchers and scholar to use it for further studies.

2. This study has also contributed to knowledge by modifying the "supply leading" theory postulated by Levine and Zervos (1998) with King and Levine (1993) model, to produce a new model used for this study.

3. The use of updated data and three indicators; index of manufacturing sector production, contribution of manufacturing sector to GDP and average capacity utilization,as proxies for manufacturing sector performance has greatly contributed to the existing literature on manufacturing sector in Nigeria.

4. The use of broad money supply, credit to the private sector and market capitalization as indicators of money-based, bank-based and capital market-based financial deepening respectively has contributed to the extant literature on financial deepening.

5. The empirical literature has been enriched with the discovering that financial deepening strategies adopted has no significant contribution to the manufacturing sector performance in Nigeria, due to its miss-alignment and mal-adaptation.

6. The use of Toda-Yamamoto procedure to unravel the unidirectional causality from private sector credit, market capitalization and broad money supply to the average capacity utilization of manufacturing sector in Nigeria is a significant addition to the existing literature.

5.6 Suggestion for further study

Conceptually, financial system is divided into two sectors; the regulated and the unregulated sectors. The key variables of intermediation ratio applied for financial deepening in this study; ratio of private sector credit to GDP and ratio of market capitalization to GDP are mostly applicable to the formal and regulated financial sector.

However, the unregulated informal financial sector is large and still plays an important financialrole in Nigeria. Ojo (2010) emphasized that the unregulated financial sector in most cases is a more effective, efficient and equitable mobilizer and allocator of funds than the regulated financial sector. Also, According to Frances, Chukwuedo and Chukwunonso (2016), the unorganized money market contributes 57.91% to the Gross Domestic product in Nigeria. Therefore, there is the need for further study to examinefinancial deepening in the unregulated sector.

This study is an aggregate analysis. A further study is needed to investigate the combined effect of the three financial deepening indicators on individual manufacturing firms.

Three variables were utilized as manufacturing sector's performance indicators. However, this study examined causality relationship between the three financial deepening indicators utilized and the average capacity utilization of manufacturing sector, using Toda-Yamamoto Causaliy procedure. Hence, due to the inherent advantages of the procedure over the pairwise Granger Causality technique, there is the need for it to be used to examine the relationship between the financial deepening indicators applied and the other two indicators of manufacturing sector performance.

Finally, findings from this study suggest that financial deepening strategies are mal-adaptedly transplanted with interest rate ceiling, leading to excessive risk and vulnerabilities within the financial system in Nigeria. Therefore, there is the need for a study to examine the effect of financial repression on savings, investment and manufacturing sector performance in Nigeria.

Based on the foregoing, the following topics are suggested to be studied.

1. Informal financial deepening strategies and manufacturing sector performance in Nigeria.

2. Bank specific, capital market specific and monetary deepening strategies on manufacturing sector performance in Nigeria: A panel study.

3. The bivariate and multivariate causality relationship between bank specific, capital market specific, money supply; financial deepening strategies and index of manufacturing sector production in Nigeria.

4. The bivariate and multivariate causality relationship between bank specific, capital market specific, money supply; financial deepening strategies and the contributions of manufacturing sector to Gross Domestic Product in Nigeria.

5. The effects of repressed financial system on savings, investment and manufacturing sector performance in Nigeria.

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APPENDICES

Appendix 1: Input Data for the study

YEAR	MFGI	RMSP	FDPC	RCAP	RGCF	CTSA	INFR	EXCR	INTR	GEP	FDMS	RFDI
1986	78.2	0.090147	0.001001	0.000446	0.154438	38.8	5.4	2.020575	10.5	24.4044	11.7600	0.9324
1987	130.8	0.091595	0.001381	0.000537	0.117832	40.4	10.2	4.017942	17.5	35.7194	11.0542	2.5341
1988	135.2	0.099798	0.001685	0.000617	0.115862	42.4	38.3	4.536733	16.5	26.0270	11.9742	1.6271
1989	154.3	0.096278	0.001758	0.00074	0.110804	43.8	40.9	7.391558	26.8	47.8942	10.9502	7.7761
1990	162.9	0.086541	0.001738	0.000844	0.137627	40.3	7.5	8.037808	25.5	46.8942	10.5782	1.9114
1991	178.1	0.095283	0.002154	0.001203	0.137864	42	13	9.909492	20.01	10.4802	12.6503	2.6006
1992	182.7	0.089632	0.002962	0.00159	0.130865	38.1	44.57	17.29843	29.8	39.3681	12.2128	3.0601
1993	145.5	0.085643	0.006379	0.002384	0.149452	37.2	57.14	22.05106	18.32	106.0714	13.1318	8.5209
1994	144.2	0.083623	0.007179	0.003318	0.133925	30.4	57.42	21.8861	21	-15.8636	13.0639	10.8325
1995	136.3	0.078243	0.008844	0.008863	0.097027	29.3	72.73	21.8861	20.18	54.6169	9.9852	3.7807
1996	138.7	0.075547	0.011266	0.013495	0.110122	32.5	29.29	21.8861	19.73	35.6354	9.1517	4.5543
1997	138.5	0.073882	0.014512	0.012938	0.1ss16494	30.4	10.67	21.8861	13.54	26.9096	10.0515	4.2974
1998	133.1	0.063245	0.01576	0.011758	0.107909	32.4	7.86	21.8861	18.29	13.7544	10.6373	3.2849
1999	137.7	0.064992	0.019206	0.013363	0.104208	34.6	6.62	92.69335	21.32	94.5522	11.8506	2.8015
2000	138.2	0.063562	0.02239	0.019938	0.115578	36.1	6.94	102.1052	17.98	-26.0253	12.7359	2.4579
2001	137.7	0.065954	0.030274	0.026219	0.084833	42.7	18.87	111.9433	18.29	45.2101	15.6049	2.6975
2002	146.3	0.062637	0.032133	0.026414	0.089079	54.9	12.88	120.9702	24.85	0.0178	13.2892	3.1701
2003	147.1	0.06049	0.034581	0.042867	0.122137	56.5	14.03	129.3565	20.71	20.4100	14.6819	2.9641
2004	145.7	0.061206	0.040595	0.060322	0.084043	55.7	15	133.5004	19.18	19.2421	12.3075	2.1333
2005	145.7	0.062735	0.049057	0.077387	0.070324	54.8	17.86	132.147	17.95	25.9120	11.8452	4.4388
2006	89.4	0.064365	0.057272	0.128037	0.105024	53.3	8.22	128.6516	17.26	5.5298	13.2505	3.3380
2007	89.2	0.065782	0.085738	0.307105	0.138699	53.38	5.42	125.8331	16.94	20.9043	15.5398	3.6257
2008	91.2	0.066917	0.150859	0.207834	0.128445	53.84	11.58	118.5669	15.14	31.0703	20.4511	3.9395
2009	92.4	0.06666	0.183476	0.141023	0.159759	58.92	12.54	148.9017	18.99	6.5788	21.2510	5.0477
2010	93.7	0.065528	0.185984	0.181611	0.16815	55.82	13.72	150.298	17.59	21.7190	20.2060	1.6328
2011	100.1	0.073311	0.185357	0.178667	0.146507	56.3	10.8	153.8616	16.02	6.0038	19.3274	2.1472
2012	106.6	0.079821	0.24444	0.246971	0.144181	61.3	12.2	157.4994	16.79	-0.7844	19.3761	1.5338
2013	109.8	0.092162	0.249164	0.301768	0.14743	62.8	8.5	157.3112	16.72	2.9402	18.9285	1.0802
2014	107.5	0.099537	0.255085	0.251294	0.157428	64.2	8	158.5526	16.54	-2.6202	19.8546	0.8189
2015	107.8	0.095425	0.270565	0.246341	0.151139	68.4	9.6	193.2792	16.85	10.4576	20.0768	0.6503
2016	108.5	0.092774	0.310354	0.238266	0.18322	72.2	15.7	253.4923	16.86	10.9757	21.2906	0.1121
2017	112.3	0.098637	0.342895	0.279682	0.192448	55.0	16.5	305.5112	20.01	10.48015	21.8751	0.07806

Sources: Central Bank of Nigeria Bulletins; National Bureau of Statistics andWorld Economic Indicators.

Appendix 2: Descriptive Statistics

	CTSA	EXCR	INFR	FDMS	GEP	INTR
Mean	47.77375	95.59903	19.37375	14.71700	23.57767	18.86438
Median	48.55000	115.2551	12.71000	13.09785	20.65715	18.13500
Maximum	72.20000	305.5112	72.73000	21.87510	106.0714	29.80000
Minimum	29.30000	2.020575	5.400000	9.151700	-26.02530	10.50000
Std. Dev.	12.15063	79.04839	17.32316	4.081379	27.26267	3.776921
Skewness	0.127056	0.556082	1.718557	0.517036	1.181045	0.889019
Kurtosis	1.885554	2.847539	4.896312	1.721932	5.050149	4.529777
Jarque-Bera	1.742084	1.680203	20.54634	3.603685	13.04343	7.335517
Probability	0.418515	0.431667	0.000035	0.164995	0.001471	0.025534
Sum	1528.760	3059.169	619.9600	470.9440	754.4855	603.6600
Sum Sq. Dev.	4576.771	193708.1	9302.847	516.3872	23040.84	442.2190
Observations	32	32	32	32	32	32

Descriptive Statistics Continues

	MFGI	RFDI	FDPC	RCAP	RGCF	RMSP
Mean	127.0438	3.136874	0.088314	0.094808	0.128527	0.078499
Median	135.7500	2.749500	0.031204	0.026317	0.129655	0.076895
Maximum	182.7000	10.83250	0.342895	0.307105	0.192448	0.099798
Minimum	78.20000	0.078060	0.001001	0.000446	0.070324	0.060490
Std. Dev.	26.78783	2.348648	0.109143	0.110126	0.028953	0.013833
Skewness	0.023364	1.535680	1.017303	0.734161	0.111158	0.164115
Kurtosis	2.246907	5.619486	2.520608	1.902476	2.585509	1.445681
Jarque-Bera	0.759110	21.72661	5.825923	4.480702	0.294970	3.364857
Probability	0.684166	0.000019	0.054315	0.106421	0.862875	0.185922
Sum	4065.400	100.3800	2.826044	3.033842	4.112853	2.511952
Sum Sq. Dev.	22245.22	171.0005	0.369277	0.375962	0.025986	0.005932
Observations	32	32	32	32	32	32

Appendix 3: Unit Root test Results

Appendix 3A: ADF Unit Root Results

Null Hypothesis: CTSA has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic based on SIC, MAXLAG=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.124376	0.6933
Test critical values:	1% level	-3.661661	
	5% level	-2.960411	
	10% level	-2.619160	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(CTSA)
Method: Least Squares
Date: 01/13/19 Time: 03:42
Sample (adjusted): 1987 2017
Included observations: 31 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CTSA(-1)	-0.080179	0.071310	-1.124376	0.2701
C	4.334361	3.497842	1.239153	0.2252

R-squared	0.041773	Mean dependent var	0.522581
Adjusted R-squared	0.008730	S.D. dependent var	4.816842
S.E. of regression	4.795769	Akaike info criterion	6.035686
Sum squared resid	666.9827	Schwarz criterion	6.128201
Log likelihood	-91.55314	F-statistic	1.264221
Durbin-Watson stat	1.396778	Prob(F-statistic)	0.270075

Null Hypothesis: D(CTSA) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic based on SIC, MAXLAG=7)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-3.395503	0.0192

Test critical values:	1% level	-3.670170
	5% level	-2.963972
	10% level	-2.621007

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(CTSA,2)
Method: Least Squares
Date: 01/13/19 Time: 03:44
Sample (adjusted): 1988 2017
Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(CTSA(-1))	-0.873855	0.257356	-3.395503	0.0021
C	0.346225	0.949880	0.364493	0.7182

R-squared	0.291667	Mean dependent var	-0.626667
Adjusted R-squared	0.266370	S.D. dependent var	5.791293
S.E. of regression	4.960371	Akaike info criterion	6.105179
Sum squared resid	688.9479	Schwarz criterion	6.198592
Log likelihood	-89.57768	F-statistic	11.52944
Durbin-Watson stat	1.516602	Prob(F-statistic)	0.002066

Null Hypothesis: EXCR has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic based on SIC, MAXLAG=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		1.779038	0.9995
Test critical values:	1% level	-3.661661	
	5% level	-2.960411	
	10% level	-2.619160	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(EXCR)
Method: Least Squares
Date: 01/13/19 Time: 03:47
Sample (adjusted): 1987 2017
Included observations: 31 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
EXCR(-1)	0.085657	0.048148	1.779038	0.0857
C	2.181317	5.419955	0.402460	0.6903

R-squared	0.098398	Mean dependent var	9.790020
Adjusted R-squared	0.067309	S.D. dependent var	19.19406
S.E. of regression	18.53685	Akaike info criterion	8.739739
Sum squared resid	9964.824	Schwarz criterion	8.832254
Log likelihood	-133.4659	F-statistic	3.164976
Durbin-Watson stat	1.406194	Prob(F-statistic)	0.085718

Null Hypothesis: D(EXCR) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic based on SIC, MAXLAG=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.151292	0.0333
Test critical values:	1% level	-3.670170	
	5% level	-2.963972	
	10% level	-2.621007	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(EXCR,2)
Method: Least Squares
Date: 01/13/19 Time: 03:48
Sample (adjusted): 1988 2017
Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(EXCR(-1))	-0.606985	0.192615	-3.151292	0.0039
C	6.755373	3.741153	1.805693	0.0817

R-squared	0.261811	Mean dependent var	1.667384
Adjusted R-squared	0.235447	S.D. dependent var	21.14009
S.E. of regression	18.48463	Akaike info criterion	8.736096
Sum squared resid	9567.081	Schwarz criterion	8.829510
Log likelihood	-129.0414	F-statistic	9.930643
Durbin-Watson stat	1.981656	Prob(F-statistic)	0.003851

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(FDMS)
Method: Least Squares
Date: 01/13/19 Time: 03:52
Sample (adjusted): 1987 2017
Included observations: 31 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FDMS(-1)	-0.034986	0.075060	-0.466101	0.6446
C	0.833100	1.125401	0.740270	0.4651

R-squared	0.007436	Mean dependent var	0.326294
Adjusted R-squared	-0.026791	S.D. dependent var	1.594750
S.E. of regression	1.615971	Akaike info criterion	3.860090
Sum squared resid	75.72952	Schwarz criterion	3.952605
Log likelihood	-57.83140	F-statistic	0.217251
Durbin-Watson stat	1.764906	Prob(F-statistic)	0.644625

Null Hypothesis: D(FDMS) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic based on SIC, MAXLAG=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.889081	0.0004
Test critical values:	1% level	-3.670170	
	5% level	-2.963972	
	10% level	-2.621007	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(FDMS,2)
Method: Least Squares
Date: 01/13/19 Time: 03:53
Sample (adjusted): 1988 2017
Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(FDMS(-1))	-0.914248	0.186998	-4.889081	0.0000
C	0.333454	0.303943	1.097097	0.2819

R-squared	0.460533	Mean dependent var	0.043010
Adjusted R-squared	0.441267	S.D. dependent var	2.184196
S.E. of regression	1.632653	Akaike info criterion	3.882630
Sum squared resid	74.63558	Schwarz criterion	3.976044
Log likelihood	-56.23946	F-statistic	23.90311
Durbin-Watson stat	1.982268	Prob(F-statistic)	0.000038

Null Hypothesis: INFR has a unit root
Exogenous: Constant
Lag Length: 7 (Automatic based on SIC, MAXLAG=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.562543	0.0148
Test critical values:	1% level	-3.737853	
	5% level	-2.991878	
	10% level	-2.635542	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(INFR)
Method: Least Squares
Date: 01/14/19 Time: 21:57
Sample (adjusted): 1994 2017
Included observations: 24 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
INFR(-1)	-0.474534	0.133201	-3.562543	0.0028
D(INFR(-1))	-0.002379	0.171221	-0.013895	0.9891
D(INFR(-2))	0.316465	0.160269	1.974588	0.0670
D(INFR(-3))	0.221982	0.142044	1.562764	0.1390
D(INFR(-4))	-0.054336	0.124800	-0.435386	0.6695
D(INFR(-5))	-0.279999	0.120386	-2.325856	0.0345
D(INFR(-6))	0.226096	0.109870	2.057844	0.0574
D(INFR(-7))	0.187795	0.123396	1.521888	0.1488
C	6.666176	2.986388	2.232186	0.0413

R-squared	0.769679	Mean dependent var	-1.693333

Adjusted R-squared	0.646841	S.D. dependent var	11.04033
S.E. of regression	6.560954	Akaike info criterion	6.880146
Sum squared resid	645.6918	Schwarz criterion	7.321916
Log likelihood	-73.56175	F-statistic	6.265818
Durbin-Watson stat	1.982068	Prob(F-statistic)	0.001183

Null Hypothesis: GEP has a unit root
Exogenous: Constant
Lag Length: 6 (Automatic based on SIC, MAXLAG=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-0.277565	0.9152
Test critical values:	1% level	-3.724070	
	5% level	-2.986225	
	10% level	-2.632604	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(GEP)
Method: Least Squares
Date: 01/13/19 Time: 03:55
Sample (adjusted): 1993 2017
Included observations: 25 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GEP(-1)	-0.124542	0.448695	-0.277565	0.7847
D(GEP(-1))	-1.298311	0.500194	-2.595615	0.0189
D(GEP(-2))	-1.173326	0.574506	-2.042320	0.0569
D(GEP(-3))	-0.792838	0.635228	-1.248116	0.2289
D(GEP(-4))	-0.464481	0.600924	-0.772944	0.4502
D(GEP(-5))	-0.451418	0.459899	-0.981559	0.3401
D(GEP(-6))	-0.094036	0.252996	-0.371689	0.7147
C	-2.846336	13.18598	-0.215861	0.8317

R-squared	0.810817	Mean dependent var	-1.155518
Adjusted R-squared	0.732918	S.D. dependent var	48.13195
S.E. of regression	24.87457	Akaike info criterion	9.519906
Sum squared resid	10518.65	Schwarz criterion	9.909947
Log likelihood	-110.9988	F-statistic	10.40859
Durbin-Watson stat	1.452747	Prob(F-statistic)	0.000045

Null Hypothesis: D(GEP) has a unit root
Exogenous: Constant
Lag Length: 5 (Automatic based on SIC, MAXLAG=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.062119	0.0428
Test critical values:	1% level	-3.724070	
	5% level	-2.986225	
	10% level	-2.632604	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(GEP,2)
Method: Least Squares
Date: 01/13/19 Time: 03:56
Sample (adjusted): 1993 2017
Included observations: 25 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(GEP(-1))	-5.789922	1.890822	-3.062119	0.0067
D(GEP(-1),2)	3.370334	1.742065	1.934678	0.0689
D(GEP(-2),2)	2.085899	1.449078	1.439466	0.1672
D(GEP(-3),2)	1.188343	1.035742	1.147336	0.2663
D(GEP(-4),2)	0.633753	0.594343	1.066310	0.3004
D(GEP(-5),2)	0.120298	0.228543	0.526370	0.6051
C	-6.163392	5.427841	-1.135514	0.2711

R-squared	0.945317	Mean dependent var	-1.175338
Adjusted R-squared	0.927090	S.D. dependent var	89.72879
S.E. of regression	24.22845	Akaike info criterion	9.444428
Sum squared resid	10566.32	Schwarz criterion	9.785713
Log likelihood	-111.0553	F-statistic	51.86210
Durbin-Watson stat	1.448911	Prob(F-statistic)	0.000000

Null Hypothesis: INTR has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic based on SIC, MAXLAG=7)

		t-Statistic	Prob.*

Augmented Dickey-Fuller test statistic		-4.631820	0.0008
Test critical values:	1% level	-3.661661	
	5% level	-2.960411	
	10% level	-2.619160	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(INTR)
Method: Least Squares
Date: 01/13/19 Time: 03:58
Sample (adjusted): 1987 2017
Included observations: 31 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
INTR(-1)	-0.760566	0.164205	-4.631820	0.0001
C	14.62626	3.152954	4.638908	0.0001

R-squared	0.425216	Mean dependent var	0.306774
Adjusted R-squared	0.405396	S.D. dependent var	4.471195
S.E. of regression	3.447764	Akaike info criterion	5.375670
Sum squared resid	344.7251	Schwarz criterion	5.468185
Log likelihood	-81.32288	F-statistic	21.45375
Durbin-Watson stat	2.082970	Prob(F-statistic)	0.000071

Null Hypothesis: MFGI has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic based on SIC, MAXLAG=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.280138	0.1843
Test critical values:	1% level	-3.661661	
	5% level	-2.960411	
	10% level	-2.619160	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(MFGI)
Method: Least Squares
Date: 01/13/19 Time: 04:39
Sample (adjusted): 1987 2017

Included observations: 31 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
MFGI(-1)	-0.239537	0.105054	-2.280138	0.0301
C	31.64559	13.68585	2.312285	0.0281

R-squared	0.152023	Mean dependent var	1.100000
Adjusted R-squared	0.122782	S.D. dependent var	16.64464
S.E. of regression	15.58935	Akaike info criterion	8.393394
Sum squared resid	7047.811	Schwarz criterion	8.485910
Log likelihood	-128.0976	F-statistic	5.199027
Durbin-Watson stat	1.344575	Prob(F-statistic)	0.030136

Null Hypothesis: D(MFGI) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic based on SIC, MAXLAG=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.998021	0.0000
Test critical values:	1% level	-3.670170	
	5% level	-2.963972	
	10% level	-2.621007	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(MFGI,2)
Method: Least Squares
Date: 01/13/19 Time: 04:40
Sample (adjusted): 1988 2017
Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(MFGI(-1))	-0.924463	0.154128	-5.998021	0.0000
C	-0.692959	2.568962	-0.269743	0.7893

R-squared	0.562338	Mean dependent var	-1.626667
Adjusted R-squared	0.546707	S.D. dependent var	20.86075
S.E. of regression	14.04493	Akaike info criterion	8.186740
Sum squared resid	5523.281	Schwarz criterion	8.280154
Log likelihood	-120.8011	F-statistic	35.97625
Durbin-Watson stat	2.046032	Prob(F-statistic)	0.000002

Null Hypothesis: RFDI has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic based on SIC, MAXLAG=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.295890	0.0238
Test critical values:	1% level	-3.661661	
	5% level	-2.960411	
	10% level	-2.619160	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(RFDI)
Method: Least Squares
Date: 01/13/19 Time: 04:42
Sample (adjusted): 1987 2017
Included observations: 31 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RFDI(-1)	-0.559036	0.169616	-3.295890	0.0026
C	1.781228	0.671503	2.652597	0.0128

R-squared	0.272506	Mean dependent var	-0.027559
Adjusted R-squared	0.247420	S.D. dependent var	2.483507
S.E. of regression	2.154476	Akaike info criterion	4.435313
Sum squared resid	134.6112	Schwarz criterion	4.527828
Log likelihood	-66.74735	F-statistic	10.86289
Durbin-Watson stat	2.030911	Prob(F-statistic)	0.002594

Null Hypothesis: FDPC has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic based on SIC, MAXLAG=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		2.918922	1.0000
Test critical values:	1% level	-3.661661	
	5% level	-2.960411	
	10% level	-2.619160	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(FDPC)
Method: Least Squares
Date: 01/13/19 Time: 04:43
Sample (adjusted): 1987 2017
Included observations: 31 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FDPC(-1)	0.082595	0.028296	2.918922	0.0067
C	0.004413	0.003598	1.226405	0.2299

R-squared	0.227081	Mean dependent var	0.011029
Adjusted R-squared	0.200429	S.D. dependent var	0.017401
S.E. of regression	0.015560	Akaike info criterion	-5.425922
Sum squared resid	0.007021	Schwarz criterion	-5.333407
Log likelihood	86.10179	F-statistic	8.520108
Durbin-Watson stat	1.708312	Prob(F-statistic)	0.006725

Null Hypothesis: D(FDPC) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic based on SIC, MAXLAG=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.467470	0.0162
Test critical values:	1% level	-3.670170	
	5% level	-2.963972	
	10% level	-2.621007	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(FDPC,2)
Method: Least Squares
Date: 01/13/19 Time: 04:44
Sample (adjusted): 1988 2017
Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(FDPC(-1))	-0.621107	0.179124	-3.467470	0.0017
C	0.007477	0.003552	2.105037	0.0444

R-squared	0.300408	Mean dependent var	0.001072
Adjusted R-squared	0.275423	S.D. dependent var	0.019521
S.E. of regression	0.016617	Akaike info criterion	-5.292478
Sum squared resid	0.007731	Schwarz criterion	-5.199064
Log likelihood	81.38716	F-statistic	12.02335
Durbin-Watson stat	1.917846	Prob(F-statistic)	0.001715

Null Hypothesis: RCAP has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic based on SIC, MAXLAG=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-0.658500	0.8427
Test critical values:	1% level	-3.661661	
	5% level	-2.960411	
	10% level	-2.619160	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(RCAP)
Method: Least Squares
Date: 01/13/19 Time: 04:48
Sample (adjusted): 1987 2017
Included observations: 31 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RCAP(-1)	-0.051410	0.078071	-0.658500	0.5154
C	0.013575	0.010728	1.265367	0.2158

R-squared	0.014732	Mean dependent var	0.009008
Adjusted R-squared	-0.019243	S.D. dependent var	0.045136
S.E. of regression	0.045568	Akaike info criterion	-3.276862
Sum squared resid	0.060218	Schwarz criterion	-3.184346
Log likelihood	52.79135	F-statistic	0.433622
Durbin-Watson stat	2.065120	Prob(F-statistic)	0.515412

Null Hypothesis: D(RCAP) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic based on SIC, MAXLAG=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.690353	0.0001
Test critical values:	1% level	-3.670170	
	5% level	-2.963972	
	10% level	-2.621007	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(RCAP,2)
Method: Least Squares
Date: 01/13/19 Time: 04:50
Sample (adjusted): 1988 2017
Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(RCAP(-1))	-1.080833	0.189941	-5.690353	0.0000
C	0.009946	0.008629	1.152560	0.2588

R-squared	0.536271	Mean dependent var	0.001378
Adjusted R-squared	0.519709	S.D. dependent var	0.067153
S.E. of regression	0.046539	Akaike info criterion	-3.232721
Sum squared resid	0.060644	Schwarz criterion	-3.139308
Log likelihood	50.49082	F-statistic	32.38012
Durbin-Watson stat	2.039339	Prob(F-statistic)	0.000004

Null Hypothesis: RGCF has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic based on SIC, MAXLAG=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.625888	0.4578
Test critical values:	1% level	-3.661661	
	5% level	-2.960411	
	10% level	-2.619160	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(RGCF)
Method: Least Squares

Date: 01/13/19 Time: 04:51
Sample (adjusted): 1987 2017
Included observations: 31 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RGCF(-1)	-0.226739	0.139455	-1.625888	0.1148
C	0.029901	0.018019	1.659375	0.1078

R-squared	0.083540	Mean dependent var	0.001226
Adjusted R-squared	0.051938	S.D. dependent var	0.021131
S.E. of regression	0.020575	Akaike info criterion	-4.867107
Sum squared resid	0.012277	Schwarz criterion	-4.774592
Log likelihood	77.44016	F-statistic	2.643513
Durbin-Watson stat	1.790295	Prob(F-statistic)	0.114793

Null Hypothesis: D(RGCF) has a unit root
Exogenous: Constant
Lag Length: 1 (Automatic based on SIC, MAXLAG=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.799929	0.0000
Test critical values:	1% level	-3.679322	
	5% level	-2.967767	
	10% level	-2.622989	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(RGCF,2)
Method: Least Squares
Date: 01/13/19 Time: 04:52
Sample (adjusted): 1989 2017
Included observations: 29 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(RGCF(-1))	-1.557230	0.268491	-5.799929	0.0000
D(RGCF(-1),2)	0.384705	0.177304	2.169745	0.0394
C	0.002986	0.003650	0.818200	0.4207

R-squared	0.628495	Mean dependent var	0.000386
Adjusted R-squared	0.599918	S.D. dependent var	0.030880
S.E. of regression	0.019532	Akaike info criterion	-4.935800
Sum squared resid	0.009919	Schwarz criterion	-4.794356

Log likelihood	74.56910	F-statistic	21.99282
Durbin-Watson stat	1.813437	Prob(F-statistic)	0.000003

Null Hypothesis: RMSP has a unit root
Exogenous: Constant
Lag Length: 1 (Automatic based on SIC, MAXLAG=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-0.943154	0.7600
Test critical values:	1% level	-3.670170	
	5% level	-2.963972	
	10% level	-2.621007	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(RMSP)
Method: Least Squares
Date: 01/13/19 Time: 04:53
Sample (adjusted): 1988 2017
Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RMSP(-1)	-0.072429	0.076794	-0.943154	0.3540
D(RMSP(-1))	0.183594	0.195443	0.939374	0.3559
C	0.005827	0.006027	0.966867	0.3422

R-squared	0.051286	Mean dependent var	0.000235
Adjusted R-squared	-0.018989	S.D. dependent var	0.005439
S.E. of regression	0.005490	Akaike info criterion	-7.477045
Sum squared resid	0.000814	Schwarz criterion	-7.336925
Log likelihood	115.1557	F-statistic	0.729794
Durbin-Watson stat	1.912172	Prob(F-statistic)	0.491275

Null Hypothesis: D(RMSP) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic based on SIC, MAXLAG=7)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-4.491788	0.0013

Test critical values:	1% level	-3.670170
	5% level	-2.963972
	10% level	-2.621007

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(RMSP,2)
Method: Least Squares
Date: 01/13/19 Time: 04:54
Sample (adjusted): 1988 2017
Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(RMSP(-1))	-0.855856	0.190538	-4.491788	0.0001
C	0.000222	0.001001	0.221992	0.8259

R-squared	0.418800	Mean dependent var	0.000147
Adjusted R-squared	0.398042	S.D. dependent var	0.007062
S.E. of regression	0.005479	Akaike info criterion	-7.511297
Sum squared resid	0.000841	Schwarz criterion	-7.417884
Log likelihood	114.6694	F-statistic	20.17616
Durbin-Watson stat	1.912438	Prob(F-statistic)	0.000111

Appendix 3B: PP Unit Root Results

Null Hypothesis: CTSA has a unit root
Exogenous: Constant
Bandwidth: 2 (Newey-West using Bartlett kernel)

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-1.203369	0.6602
Test critical values:	1% level	-3.661661	
	5% level	-2.960411	
	10% level	-2.619160	

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

Residual variance (no correction)	21.51557
HAC corrected variance (Bartlett kernel)	24.98518

Phillips-Perron Test Equation
Dependent Variable: D(CTSA)
Method: Least Squares
Date: 01/13/19 Time: 04:01
Sample (adjusted): 1987 2017
Included observations: 31 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CTSA(-1)	-0.080179	0.071310	-1.124376	0.2701
C	4.334361	3.497842	1.239153	0.2252

R-squared	0.041773	Mean dependent var	0.522581
Adjusted R-squared	0.008730	S.D. dependent var	4.816842
S.E. of regression	4.795769	Akaike info criterion	6.035686
Sum squared resid	666.9827	Schwarz criterion	6.128201
Log likelihood	-91.55314	F-statistic	1.264221
Durbin-Watson stat	1.396778	Prob(F-statistic)	0.270075

Null Hypothesis: D(CTSA) has a unit root
Exogenous: Constant
Bandwidth: 0 (Newey-West using Bartlett kernel)

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-3.395503	0.0192
Test critical values:	1% level	-3.670170	
	5% level	-2.963972	
	10% level	-2.621007	

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

Residual variance (no correction)	22.96493
HAC corrected variance (Bartlett kernel)	22.96493

Phillips-Perron Test Equation
Dependent Variable: D(CTSA,2)
Method: Least Squares
Date: 01/13/19 Time: 04:03
Sample (adjusted): 1988 2017
Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.

D(CTSA(-1))	-0.873855	0.257356	-3.395503	0.0021
C	0.346225	0.949880	0.364493	0.7182

R-squared	0.291667	Mean dependent var	-0.626667
Adjusted R-squared	0.266370	S.D. dependent var	5.791293
S.E. of regression	4.960371	Akaike info criterion	6.105179
Sum squared resid	688.9479	Schwarz criterion	6.198592
Log likelihood	-89.57768	F-statistic	11.52944
Durbin-Watson stat	1.516602	Prob(F-statistic)	0.002066

Null Hypothesis: EXCR has a unit root
Exogenous: Constant
Bandwidth: 0 (Newey-West using Bartlett kernel)

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		1.779038	0.9995
Test critical values:	1% level	-3.661661	
	5% level	-2.960411	
	10% level	-2.619160	

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

Residual variance (no correction)	321.4459
HAC corrected variance (Bartlett kernel)	321.4459

Phillips-Perron Test Equation
Dependent Variable: D(EXCR)
Method: Least Squares
Date: 01/13/19 Time: 04:04
Sample (adjusted): 1987 2017
Included observations: 31 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
EXCR(-1)	0.085657	0.048148	1.779038	0.0857
C	2.181317	5.419955	0.402460	0.6903

R-squared	0.098398	Mean dependent var	9.790020
Adjusted R-squared	0.067309	S.D. dependent var	19.19406
S.E. of regression	18.53685	Akaike info criterion	8.739739
Sum squared resid	9964.824	Schwarz criterion	8.832254
Log likelihood	-133.4659	F-statistic	3.164976

Durbin-Watson stat	1.406194	Prob(F-statistic)	0.085718

Null Hypothesis: D(EXCR) has a unit root
Exogenous: Constant
Bandwidth: 0 (Newey-West using Bartlett kernel)

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-3.151292	0.0333
Test critical values:	1% level	-3.670170	
	5% level	-2.963972	
	10% level	-2.621007	

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

Residual variance (no correction)	318.9027
HAC corrected variance (Bartlett kernel)	318.9027

Phillips-Perron Test Equation
Dependent Variable: D(EXCR,2)
Method: Least Squares
Date: 01/13/19 Time: 04:08
Sample (adjusted): 1988 2017
Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(EXCR(-1))	-0.606985	0.192615	-3.151292	0.0039
C	6.755373	3.741153	1.805693	0.0817

R-squared	0.261811	Mean dependent var	1.667384
Adjusted R-squared	0.235447	S.D. dependent var	21.14009
S.E. of regression	18.48463	Akaike info criterion	8.736096
Sum squared resid	9567.081	Schwarz criterion	8.829510
Log likelihood	-129.0414	F-statistic	9.930643
Durbin-Watson stat	1.981656	Prob(F-statistic)	0.003851

Null Hypothesis: INFR has a unit root
Exogenous: Constant
Bandwidth: 1 (Newey-West using Bartlett kernel)

		Adj. t-Stat	Prob.*

Phillips-Perron test statistic		-2.620309	0.0998
Test critical values:	1% level	-3.661661	
	5% level	-2.960411	
	10% level	-2.619160	

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

Residual variance (no correction)	160.0151
HAC corrected variance (Bartlett kernel)	194.3920

Phillips-Perron Test Equation
Dependent Variable: D(INFR)
Method: Least Squares
Date: 01/13/19 Time: 04:09
Sample (adjusted): 1987 2017
Included observations: 31 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
INFR(-1)	-0.332527	0.135661	-2.451166	0.0205
C	6.831176	3.534365	1.932787	0.0631

R-squared	0.171623	Mean dependent var	0.358065
Adjusted R-squared	0.143058	S.D. dependent var	14.12820
S.E. of regression	13.07863	Akaike info criterion	8.042178
Sum squared resid	4960.468	Schwarz criterion	8.134693
Log likelihood	-122.6538	F-statistic	6.008217
Durbin-Watson stat	1.570186	Prob(F-statistic)	0.020504

Null Hypothesis: D(INFR) has a unit root
Exogenous: Constant
Bandwidth: 8 (Newey-West using Bartlett kernel)

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-5.049407	0.0003
Test critical values:	1% level	-3.670170	
	5% level	-2.963972	
	10% level	-2.621007	

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

Residual variance (no correction)	196.6869
HAC corrected variance (Bartlett kernel)	70.33217

Phillips-Perron Test Equation
Dependent Variable: D(INFR,2)
Method: Least Squares
Date: 01/13/19 Time: 04:10
Sample (adjusted): 1988 2017
Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(INFR(-1))	-0.894077	0.187598	-4.765908	0.0001
C	0.173633	2.651166	0.065493	0.9482

R-squared	0.447883	Mean dependent var	-0.133333
Adjusted R-squared	0.428164	S.D. dependent var	19.19702
S.E. of regression	14.51675	Akaike info criterion	8.252823
Sum squared resid	5900.606	Schwarz criterion	8.346236
Log likelihood	-121.7924	F-statistic	22.71388
Durbin-Watson stat	1.844047	Prob(F-statistic)	0.000053

Null Hypothesis: FDMS has a unit root
Exogenous: Constant
Bandwidth: 3 (Newey-West using Bartlett kernel)

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-0.558201	0.8659
Test critical values:	1% level	-3.661661	
	5% level	-2.960411	
	10% level	-2.619160	

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

Residual variance (no correction)	2.442888
HAC corrected variance (Bartlett kernel)	2.706547

Phillips-Perron Test Equation
Dependent Variable: D(FDMS)
Method: Least Squares
Date: 01/13/19 Time: 04:11

Sample (adjusted): 1987 2017
Included observations: 31 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FDMS(-1)	-0.034986	0.075060	-0.466101	0.6446
C	0.833100	1.125401	0.740270	0.4651

R-squared	0.007436	Mean dependent var	0.326294
Adjusted R-squared	-0.026791	S.D. dependent var	1.594750
S.E. of regression	1.615971	Akaike info criterion	3.860090
Sum squared resid	75.72952	Schwarz criterion	3.952605
Log likelihood	-57.83140	F-statistic	0.217251
Durbin-Watson stat	1.764906	Prob(F-statistic)	0.644625

Null Hypothesis: D(FDMS) has a unit root
Exogenous: Constant
Bandwidth: 5 (Newey-West using Bartlett kernel)

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-4.972826	0.0004
Test critical values:	1% level	-3.670170	
	5% level	-2.963972	
	10% level	-2.621007	

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

Residual variance (no correction)	2.487853
HAC corrected variance (Bartlett kernel)	1.301808

Phillips-Perron Test Equation
Dependent Variable: D(FDMS,2)
Method: Least Squares
Date: 01/13/19 Time: 04:11
Sample (adjusted): 1988 2017
Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(FDMS(-1))	-0.914248	0.186998	-4.889081	0.0000
C	0.333454	0.303943	1.097097	0.2819

R-squared	0.460533	Mean dependent var	0.043010

Adjusted R-squared	0.441267	S.D. dependent var	2.184196
S.E. of regression	1.632653	Akaike info criterion	3.882630
Sum squared resid	74.63558	Schwarz criterion	3.976044
Log likelihood	-56.23946	F-statistic	23.90311
Durbin-Watson stat	1.982268	Prob(F-statistic)	0.000038

Null Hypothesis: GEP has a unit root
Exogenous: Constant
Bandwidth: 4 (Newey-West using Bartlett kernel)

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-6.911447	0.0000
Test critical values:	1% level	-3.661661	
	5% level	-2.960411	
	10% level	-2.619160	

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

Residual variance (no correction)	687.3630
HAC corrected variance (Bartlett kernel)	1283.616

Phillips-Perron Test Equation
Dependent Variable: D(GEP)
Method: Least Squares
Date: 01/13/19 Time: 04:13
Sample (adjusted): 1987 2017
Included observations: 31 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GEP(-1)	-1.275223	0.179267	-7.113531	0.0000
C	30.15642	6.497170	4.641469	0.0001

R-squared	0.635689	Mean dependent var	-0.449169
Adjusted R-squared	0.623127	S.D. dependent var	44.15472
S.E. of regression	27.10659	Akaike info criterion	9.499772

Null Hypothesis: INTR has a unit root
Exogenous: Constant
Bandwidth: 4 (Newey-West using Bartlett kernel)

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-4.731632	0.0006
Test critical values:	1% level	-3.661661	
	5% level	-2.960411	
	10% level	-2.619160	

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

Residual variance (no correction)	11.12017
HAC corrected variance (Bartlett kernel)	15.12222

Phillips-Perron Test Equation
Dependent Variable: D(INTR)
Method: Least Squares
Date: 01/13/19 Time: 04:14
Sample (adjusted): 1987 2017
Included observations: 31 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
INTR(-1)	-0.760566	0.164205	-4.631820	0.0001
C	14.62626	3.152954	4.638908	0.0001

R-squared	0.425216	Mean dependent var	0.306774
Adjusted R-squared	0.405396	S.D. dependent var	4.471195
S.E. of regression	3.447764	Akaike info criterion	5.375670
Sum squared resid	344.7251	Schwarz criterion	5.468185
Log likelihood	-81.32288	F-statistic	21.45375
Durbin-Watson stat	2.082970	Prob(F-statistic)	0.000071

Null Hypothesis: MFGI has a unit root
Exogenous: Constant
Bandwidth: 3 (Newey-West using Bartlett kernel)

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-2.566180	0.1106
Test critical values:	1% level	-3.661661	
	5% level	-2.960411	
	10% level	-2.619160	

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

Residual variance (no correction)	227.3487
HAC corrected variance (Bartlett kernel)	372.1456

Phillips-Perron Test Equation
Dependent Variable: D(MFGI)
Method: Least Squares
Date: 01/13/19 Time: 04:55
Sample (adjusted): 1987 2017
Included observations: 31 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
MFGI(-1)	-0.239537	0.105054	-2.280138	0.0301
C	31.64559	13.68585	2.312285	0.0281

R-squared	0.152023	Mean dependent var	1.100000
Adjusted R-squared	0.122782	S.D. dependent var	16.64464
S.E. of regression	15.58935	Akaike info criterion	8.393394
Sum squared resid	7047.811	Schwarz criterion	8.485910
Log likelihood	-128.0976	F-statistic	5.199027
Durbin-Watson stat	1.344575	Prob(F-statistic)	0.030136

Null Hypothesis: D(MFGI) has a unit root
Exogenous: Constant
Bandwidth: 2 (Newey-West using Bartlett kernel)

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-6.025924	0.0000
Test critical values:	1% level	-3.670170	
	5% level	-2.963972	
	10% level	-2.621007	

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

Residual variance (no correction)	184.1094
HAC corrected variance (Bartlett kernel)	177.7355

Phillips-Perron Test Equation
Dependent Variable: D(MFGI,2)

Method: Least Squares
Date: 01/13/19 Time: 04:57
Sample (adjusted): 1988 2017
Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(MFGI(-1))	-0.924463	0.154128	-5.998021	0.0000
C	-0.692959	2.568962	-0.269743	0.7893

R-squared	0.562338	Mean dependent var	-1.626667
Adjusted R-squared	0.546707	S.D. dependent var	20.86075
S.E. of regression	14.04493	Akaike info criterion	8.186740
Sum squared resid	5523.281	Schwarz criterion	8.280154
Log likelihood	-120.8011	F-statistic	35.97625
Durbin-Watson stat	2.046032	Prob(F-statistic)	0.000002

Null Hypothesis: RFDI has a unit root
Exogenous: Constant
Bandwidth: 0 (Newey-West using Bartlett kernel)

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-3.295890	0.0238
Test critical values:	1% level	-3.661661	
	5% level	-2.960411	
	10% level	-2.619160	

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

Residual variance (no correction)	4.342297
HAC corrected variance (Bartlett kernel)	4.342297

Phillips-Perron Test Equation
Dependent Variable: D(RFDI)
Method: Least Squares
Date: 01/13/19 Time: 04:58
Sample (adjusted): 1987 2017
Included observations: 31 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RFDI(-1)	-0.559036	0.169616	-3.295890	0.0026

C	1.781228	0.671503	2.652597	0.0128

R-squared	0.272506	Mean dependent var	-0.027559
Adjusted R-squared	0.247420	S.D. dependent var	2.483507
S.E. of regression	2.154476	Akaike info criterion	4.435313
Sum squared resid	134.6112	Schwarz criterion	4.527828
Log likelihood	-66.74735	F-statistic	10.86289
Durbin-Watson stat	2.030911	Prob(F-statistic)	0.002594

Null Hypothesis: FDPC has a unit root
Exogenous: Constant
Bandwidth: 6 (Newey-West using Bartlett kernel)

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		3.107799	1.0000
Test critical values:	1% level	-3.661661	
	5% level	-2.960411	
	10% level	-2.619160	

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

Residual variance (no correction)	0.000226
HAC corrected variance (Bartlett kernel)	0.000205

Phillips-Perron Test Equation
Dependent Variable: D(FDPC)
Method: Least Squares
Date: 01/13/19 Time: 04:59
Sample (adjusted): 1987 2017
Included observations: 31 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FDPC(-1)	0.082595	0.028296	2.918922	0.0067
C	0.004413	0.003598	1.226405	0.2299

R-squared	0.227081	Mean dependent var	0.011029
Adjusted R-squared	0.200429	S.D. dependent var	0.017401
S.E. of regression	0.015560	Akaike info criterion	-5.425922
Sum squared resid	0.007021	Schwarz criterion	-5.333407
Log likelihood	86.10179	F-statistic	8.520108
Durbin-Watson stat	1.708312	Prob(F-statistic)	0.006725

Null Hypothesis: D(FDPC) has a unit root
Exogenous: Constant
Bandwidth: 4 (Newey-West using Bartlett kernel)

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-3.463798	0.0163
Test critical values:	1% level	-3.670170	
	5% level	-2.963972	
	10% level	-2.621007	

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

Residual variance (no correction)	0.000258
HAC corrected variance (Bartlett kernel)	0.000257

Phillips-Perron Test Equation
Dependent Variable: D(FDPC,2)
Method: Least Squares
Date: 01/13/19 Time: 05:01
Sample (adjusted): 1988 2017
Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(FDPC(-1))	-0.621107	0.179124	-3.467470	0.0017
C	0.007477	0.003552	2.105037	0.0444

R-squared	0.300408	Mean dependent var	0.001072
Adjusted R-squared	0.275423	S.D. dependent var	0.019521
S.E. of regression	0.016617	Akaike info criterion	-5.292478
Sum squared resid	0.007731	Schwarz criterion	-5.199064
Log likelihood	81.38716	F-statistic	12.02335
Durbin-Watson stat	1.917846	Prob(F-statistic)	0.001715

Null Hypothesis: RCAP has a unit root
Exogenous: Constant
Bandwidth: 7 (Newey-West using Bartlett kernel)

		Adj. t-Stat	Prob.*

Phillips-Perron test statistic		-0.263926	0.9194
Test critical values:	1% level	-3.661661	
	5% level	-2.960411	
	10% level	-2.619160	

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

Residual variance (no correction)	0.001943
HAC corrected variance (Bartlett kernel)	0.001193

Phillips-Perron Test Equation
Dependent Variable: D(RCAP)
Method: Least Squares
Date: 01/13/19 Time: 05:02
Sample (adjusted): 1987 2017
Included observations: 31 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RCAP(-1)	-0.051410	0.078071	-0.658500	0.5154
C	0.013575	0.010728	1.265367	0.2158

R-squared	0.014732	Mean dependent var	0.009008
Adjusted R-squared	-0.019243	S.D. dependent var	0.045136
S.E. of regression	0.045568	Akaike info criterion	-3.276862
Sum squared resid	0.060218	Schwarz criterion	-3.184346
Log likelihood	52.79135	F-statistic	0.433622
Durbin-Watson stat	2.065120	Prob(F-statistic)	0.515412

Null Hypothesis: D(RCAP) has a unit root
Exogenous: Constant
Bandwidth: 17 (Newey-West using Bartlett kernel)

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-7.019509	0.0000
Test critical values:	1% level	-3.670170	
	5% level	-2.963972	
	10% level	-2.621007	

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

Residual variance (no correction)	0.002021

HAC corrected variance (Bartlett kernel)	0.000563

Phillips-Perron Test Equation
Dependent Variable: D(RCAP,2)
Method: Least Squares
Date: 01/13/19 Time: 05:03
Sample (adjusted): 1988 2017
Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(RCAP(-1))	-1.080833	0.189941	-5.690353	0.0000
C	0.009946	0.008629	1.152560	0.2588

R-squared	0.536271	Mean dependent var	0.001378
Adjusted R-squared	0.519709	S.D. dependent var	0.067153
S.E. of regression	0.046539	Akaike info criterion	-3.232721
Sum squared resid	0.060644	Schwarz criterion	-3.139308
Log likelihood	50.49082	F-statistic	32.38012
Durbin-Watson stat	2.039339	Prob(F-statistic)	0.000004

Null Hypothesis: RGCF has a unit root
Exogenous: Constant
Bandwidth: 3 (Newey-West using Bartlett kernel)

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-1.639021	0.4513
Test critical values:	1% level	-3.661661	
	5% level	-2.960411	
	10% level	-2.619160	

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

Residual variance (no correction)	0.000396
HAC corrected variance (Bartlett kernel)	0.000400

Phillips-Perron Test Equation
Dependent Variable: D(RGCF)
Method: Least Squares
Date: 01/13/19 Time: 05:04

Sample (adjusted): 1987 2017
Included observations: 31 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RGCF(-1)	-0.226739	0.139455	-1.625888	0.1148
C	0.029901	0.018019	1.659375	0.1078

R-squared	0.083540	Mean dependent var	0.001226
Adjusted R-squared	0.051938	S.D. dependent var	0.021131
S.E. of regression	0.020575	Akaike info criterion	-4.867107
Sum squared resid	0.012277	Schwarz criterion	-4.774592
Log likelihood	77.44016	F-statistic	2.643513
Durbin-Watson stat	1.790295	Prob(F-statistic)	0.114793

Null Hypothesis: D(RGCF) has a unit root
Exogenous: Constant
Bandwidth: 2 (Newey-West using Bartlett kernel)

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-6.536880	0.0000
Test critical values:	1% level	-3.670170	
	5% level	-2.963972	
	10% level	-2.621007	

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

Residual variance (no correction)	0.000393
HAC corrected variance (Bartlett kernel)	0.000256

Phillips-Perron Test Equation
Dependent Variable: D(RGCF,2)
Method: Least Squares
Date: 01/13/19 Time: 05:05
Sample (adjusted): 1988 2017
Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(RGCF(-1))	-1.097041	0.177743	-6.172055	0.0000
C	0.002580	0.003751	0.687978	0.4971

R-squared	0.576363	Mean dependent var	0.001528

Adjusted R-squared	0.561233	S.D. dependent var	0.030981
S.E. of regression	0.020521	Akaike info criterion	-4.870356
Sum squared resid	0.011792	Schwarz criterion	-4.776943
Log likelihood	75.05534	F-statistic	38.09426
Durbin-Watson stat	2.116406	Prob(F-statistic)	0.000001

Null Hypothesis: RMSP has a unit root
Exogenous: Constant
Bandwidth: 3 (Newey-West using Bartlett kernel)

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-0.994069	0.7429
Test critical values:	1% level	-3.661661	
	5% level	-2.960411	
	10% level	-2.619160	

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

Residual variance (no correction)	2.72E-05
HAC corrected variance (Bartlett kernel)	3.87E-05

Phillips-Perron Test Equation
Dependent Variable: D(RMSP)
Method: Least Squares
Date: 01/13/19 Time: 05:06
Sample (adjusted): 1987 2017
Included observations: 31 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RMSP(-1)	-0.052668	0.072657	-0.724879	0.4743
C	0.004374	0.005739	0.762196	0.4521

R-squared	0.017796	Mean dependent var	0.000274
Adjusted R-squared	-0.016073	S.D. dependent var	0.005352
S.E. of regression	0.005395	Akaike info criterion	-7.544452
Sum squared resid	0.000844	Schwarz criterion	-7.451936
Log likelihood	118.9390	F-statistic	0.525450
Durbin-Watson stat	1.629018	Prob(F-statistic)	0.474335

Null Hypothesis: D(RMSP) has a unit root
Exogenous: Constant

Bandwidth: 3 (Newey-West using Bartlett kernel)

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-4.540563	0.0011
Test critical values:	1% level	-3.670170	
	5% level	-2.963972	
	10% level	-2.621007	

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

Residual variance (no correction)	2.80E-05
HAC corrected variance (Bartlett kernel)	3.06E-05

Phillips-Perron Test Equation
Dependent Variable: D(RMSP,2)
Method: Least Squares
Date: 01/13/19 Time: 05:08
Sample (adjusted): 1988 2017
Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(RMSP(-1))	-0.855856	0.190538	-4.491788	0.0001
C	0.000222	0.001001	0.221992	0.8259

R-squared	0.418800	Mean dependent var	0.000147
Adjusted R-squared	0.398042	S.D. dependent var	0.007062
S.E. of regression	0.005479	Akaike info criterion	-7.511297
Sum squared resid	0.000841	Schwarz criterion	-7.417884
Log likelihood	114.6694	F-statistic	20.17616
Durbin-Watson stat	1.912438	Prob(F-statistic)	0.000111

Appendix 4: ARDL Result of Model 1

ARDL Cointegrating And Long Run Form
Dependent Variable: CTSA
Selected Model: ARDL(1, 2, 2, 2, 2, 2, 2, 2, 2, 2)
Date: 01/24/19 Time: 14:40
Sample: 1986 2017

Cointegrating Form				
Variable	Coefficient	Std. Error	t-Statistic	Prob.

D(CTSA(-1))	1.665685	0.097520	17.080520	0.0372
D(EXCR)	0.146310	0.020325	7.198525	0.0079
D(EXCR(-1))	0.366014	0.042023	8.709812	0.0028
D(FDMS)	3.991528	0.422322	9.451384	0.0071
D(FDMS(-1))	3.919045	0.394002	9.946752	0.0038
D(FDPC)	-79.886036	25.783505	-3.098339	0.0088
D(FDPC(-1))	-171.747162	15.372435	-11.172411	0.0068
D(INFR)	0.470559	0,453227	1.038241	0.5717
D(INFR(-1))	0.032760	0.031137	1.052097	0.4838
D(GEP)	0.311267	0.029363	10.600510	0.0099
D(GEP(-1))	0.217018	0.025372	8.553455	0.0041
D(INTR)	-1.262894	0.111578	-11.318465	0.0061
D(INTR(-1))	-0.222630	0.080134	-2.778232	0.0200
D(RCAP)	26.492505	5.819335	4.552497	0.0077
D(RCAP(-1))	69.734653	7.871935	8.858642	0.0016
D(RFDI)	2.842312	0.353508	8.040304	0.0028
D(RFDI(-1))	-0.709363	0.133629	-5.308441	0.0085
D(RGCF)	-175.396972	21.484087	-8.164041	0.0076
D(RGCF(-1))	-346.393246	44.251943	-7.827752	0.0009
CointEq(-1)	-0.665685	0.097520	-6.826164	0.0026

Cointeq = CTSA - (0.4363*EXCR +.4754*FDMS -8.9563*FDPC + 0.2320 *INFR + 1.6277*GEP + 0.0772*INTR -107.8169*RCAP -6.4999*RFDI + 76.7233*RGCF + 34.8363)

Long Run Coefficients

Variable	Coefficient	Std. Error	t-Statistic	Prob.
EXCR	0.436343	0.048317	9.030840	0.0002
FDMS	4.475358	0.748445	5.979540	0.0055
FDPC	-8.956261	34.210732	-0.261797	0.8370
INFR	0.232036	0.155833	1.489004	0.1503
GEP	1.627695	0.183147	8.887390	0.0013
INTR	0.077182	0.146657	0.526273	0.6916
RCAP	-107.816921	20.539910	-5.249143	0.0098
RFDI	-6.499928	0.656987	-9.893540	0.0041
RGCF	76.723348	86.490504	0.887073	0.5381
C	34.836324	5.753813	6.054476	0.0042

Date: 01/24/19 Time: 14:41
Sample: 1988 2017
Included observations: 30
Null Hypothesis: No long-run relationships exist

Test Statistic	Value	k
F-statistic	73.31909	9

Critical Value Bounds		
Significance	I0 Bound	I1 Bound
10%	1.88	2.99
5%	2.14	3.3
2.5%	2.37	3.6
1%	2.65	3.97

Test Equation:
Dependent Variable: D(CTSA)
Method: Least Squares
Date: 01/24/19 Time: 14:41
Sample: 1988 2017
Included observations: 30

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(EXCR)	0.146310	0.020325	7.198525	0.0879
D(EXCR(-1))	0.366014	0.042023	8.709812	0.0028
D(FDMS)	3.991528	0.422322	9.451384	0.0071
D(FDMS(-1))	3.919045	0.394002	9.946752	0.0038
D(FDPC)	-79.88604	25.78351	-3.098339	0.0388
D(FDPC(-1))	-171.7472	15.37244	-11.17241	0.0068
D(INFR)	-0.470559	0.053227	-8.840651	0.0017
D(INFR(-1))	-0.032760	0.031137	-1.052097	0.4838
D(GEP)	-0.311267	0.029363	-10.60051	0.0099
D(GEP(-1))	0.217018	0.025372	8.553455	0.0041
D(INTR)	-1.262894	0.111578	-11.31847	0.0061
D(INTR(-1))	-0.222630	0.080134	-2.778232	0.0004
D(RCAP)	26.49250	5.819335	4.552497	0.0377
D(RCAP(-1))	69.73465	7.871935	8.858642	0.0016
D(RFDI)	2.842312	0.353508	8.040304	0.0088
D(RFDI(-1))	-0.709363	0.133629	-5.308441	0.0185
D(RGCF)	-175.3970	21.48409	-8.164041	0.0076
D(RGCF(-1))	-346.3932	44.25194	-7.827752	0.0009
C	-23.19000	6.275125	-3.695544	0.0082
EXCR(-1)	-0.290467	0.017555	-16.54632	0.0004
FDMS(-1)	2.979176	0.282322	10.55240	0.0031
FDPC(-1)	-5.962044	22.97394	-0.259513	0.8384
INFR(-1)	-0.154463	0.035771	-4.318096	0.0449
GEP(-1)	-1.083531	0.103238	-10.49546	0.0005
INTR(-1)	-0.051379	0.100185	-0.512837	0.6983
RCAP(-1)	-71.77205	13.23606	-5.422464	0.0161
RFDI(-1)	4.326901	0.569586	7.596579	0.0033
RGCF(-1)	-51.07354	53.62676	-0.952389	0.5155
CTSA(-1)	0.665685	0.097520	6.826164	0.0026

R-squared	0.999470	Mean dependent var	0.486667
Adjusted R-	0.984638	S.D. dependent var	4.894964

squared			
S.E. of regression	0.606691	Akaike info criterion	0.370542
Sum squared resid	0.368074	Schwarz criterion	1.725033
Log likelihood	23.44187	Hannan-Quinn criter.	0.803855
F-statistic	67.38662	Durbin-Watson stat	2.172714
Prob(F-statistic)	0.000087		

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	1.050486	Prob. F(2,10)	0.3854
Obs*R-squared	5.382222	Prob. Chi-Square(2)	0.0678

Test Equation:
Dependent Variable: RESID
Method: ARDL
Date: 01/24/19 Time: 15:32
Sample: 1987 2017
Included observations: 31
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CTSA(-1)	0.092440	0.147831	0.625308	0.5458
EXCR	0.061893	0.074575	0.829948	0.4259
EXCR(-1)	-0.058084	0.089822	-0.646659	0.5324
FDMS	0.132380	0.845183	0.156628	0.8787
FDMS(-1)	-0.100042	0.682897	-0.146497	0.8864
FDPC	17.16629	60.94497	0.281669	0.7839
FDPC(-1)	-43.95044	62.54998	-0.702645	0.4983
GEP	-0.039875	0.053747	-0.741899	0.4752
GEP(-1)	-0.014977	0.045767	-0.327236	0.7502
INFR	0.046983	0.068652	0.684369	0.5093
INFR(-1)	0.062414	0.098310	0.634868	0.5398
INTR	-0.044377	0.233434	-0.190103	0.8530
INTR(-1)	0.016735	0.246085	0.068006	0.9471
RCAP	-1.026512	18.40765	-0.055766	0.9566
RFDI	-0.376181	0.589631	-0.637993	0.5378
RFDI(-1)	-0.230846	0.415501	-0.555585	0.5907
RGCF	3.423526	57.10809	0.059948	0.9534
RGCF(-1)	11.91388	45.68147	0.260803	0.7995
C	-4.060505	8.879283	-0.457301	0.6572
RESID(-1)	-0.667918	0.539792	-1.237362	0.2442
RESID(-2)	-0.588661	0.542124	-1.085843	0.3030

R-squared	0.173620	Mean dependent var	2.01E-15
Adjusted R-squared	-1.479140	S.D. dependent var	1.892386
S.E. of regression	2.979616	Akaike info criterion	5.244902
Sum squared resid	88.78110	Schwarz criterion	6.216313
Log likelihood	-60.29599	Hannan-Quinn criter.	5.561558
F-statistic	0.105049	Durbin-Watson stat	1.927645
Prob(F-statistic)	0.999987		

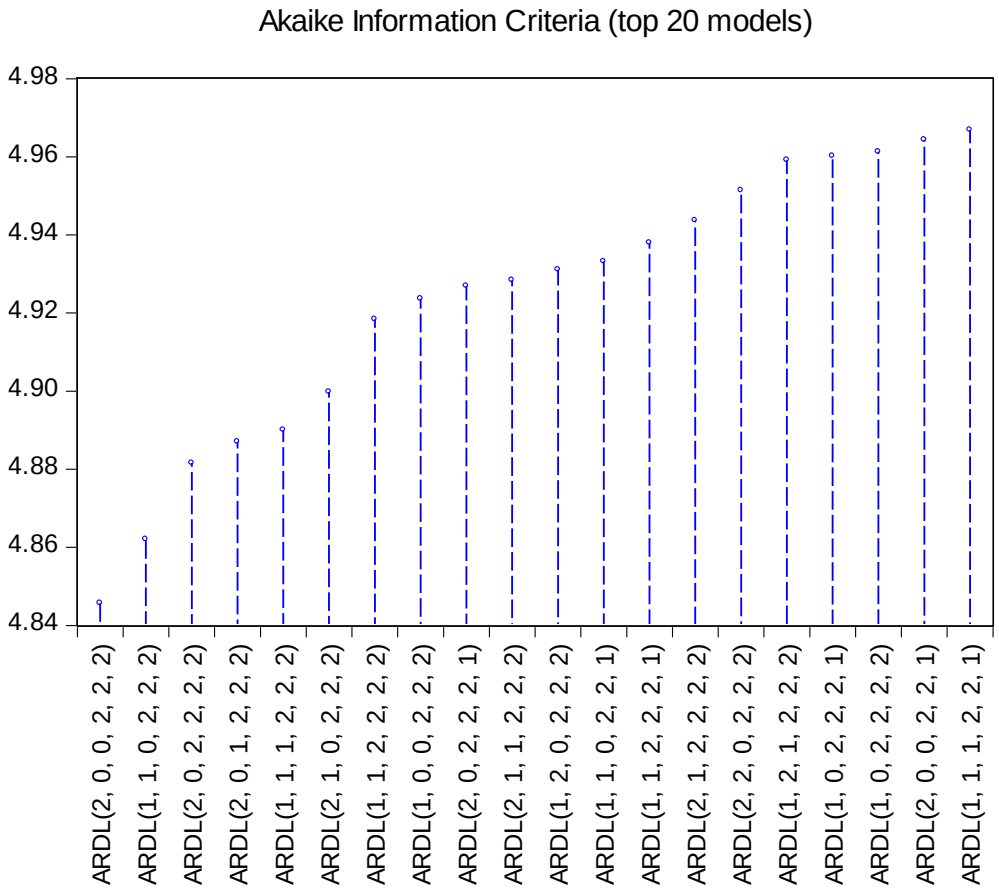
Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	2.705748	Prob. F(28,1)	0.6519
Obs*R-squared	29.60918	Prob. Chi-Square(28)	0.5821
Scaled explained SS	0.072245	Prob. Chi-Square(28)	1.0000

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 01/24/19 Time: 14:48
Sample: 1988 2017
Included observations: 30

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.370992	0.166259	2.231407	0.2682
CTSA(-1)	-0.005479	0.002584	-2.120615	0.2805
EXCR	-0.000865	0.000539	-1.606323	0.3545
EXCR(-1)	-0.000843	0.000718	-1.173522	0.4493
EXCR(-2)	0.002596	0.001113	2.331865	0.2579
FDMS	-0.016254	0.011189	-1.452586	0.3838
FDMS(-1)	-0.002430	0.008122	-0.299199	0.8149
FDMS(-2)	0.013820	0.010439	1.323887	0.4118
FDPC	-0.083410	0.683134	-0.122099	0.9227
FDPC(-1)	-0.090419	0.410409	-0.220315	0.8619
FDPC(-2)	0.785107	0.407293	1.927624	0.3047
INFR	0.002966	0.001410	2.103149	0.2826
INFR(-1)	-0.001025	0.000966	-1.060645	0.4813
INFR(-2)	-0.000938	0.000825	-1.136981	0.4592
GEP	0.001333	0.000778	1.712916	0.3364
GEP(-1)	0.003061	0.001424	2.149430	0.2772
GEP(-2)	0.001282	0.000672	1.906808	0.3075
INTR	0.004612	0.002956	1.560183	0.3629
INTR(-1)	-0.001919	0.002611	-0.735032	0.5965
INTR(-2)	0.000111	0.002123	0.052478	0.9666
RCAP	-0.190737	0.154183	-1.237083	0.4328
RCAP(-1)	0.420211	0.241574	1.739469	0.3322
RCAP(-2)	0.457210	0.208567	2.192152	0.2725
RFDI	-0.020186	0.009366	-2.155169	0.2766
RFDI(-1)	-0.007914	0.004989	-1.586272	0.3581
RFDI(-2)	-0.002992	0.003541	-0.845184	0.5533
RGCF	0.349535	0.569221	0.614060	0.6494
RGCF(-1)	-0.201934	0.598686	-0.337296	0.7929
RGCF(-2)	-2.361336	1.172455	-2.014010	0.2934

R-squared	0.986973	Mean dependent var	0.012269
Adjusted R-squared	0.622204	S.D. dependent var	0.026152
S.E. of regression	0.016074	Akaike info criterion	-6.891058
Sum squared resid	0.000258	Schwarz criterion	-5.536567
Log likelihood	132.3659	Hannan-Quinn criter.	-6.457744
F-statistic	2.705748	Durbin-Watson stat	2.072714
Prob(F-statistic)	0.651869		



Appendix 5: ARDL Result of Model 2

ARDL Cointegrating And Long Run Form
Dependent Variable: MFGI
Selected Model: ARDL(1, 1, 1, 0, 1, 1, 1, 0, 1, 1)
Date: 01/24/19 Time: 15:05
Sample: 1986 2017
Included observations: 31

Cointegrating Form

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(EXCR)	0.103136	0.135247	0.762571	0.4593
D(FDMS)	-3.093347	1.768414	-1.749221	0.1038
D(FDPC)	210.749192	104.708108	2.012730	0.0653
D(GEP)	0.361483	0.117476	3.077069	0.0088
D(INFR)	0.038220	0.175855	0.217340	0.8313

D(INTR)	3.186527	0.668662	4.765530	0.0004
D(RCAP)	-111.845204	51.403965	-2.175809	0.0486
D(RFDI)	2.123573	1.436797	1.477991	0.1632
D(RGCF)	-331.152963	130.811812	-2.531522	0.0251
CointEq(-1)	-0.696467	0.177738	-3.918504	0.0010

Cointeq = MFGI - (-0.0924*EXCR -5.5291*FDMS - 92.2075*FDPC +0.5022*GEP -0.2086*INFR + 6.7317*INTR -102.0051*RCAP +0.2401 *RFDI + 41.2608*RGCF + 93.5982)

Long Run Coefficients

Variable	Coefficient	Std. Error	t-Statistic	Prob.
EXCR	-0.092449	0.067499	-1.369646	0.1940
FDMS	-5.529123	1.488678	-3.714116	0.0026
FDPC	-92.207478	80.343900	-1.147660	0.6826
GEP	0.502236	0.193032	2.601832	0.0219
INFR	-0.208559	0.194121	-1.074380	0.3022
INTR	6.731719	0.710400	9.475952	0.0000
RCAP	-102.005063	41.300935	-2.469800	0.0281
RFDI	0.240085	1.704480	0.140855	0.8901
RGCF	41.260763	129.552833	0.318486	0.7552
C	93.598239	17.964066	5.210304	0.0002

R-squared	0.961186	Mean dependent var	128.6194
Adjusted R-squared	0.910429	S.D. dependent var	25.67914
S.E. of regression	7.685364	Akaike info criterion	7.208765
Sum squared resid	767.8427	Schwarz criterion	8.041403
Log likelihood	-93.73586	Hannan-Quinn criter.	7.480184
F-statistic	18.93703	Durbin-Watson stat	2.150326
Prob(F-statistic)	0.000002		

ARDL Bounds Test
Date: 01/24/19 Time: 15:17
Sample: 1987 2017
Included observations: 31
Null Hypothesis: No long-run relationships exist

Test Statistic	Value	k
F-statistic	5.453927	9

Critical Value Bounds

Significance	I0 Bound	I1 Bound

10%	1.88	2.99
5%	2.14	3.3
2.5%	2.37	3.6
1%	2.65	3.97

Test Equation:
Dependent Variable: D(MFGI)
Method: Least Squares
Date: 01/24/19 Time: 15:17
Sample: 1987 2017
Included observations: 31

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(EXCR)	0.237061	0.161369	1.469055	0.1656
D(FDMS)	-1.031774	2.464227	-0.418701	0.6823
D(GEP)	-0.364963	0.146307	-2.494498	0.0269
D(INFR)	-0.038645	0.218493	-0.176871	0.8623
D(INTR)	2.701494	0.860756	3.138513	0.0078
D(RFDI)	0.723160	1.559999	0.463564	0.6506
D(RGCF)	-381.6074	181.3728	-2.103995	0.0554
C	65.61352	32.03619	2.048106	0.0613
EXCR(-1)	-0.150373	0.074775	-2.010999	0.0655
FDMS(-1)	-2.910955	2.163757	-1.345325	0.2015
FDPC(-1)	52.52566	139.8587	0.375562	0.7133
GEP(-1)	-0.511420	0.271291	-1.885135	0.0820
INFR(-1)	-0.039339	0.231535	-0.169903	0.8677
INTR(-1)	6.101671	1.696016	3.597650	0.0032
RCAP(-1)	-21.53558	65.73702	-0.327602	0.7484
RFDI(-1)	-2.219005	2.048412	-1.083280	0.2984
RGCF(-1)	49.76694	207.3559	0.240007	0.8141
MFGI(-1)	-0.899550	0.208486	-4.314669	0.0008

R-squared	0.871396	Mean dependent var	1.100000
Adjusted R-squared	0.703222	S.D. dependent var	16.64464
S.E. of regression	9.067558	Akaike info criterion	7.539535
Sum squared resid	1068.868	Schwarz criterion	8.372173
Log likelihood	-98.86280	Hannan-Quinn criter.	7.810955
F-statistic	5.181506	Durbin-Watson stat	2.258468
Prob(F-statistic)	0.002236		

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	3.296843	Prob. F(2,11)	0.0755
Obs*R-squared	4.618050	Prob. Chi-Square(2)	0.0630

Test Equation:
Dependent Variable: RESID
Method: ARDL
Date: 01/24/19 Time: 15:06
Sample: 1987 2017
Included observations: 31
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
MFGI(-1)	0.072418	0.155506	0.465693	0.6505
EXCR	-0.001185	0.129772	-0.009133	0.9929
EXCR(-1)	0.026983	0.164049	0.164483	0.8723
FDMS	-1.357218	1.620674	-0.837440	0.4202
FDMS(-1)	1.240576	1.528352	0.811708	0.4342
FDPC	1.468160	95.01136	0.015452	0.9879
GEP	0.000453	0.103136	0.004393	0.9966
GEP(-1)	-0.048151	0.098852	-0.487101	0.6357
INFR	-0.013442	0.153028	-0.087840	0.9316
INFR(-1)	-0.060259	0.206714	-0.291508	0.7761
INTR	-0.374499	0.597047	-0.627253	0.5433
INTR(-1)	-0.455636	0.893647	-0.509862	0.6202
RCAP	-26.28746	48.82425	-0.538410	0.6010
RFDI	0.690628	1.264009	0.546379	0.5957
RFDI(-1)	0.152192	0.826656	0.184106	0.8573
RGCF	86.93228	118.1454	0.735808	0.4772
RGCF(-1)	-46.02008	95.67030	-0.481028	0.6399
C	3.297217	25.17624	0.130965	0.8982
RESID(-1)	-0.791199	0.321469	-2.461200	0.0316
RESID(-2)	-0.570160	0.337530	-1.689213	0.1193

R-squared	0.374776	Mean dependent var	-2.84E-14
Adjusted R-squared	-0.705157	S.D. dependent var	5.059126
S.E. of regression	6.606291	Akaike info criterion	6.868152
Sum squared resid	480.0739	Schwarz criterion	7.793306
Log likelihood	-86.45636	Hannan-Quinn criter.	7.169729
F-statistic	0.347036	Durbin-Watson stat	2.396385
Prob(F-statistic)	0.979232		

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	0.398889	Prob. F(17,13)	0.9611
Obs*R-squared	10.62703	Prob. Chi-Square(17)	0.8753
Scaled explained SS	2.422164	Prob. Chi-Square(17)	1.0000

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 01/24/19 Time: 15:07
Sample: 1987 2017
Included observations: 31

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	80.38688	189.6114	0.423956	0.6785
MFGI(-1)	0.843591	1.154548	0.730667	0.4779
EXCR	-0.337408	0.878535	-0.384058	0.7071
EXCR(-1)	0.524321	1.125434	0.465884	0.6490
FDMS	-4.408630	11.48721	-0.383786	0.7073
FDMS(-1)	4.495994	10.40138	0.432250	0.6726

FDPC	11.00746	680.1598	0.016184	0.9873
GEP	0.111755	0.763099	0.146449	0.8858
GEP(-1)	0.180146	0.719000	0.250550	0.8061
INFR	0.030079	1.142312	0.026332	0.9794
INFR(-1)	-0.064427	1.517353	-0.042460	0.9668
INTR	-1.652454	4.343473	-0.380445	0.7098
INTR(-1)	-5.427102	6.616736	-0.820208	0.4269
RCAP	84.93680	333.9083	0.254372	0.8032
RFDI	2.280371	9.333104	0.244332	0.8108
RFDI(-1)	0.079724	6.189910	0.012880	0.9899
RGCF	199.2820	849.7235	0.234526	0.8182
RGCF(-1)	-720.7846	708.7405	-1.016994	0.3277

R-squared	0.342808	Mean dependent var	24.76912
Adjusted R-squared	-0.516598	S.D. dependent var	40.53777
S.E. of regression	49.92236	Akaike info criterion	10.95107
Sum squared resid	32399.14	Schwarz criterion	11.78371
Log likelihood	-151.7415	Hannan-Quinn criter.	11.22249
F-statistic	0.398889	Durbin-Watson stat	2.301872
Prob(F-statistic)	0.961083		

Ramsey RESET Test
Equation: UNTITLED
Specification: MFGI MFGI(-1) EXCR EXCR(-1) FDMS FDMS(-1) FDPC GEP GEP(-1) INFR INFR(-1) INTR INTR(-1) RCAP RFDI RFDI(-1) RGCF RGCF(-1) C
Omitted Variables: Squares of fitted values

	Value	df	Probability
t-statistic	0.278122	12	0.7857
F-statistic	0.077352	(1, 12)	0.7857

F-test summary:

	Sum of Sq.	df	Mean Squares
Test SSR	4.917796	1	4.917796
Restricted SSR	767.8427	13	59.06482
Unrestricted SSR	762.9249	12	63.57708

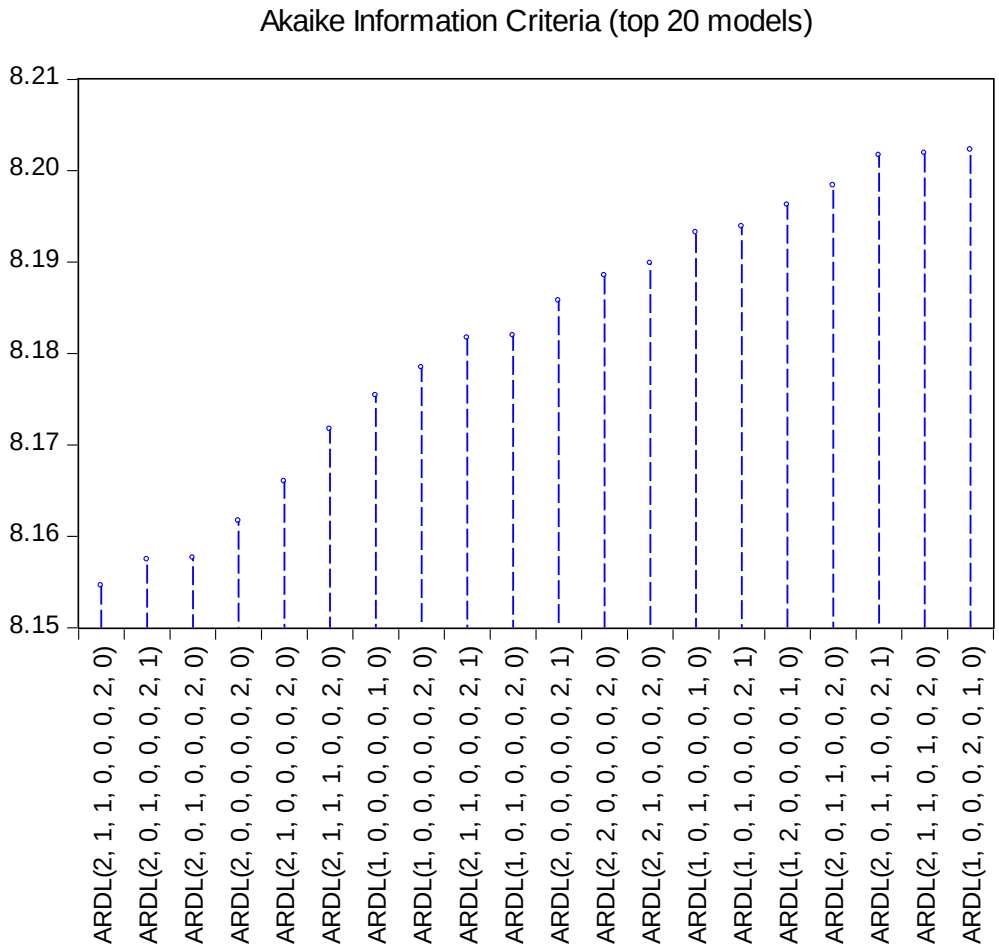
Unrestricted Test Equation:
Dependent Variable: MFGI
Method: ARDL
Date: 01/24/19 Time: 15:08
Sample: 1987 2017
Included observations: 31
Maximum dependent lags: 1 (Automatic selection)
Model selection method: Akaike info criterion (AIC)
Dynamic regressors (1 lag, automatic):
Fixed regressors: C

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
MFGI(-1)	-0.120957	0.204347	-0.591918	0.5649
EXCR	0.127897	0.166181	0.769629	0.4564

EXCR(-1)	-0.263983	0.279370	-0.944921	0.3633
FDMS	-3.786958	3.096092	-1.223141	0.2448
FDMS(-1)	-3.801454	3.422773	-1.110636	0.2885
FDPC	260.6280	209.6779	1.242992	0.2376
GEP	-0.465928	0.394821	-1.180100	0.2608
GEP(-1)	-0.245336	0.232214	-1.056508	0.3115
INFR	0.045858	0.184504	0.248549	0.8079
INFR(-1)	-0.348982	0.381887	-0.913837	0.3788
INTR	4.158820	3.564093	1.166867	0.2659
INTR(-1)	5.369702	4.355364	1.232894	0.2412
RCAP	-134.8389	98.38373	-1.370540	0.1956
RFDI	2.706879	2.573089	1.051996	0.3135
RFDI(-1)	-3.031737	2.520797	-1.202690	0.2523
RGCF	-411.8127	320.2003	-1.286110	0.2227
RGCF(-1)	478.7106	384.9061	1.243708	0.2374
C	108.5257	36.97169	2.935372	0.0125
FITTED^2	-0.001037	0.003730	-0.278122	0.7857

R-squared	0.961434	Mean dependent var	128.6194
Adjusted R-squared	0.903586	S.D. dependent var	25.67914
S.E. of regression	7.973523	Akaike info criterion	7.266856
Sum squared resid	762.9249	Schwarz criterion	8.145751
Log likelihood	-93.63627	Hannan-Quinn criter.	7.553354
F-statistic	16.61992	Durbin-Watson stat	2.742461
Prob(F-statistic)	0.000008		

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



Appendix 6: ARDL Result of Model 3

Dependent Variable: RMSP
Method: ARDL
Date: 01/24/19 Time: 15:10
Sample (adjusted): 1988 2017
Included observations: 30 after adjustments
Maximum dependent lags: 1 (Automatic selection)
Model selection method: Akaike info criterion (AIC)
Dynamic regressors (2 lags, automatic): RGCF RFDI RCAP INTR INFR GEP FDPC FDMS EXCR
Fixed regressors: C
Number of models evalulated: 19683
Selected Model: ARDL(1, 2, 1, 2, 2, 0, 2, 1, 0, 2)

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
RMSP(-1)	0.460013	0.122835	3.744980	0.0072
RGCF	-0.146392	0.070921	-2.064170	0.0779
RGCF(-1)	-0.061025	0.065130	-0.936971	0.3800

RGCF(-2)	-0.323891	0.100378	-3.226726	0.0145
RFDI	-0.004827	0.001077	-4.482828	0.0029
RFDI(-1)	-0.003789	0.000601	-6.304745	0.0004
RCAP	0.014148	0.019570	0.722924	0.4932
RCAP(-1)	-0.035947	0.027909	-1.288001	0.2387
RCAP(-2)	-0.039592	0.021651	-1.828678	0.1102
INTR	0.000805	0.000292	2.759148	0.0281
INTR(-1)	0.000163	0.000329	0.495071	0.6357
INTR(-2)	-0.000705	0.000297	-2.378467	0.0490
INFR	0.000687	0.000149	4.606535	0.0025
GEP	0.000232	8.34E-05	2.785086	0.0271
GEP(-1)	0.000740	0.000143	5.163626	0.0013
GEP(-2)	0.000363	6.79E-05	5.337368	0.0011
FDPC	0.141968	0.076604	1.853273	0.1063
FDPC(-1)	0.168436	0.051963	3.241480	0.0142
FDMS	0.000502	0.000781	0.642388	0.5411
EXCR	-0.000175	6.87E-05	-2.550994	0.0380
EXCR(-1)	-0.000386	8.97E-05	-4.304522	0.0035
EXCR(-2)	0.000509	9.70E-05	5.247982	0.0012
C	0.067084	0.019315	3.473150	0.0104

R-squared	0.990591	Mean dependent var	0.077674
Adjusted R-squared	0.961019	S.D. dependent var	0.013901
S.E. of regression	0.002745	Akaike info criterion	-8.880345
Sum squared resid	5.27E-05	Schwarz criterion	-7.806094
Log likelihood	156.2052	Hannan-Quinn criter.	-8.536683
F-statistic	33.49776	Durbin-Watson stat	2.093556
Prob(F-statistic)	0.000041		

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

ARDL Cointegrating And Long Run Form
Dependent Variable: RMSP
Selected Model: ARDL(1, 2, 1, 2, 2, 0, 2, 1, 0, 2)
Date: 01/24/19 Time: 15:11
Sample: 1986 2017
Included observations: 30

Cointegrating Form

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(RGCF)	-0.146392	0.070921	-2.064170	0.0779
D(RGCF(-1))	0.323891	0.100378	3.226726	0.0145
D(RFDI)	-0.004827	0.001077	-4.482828	0.0029
D(RCAP)	0.014148	0.019570	0.722924	0.4932
D(RCAP(-1))	0.039592	0.021651	1.828678	0.1102
D(INTR)	0.000805	0.000292	2.759148	0.0281
D(INTR(-1))	0.000705	0.000297	2.378467	0.0490
D(INFR)	0.000687	0.000149	4.606535	0.0025
D(GEP)	0.000232	0.000083	2.785086	0.0271
D(GEP(-1))	-0.000363	0.000068	-5.337368	0.0011
D(FDPC)	0.141968	0.076604	1.853273	0.1063
D(FDMS)	0.000502	0.000781	0.642388	0.5411
D(EXCR)	-0.000175	0.000069	-2.550994	0.0380

D(EXCR(-1))	-0.000509	0.000097	-5.247982	0.0012
CointEq(-1)	-0.539987	0.122835	-4.396053	0.0032

Cointeq = RMSP - (-0.9839*RGCF -0.0160*RFDI -0.1137*RCAP + 0.0005 *INTR + 0.0013*INFR + 0.0025*GEP - 0.5748*FDPC + 0.0009*FDMS -0.0001*EXCR + 0.1242)

Long Run Coefficients

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RGCF	-0.983927	0.304519	-3.231083	0.0144
RFDI	-0.015957	0.002842	-5.615581	0.0008
RCAP	-0.113691	0.073977	-1.536851	0.1682
INTR	0.000487	0.000665	0.732457	0.4877
INFR	0.001273	0.000211	6.045716	0.0005
GEP	0.002473	0.000557	4.442807	0.0030
FDPC	-0.574837	0.119893	-4.794580	0.0020
FDMS	0.000929	0.001516	0.612993	0.5593
EXCR	-0.000097	0.000093	-1.041593	0.3322
C	0.124233	0.021524	5.771930	0.0007

R-squared	0.990591	Mean dependent var	0.077674
Adjusted R-squared	0.961019	S.D. dependent var	0.013901
S.E. of regression	0.002745	Akaike info criterion	-8.880345
Sum squared resid	5.27E-05	Schwarz criterion	-7.806094
Log likelihood	156.2052	Hannan-Quinn criter.	-8.536683
F-statistic	33.49776	Durbin-Watson stat	2.093556
Prob(F-statistic)	0.000041		

ARDL Bounds Test
Date: 01/24/19 Time: 15:12
Sample: 1988 2017
Included observations: 30
Null Hypothesis: No long-run relationships exist

Test Statistic	Value	k
F-statistic	4.370299	9

Critical Value Bounds

Significance	I0 Bound	I1 Bound
10%	1.88	2.99
5%	2.14	3.3
2.5%	2.37	3.6
1%	2.65	3.97

Test Equation:
Dependent Variable: D(RMSP)
Method: Least Squares
Date: 01/24/19 Time: 15:12
Sample: 1988 2017
Included observations: 30

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(RGCF)	-0.022048	0.107786	-0.204555	0.8437
D(RGCF(-1))	-0.049513	0.099624	-0.497002	0.6344
D(RFDI)	-0.001500	0.001525	-0.983224	0.3583
D(RCAP)	0.041524	0.035130	1.182015	0.2758
D(RCAP(-1))	0.057022	0.053422	1.067390	0.3212
D(INTR)	-0.000223	0.000617	-0.361797	0.7282
D(INTR(-1))	0.000271	0.000658	0.412003	0.6927
D(GEP)	6.21E-05	0.000163	0.380122	0.7151
D(GEP(-1))	-0.000241	0.000128	-1.880671	0.1021
D(FDPC)	-0.082316	0.117655	-0.699635	0.5067
D(EXCR)	2.38E-05	0.000109	0.218855	0.8330
D(EXCR(-1))	-0.000224	0.000133	-1.680548	0.1367
C	-0.011557	0.020653	-0.559586	0.5932
RGCF(-1)	0.011847	0.235116	0.050388	0.9612
RFDI(-1)	-0.003978	0.002229	-1.785041	0.1174
RCAP(-1)	0.014270	0.069687	0.204777	0.8436
INTR(-1)	-0.000379	0.000841	-0.450771	0.6658
INFR(-1)	0.000102	0.000138	0.739686	0.4836
GEP(-1)	0.000594	0.000462	1.285940	0.2394
FDPC(-1)	-0.020767	0.096173	-0.215929	0.8352
FDMS(-1)	0.001319	0.002137	0.617251	0.5566
EXCR(-1)	3.74E-05	8.82E-05	0.424464	0.6840
RMSP(-1)	-0.080046	0.198489	-0.403278	0.6988

R-squared	0.776920	Mean dependent var	0.000235
Adjusted R-squared	0.075812	S.D. dependent var	0.005439
S.E. of regression	0.005229	Akaike info criterion	-7.591289
Sum squared resid	0.000191	Schwarz criterion	-6.517037
Log likelihood	136.8693	Hannan-Quinn criter.	-7.247626
F-statistic	1.108132	Durbin-Watson stat	2.286678
Prob(F-statistic)	0.477836		

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	1.829835	Prob. F(2,5)	0.2288
Obs*R-squared	12.73948	Prob. Chi-Square(2)	0.8200

Test Equation:
Dependent Variable: RESID
Method: ARDL
Date: 01/24/19 Time: 15:14
Sample: 1988 2017
Included observations: 30
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.

RMSP(-1)	0.010207	0.077734	0.131311	0.9006
RGCF	0.008025	0.047092	0.170419	0.8714
RGCF(-1)	0.001829	0.038330	0.047708	0.9638
RGCF(-2)	-0.001573	0.066526	-0.023639	0.9821
RFDI	-0.000315	0.000688	-0.458467	0.6659
RFDI(-1)	-0.000255	0.000382	-0.668190	0.5336
RCAP	-0.008141	0.011604	-0.701566	0.5143
RCAP(-1)	0.013872	0.016620	0.834658	0.4420
RCAP(-2)	0.026985	0.014492	1.862028	0.1217
INTR	9.49E-05	0.000217	0.437711	0.6799
INTR(-1)	0.000106	0.000195	0.542846	0.6105
INTR(-2)	-3.95E-05	0.000186	-0.212883	0.8398
INFR	1.97E-05	9.62E-05	0.204916	0.8457
GEP	-4.67E-06	5.27E-05	-0.088630	0.9328
GEP(-1)	7.88E-06	9.92E-05	0.079469	0.9397
GEP(-2)	1.25E-05	4.60E-05	0.271963	0.7965
FDPC	-0.048709	0.047630	-1.022649	0.3534
FDPC(-1)	0.018255	0.033551	0.544080	0.6098
FDMS	-0.000358	0.000464	-0.771669	0.4752
EXCR	-9.86E-06	4.27E-05	-0.230894	0.8265
EXCR(-1)	9.59E-06	5.42E-05	0.177100	0.8664
EXCR(-2)	1.96E-05	6.19E-05	0.316363	0.7645
C	0.000255	0.012168	0.020936	0.9841
RESID(-1)	-1.413509	0.364629	-3.876565	0.0117
RESID(-2)	-1.042596	0.406701	-2.563544	0.0504

R-squared	0.757983	Mean dependent var	2.73E-17
Adjusted R-squared	-0.403701	S.D. dependent var	0.001348
S.E. of regression	0.001598	Akaike info criterion	-10.16576
Sum squared resid	1.28E-05	Schwarz criterion	-8.998093
Log likelihood	177.4864	Hannan-Quinn criter.	-9.792212
F-statistic	0.652486	Durbin-Watson stat	2.189300
Prob(F-statistic)	0.782819		

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	0.790004	Prob. F(22,7)	0.6883
Obs*R-squared	21.38642	Prob. Chi-Square(22)	0.4970
Scaled explained SS	1.453038	Prob. Chi-Square(22)	1.0000

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 01/24/19 Time: 15:15
Sample: 1988 2017
Included observations: 30

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.04E-05	2.17E-05	-0.480608	0.6455
RMSP(-1)	0.000112	0.000138	0.813323	0.4428
RGCF	-9.92E-07	7.96E-05	-0.012467	0.9904
RGCF(-1)	-9.60E-07	7.31E-05	-0.013132	0.9899

RGCF(-2)	2.38E-05	0.000113	0.211151	0.8388
RFDI	-5.39E-07	1.21E-06	-0.445975	0.6691
RFDI(-1)	-3.65E-07	6.75E-07	-0.541473	0.6050
RCAP	7.24E-06	2.20E-05	0.329810	0.7512
RCAP(-1)	3.14E-05	3.13E-05	1.002163	0.3496
RCAP(-2)	3.16E-05	2.43E-05	1.300947	0.2345
INTR	-1.03E-07	3.27E-07	-0.313341	0.7632
INTR(-1)	-6.69E-10	3.70E-07	-0.001810	0.9986
INTR(-2)	2.92E-07	3.33E-07	0.878161	0.4090
INFR	-1.15E-08	1.67E-07	-0.068669	0.9472
GEP	6.26E-09	9.36E-08	0.066916	0.9485
GEP(-1)	2.43E-08	1.61E-07	0.150724	0.8844
GEP(-2)	2.79E-08	7.62E-08	0.366447	0.7249
FDPC	-0.000132	8.60E-05	-1.537929	0.1680
FDPC(-1)	6.60E-05	5.83E-05	1.132336	0.2948
FDMS	-1.97E-07	8.77E-07	-0.224369	0.8289
EXCR	1.70E-08	7.71E-08	0.220647	0.8317
EXCR(-1)	-2.37E-08	1.01E-07	-0.235265	0.8207
EXCR(-2)	3.73E-08	1.09E-07	0.342412	0.7421

R-squared	0.712881	Mean dependent var	1.76E-06
Adjusted R-squared	-0.189495	S.D. dependent var	2.82E-06
S.E. of regression	3.08E-06	Akaike info criterion	-22.46514
Sum squared resid	6.64E-11	Schwarz criterion	-21.39088
Log likelihood	359.9770	Hannan-Quinn criter.	-22.12147
F-statistic	0.790004	Durbin-Watson stat	2.440268
Prob(F-statistic)	0.688262		

Ramsey RESET Test
Equation: UNTITLED
Specification: RMSP RMSP(-1) RGCF RGCF(-1) RGCF(-2) RFDI RFDI(-1) RCAP RCAP(-1) RCAP(-2) INTR INTR(-1) INTR(-2) INFR GEP GEP(-1) GEP(-2) FDPC FDPC(-1) FDMS EXCR EXCR(-1) EXCR(-2) C
Omitted Variables: Squares of fitted values

	Value	df	Probability
t-statistic	1.330999	6	0.2315
F-statistic	1.771559	(1, 6)	0.2315

F-test summary:

	Sum of Sq.	df	Mean Squares
Test SSR	1.20E-05	1	1.20E-05
Restricted SSR	5.27E-05	7	7.53E-06
Unrestricted SSR	4.07E-05	6	6.78E-06

Unrestricted Test Equation:
Dependent Variable: RMSP
Method: ARDL
Date: 01/24/19 Time: 15:15
Sample: 1988 2017
Included observations: 30
Maximum dependent lags: 1 (Automatic selection)
Model selection method: Akaike info criterion (AIC)
Dynamic regressors (2 lags, automatic):

Fixed regressors: C

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
RMSP(-1)	-0.533397	0.755413	-0.706099	0.5066
RGCF	0.175982	0.251383	0.700055	0.5101
RGCF(-1)	0.017708	0.085556	0.206972	0.8429
RGCF(-2)	0.375159	0.533777	0.702838	0.5085
RFDI	0.005036	0.007481	0.673238	0.5259
RFDI(-1)	0.004275	0.006086	0.702495	0.5087
RCAP	-0.012773	0.027460	-0.465143	0.6582
RCAP(-1)	0.039004	0.062230	0.626764	0.5539
RCAP(-2)	0.025195	0.052835	0.476862	0.6503
INTR	-0.000845	0.001270	-0.665242	0.5306
INTR(-1)	-0.000168	0.000400	-0.421462	0.6881
INTR(-2)	0.000970	0.001290	0.752218	0.4804
INFR	-0.000736	0.001079	-0.682371	0.5205
GEP	-0.000211	0.000343	-0.616969	0.5599
GEP(-1)	-0.000753	0.001130	-0.666292	0.5300
GEP(-2)	-0.000362	0.000548	-0.660075	0.5337
FDPC	-0.114269	0.205786	-0.555284	0.5988
FDPC(-1)	-0.177216	0.264335	-0.670423	0.5275
FDMS	-0.000460	0.001035	-0.443923	0.6727
EXCR	0.000158	0.000259	0.611069	0.5636
EXCR(-1)	0.000409	0.000603	0.678183	0.5229
EXCR(-2)	-0.000535	0.000790	-0.677779	0.5232
C	0.003792	0.050963	0.074408	0.9431
FITTED^2	12.84340	9.649438	1.330999	0.2315

R-squared	0.992736	Mean dependent var	0.077674
Adjusted R-squared	0.964889	S.D. dependent var	0.013901
S.E. of regression	0.002605	Akaike info criterion	-9.072390
Sum squared resid	4.07E-05	Schwarz criterion	-7.951432
Log likelihood	160.0859	Hannan-Quinn criter.	-8.713786
F-statistic	35.65004	Durbin-Watson stat	2.968065
Prob(F-statistic)	0.000117		

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