EFFECT OF DEPOSIT MONEY BANKS CREDIT SUPPLY FACTORS ON PRIVATE SECTOR CREDIT FINANCING IN NIGERIA

BY

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M.Sc./Banking & Finance/P14ADBA8424/2014-2016

A THESIS TO THE SCHOOL OF POSTGRADUATE STUDIES, AHMADU BELLO UNIVERSITY, ZARIA IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF MASTER OF SCIENCE DEGREE (M.Sc.) IN BANKING AND FINANCE

DEPARTMENT OF BUSINESS ADMINISTRATION,
FACULTY OF ADMINISTRATION,
AHMADU BELLO UNIVERSITY, ZARIA
NIGERIA

APRIL, 2017

Declaration

I declare that the work in this Dissertation entitled: “Effect of Deposit Money Banks Credit Supply Factors on Private Sector Credit Financing in Nigeria”has been carried out by me in the Departmentof Business Administration. The information derived from the literature has been duly acknowledged in the text and list of references provided. No part of this dissertation was previously presented for another degree or diploma at this or any other institution.

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_____ _____ _____

Name of Student SignatureDate

Certification Page

This dissertation entitled EFFECT OF DEPOSIT MONEY BANKS CREDIT SUPPLY FACTORS ON PRIVATE SECTOR CREDIT FINANCING IN NIGERIAby Festus Uroko, RAPHAEL meets the regulation governing the award of the degree of M.Sc. Banking and Finance of the Ahmadu Bello University, and is approved for its contribution to knowledge and literary presentation.

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Dedication

This work is dedicated to the glory of the almighty God who in His infinite mercy preserved and granted that amidst challenges and constraints I was able to complete this study in good health and in peace.

Acknowledgement

My first and foremost gratitude goes to the most supreme God almighty, and our loving saviour Jesus Christ for sparing my life till date to see the end of the M.Sc. journey I started two years back, and granting that I should be privilege to be among the finalist. My unalloyed praise be to the most benevolent God.

I am indeed indebted to all mortals who have extended help to me in the course of my studies and throughout the period of preparation of this research. I acknowledge that without their helps this dissertation would not have been completed. Although I cannot mention all of them by name the following people need special mention.

My wife, Mrs. Patience Odinaka Festus, and my mother, Mrs. Paulina Agene, for their understanding and forbearance to accommodate my absence; supporting me with their encouragement, continuous prayers, and being there when they are needed the most needed in my life. To my wife, I say your life is a model of virtue. God, bless you abundantly.

The Head of department, Dr.M.Y. Abubakarand theDean of the faculty,Ahmadu Bello University,Prof. Bello Sabo, for his fatherly role, counsel and support during the program to every member of my class. Without the Dean, earning an M.Sc degree in Ahmadu Bello University, Zaria today for me, in particular, would have been a mirage. I will forever live to remember the listening ears you gave me on my first day of meeting you in that citadel of knowledge, during my challenging moment. You were God-sent. May He remember you also for good in all your endeavours.

My two amiable program co-ordinators – past and incumbent, MalamYakasai, A.I, and Dr.MuhammedZubairu. Thanks for all the contributions you made to my being an M.Sc.Banking and Finance degree holder of ABU. To my Supervisors, in particular, Dr.Zubairu Mohammed and Dr.BadaraMuazu, I am short of words to acknowledge your invaluable inputs into my research work; also, your patience, encouragement and tolerance over my inadequacies during the period. I love you both. God, bless you.

My unreserved salutations go to Prof.SaniAbdullahi, Dr.IdrisAhmedand MalamMuhammed Ibrahim for their invaluable contribution to the dissertation. I learnt a lot from your contributions. I appreciate your time and the pains it took you to go through my work to make the best of it.

Mr. George Zangir, of Value Seeds Limited, Zaria, your financial support was instrumental for the success of my program. I want to say I am eternally grateful to God for you. God, reward you and your family abundantly.

Abstract

The study examined theEffect of Deposit Money Banks (DMBs) Specific Credit Supply Factors on Private Sector Credit Financing in Nigeria. The main objective of the study was to determine the long run effect of the DMBs Specific Credit Supply Factors on Private sector credit financing in Nigeria. The data used in the study was anannual secondary time series data for the period 1981 to 2015, obtained from the Central Bank of Nigeria (CBN) 2015 Statistical Bulletin. Private sector credit financing, proxied by private sector credit was the dependent variable while the independent variables, which include the two frequently used factors (deposit volume & Liquid assets) and the three rarely used factors (investment portfolio, public sector credit and foreign liability) by studies, constitute the proxies for DMBs Specific Credit Supply Factors. The methodologyused was econometric in nature: unit root test was conducted using Augmented Dickey Fuller (ADF), Co-integration test wasconducted using Johansencointegration test approach, and the long run test conducted utilising vector error correction method (VECM).The findings indicated that while DMBs specific credit supply factors, jointly, in the long run cause and exert significant impact on private sector credit financing inNigeria, only liquid assets and investment portfolio of the DMBs, individually,in the long run cause private sector credit financing in Nigeria; deposit volume, public sector credit and foreign liability didnot. The study, therefore, recommend that DMBs think long term by utilising greater percentage of deposits to meeting the investment needs of the private; reduce their level of credit to the government; and device some ingenious ways of generating more deposit for on-lending. Also, that government guarantees the loan to the private sector, where necessary, to reduce their risk perception by the DMBs; anddirect its relevantregulatory agency tosoftens its strict regulation on foreign liabilities so banks can take advantage of it to improve lending to the private sector.

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CHAPTER ONE

INTRODUCTION

1.1. Background to the Study

Finance remains crucial and indispensable to the investment and capital formation activities of the private sector - considered as the engine room of the economy (AfDB, 2011), particularly, in developing economies like Nigeria. Adequate finance,therefore,remains the life blood of the private sector without which working capital formation and private investment are stifled, emergence of new businessesis rendered impossible, existing businesses are deprived of the desired growth and expansion, and ultimately, economic development and progressbecomes unachievable. This is the reason why scholars such as Schumpeter (1911) and Levine (1997) are of the opinion that strong financial development or inclusiveness in an economy, that supports private sector initiatives, is a precursor for a strong and virile economic growth. There is alsoa strong consensus among studies that credit to the private sector is an important mechanism through which financial development matters for economic growth (Akinlo & Oni, 2015).

There are basically two broad finance sources opened to the private sector: internal and external. The inadequacies of internally (or self) generated funds to sustain the operation of the private sector necessitated the need for external sources of funding. Various external sources of fund are available to the private sector with the advent of financial system. These include stock or equity market. bond market, leasing companies, venture capital and money market such as banking institutions. The banks, deposit money banks (DMBs), in specific, however, remains the major source of funding to or financier of the

private sector in developing economyin Africafor several reasons among which are as rightly reported by the African Development Bank (AfDB) (2011):

> Most alternative external sources of finance to bank credit such as stock exchanges, bond markets, leasing companies, and venture capital providers, remain underdeveloped in Africa. Leasing finance, for instance, accounts for less than 2 % of gross fixed capital formation of most African countries and remains underdeveloped compared to other regions. Similarly, bond and stock markets rarely exist and when they do, they lack liquidity. These low penetration rates result from the poor level of financial sector development, dominance of banks in the financial sector and companies' lack of familiarity with these sources of funding.

DMBs in the performance of the intermediation role of mobilising funds, otherwise known as deposits, from the surplus unit of the economy and channelling such deposits into productive investments,championed by the private sector, remain dominant among financial institutions, in the provision of the much-needed external source of funds to the most active sector of the economy in Africa, Nigeria inclusive (Assefa 2014; Emmanuel,Abiola, and Anthony,2015; Marijana, 2009). These financial supports are often in form of loan advances and overdraft for a short, medium or long period which are capable of establishing a claim payable in the near future (Trading Economics, 2016).

Studies have shown that a strong and inclusive financial system, characterised by efficient provisioning of bank credit, has a positive and significant effects on output and employment opportunities (Emmanuel, *et al*, 2015).The critical role played by the private sector in an economy, cannot afford to be down played with lack of funds. The immeasurable achievement of the private sector at economic endeavourshas endeared and compelled the federal government of Nigeria, in recent past, to embark on some important reforms in the economy aimed at ensuring maximum involvement and participation of the private sector to drive asustainable growth in the economy. For instance, the privatisation and commercialisation Acts of 1988 and the Bureau of

Enterprise Acts of 1993, which objectives were aimed at full or partial relinquishing of erstwhile held government (or its agencies') equity or other interests in public assets to the private sector, had their sole aim at strengthening the role of the private sector in the economy to guarantee employment and capacity utilisation. Therewere also an attestation to, and recognition of, the private sector's capacity at efficient and effective resource utilization and high propensity to achieving desired economic goals.

Several other reforms embarked upon by the apex bank, targeted at banking financial institutions in Nigeria, DMBs in particular, to put them on solid footings and repositioning them to better perform their primarily role of financial intermediation, had its primary goal aimed at entrenching a sound and enduring financial foundation that is supportive and capable of leveraging the activities of the private sector.According to Sanusi (2012), the bank is the central nervous system of any market economy; the recapitalisation policy in 2008/2009 became necessary in order to implant a sound banking system that supports economic development. Justifying the objectives of the recapitalisation policy, Sanusi (2012) stated that:

> The real sector (represented by the private sector), which is the productive sector of the economy, relies heavily on the banking sector for credit. Government also raises funds through the banking system to finance its developmental programmes and strategic objectives. It is in view of these strategic roles of the banking system to national economic development that the issue of a sound banking system, through proactive reforms becomes imperative.

Available data on private sector credit financing by DMBs in Nigeria,however, has indicated that despite all the reformations in the banking sector to enhance private sector credit (PSC) financing, PSC funding by banks has remained inadequate relative to globally accepted index. According to Global economy report, as cited by Assefa (2014):

> a country is said to have a well-developed financial system, if itsbanking credit to the private sector (as percentage of GDP) accounts for 70% or above. In some very advancedeconomy it is even higher than 200%. However, in some poor countries, the amount of credit could be lowerthan 15% of GDP.

Figure 1.1.below shows the trend in private sector credit relative to GDP in Nigeria for the period 1981 to 2015 (extract from CBN 2015 Statistical bulletin).

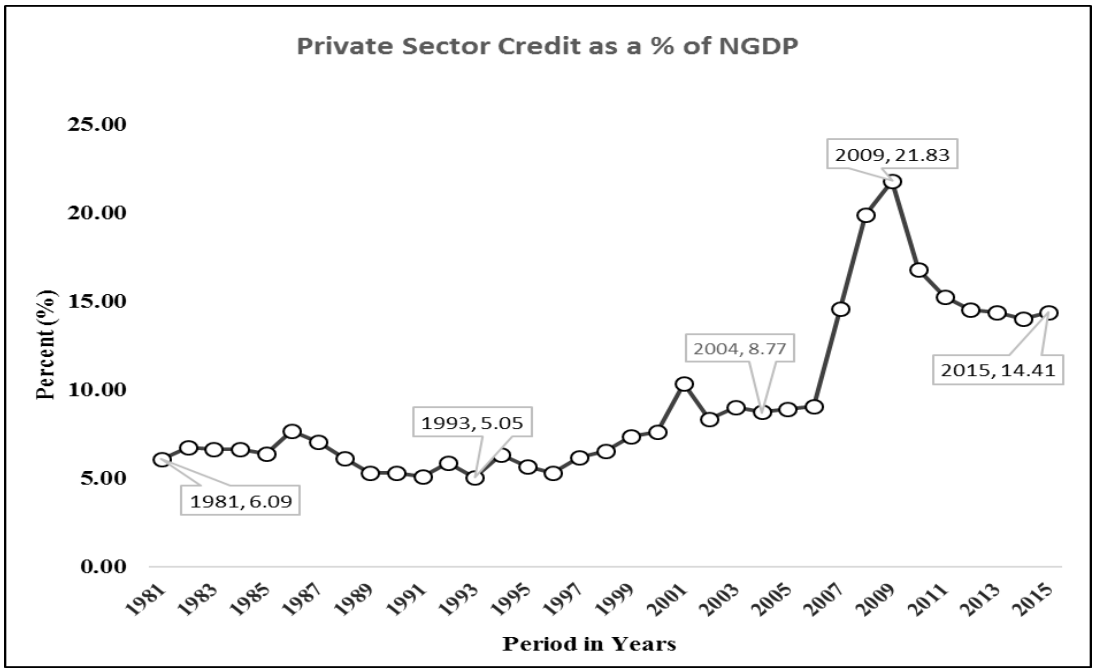


Figure 1.1. Total DMBs private Sector Credit (PSC) as percentage of GDP

Except for 2009, where private sector credit financing to GDP in Nigeria was 21.83%, it has always been lower than the 15% expectedfor poor countries as noted in the study by Assefa (2014).

According to Abuka andEgesa (2007) one of the main advantages of financial reform is the growth of credit expansion to private sector.Figure 1.2. below shows that deposit money banks credit to private sector initially had suffered sluggishness from 1981 until late 90s when some growth became noticeable. The year 2000 to 2015 witnessed a massive growth in aggregate private sector credit of about 2,467% (increase from N527.95 billion in 2000 to N13,568.88 billion in 2015). The growth was an aftermath effect of the different reformations carried out by the Nigerian apex bank, CBN, on the

banking sector in the period, in order to reposition them to better support the investment needs of the private sector.

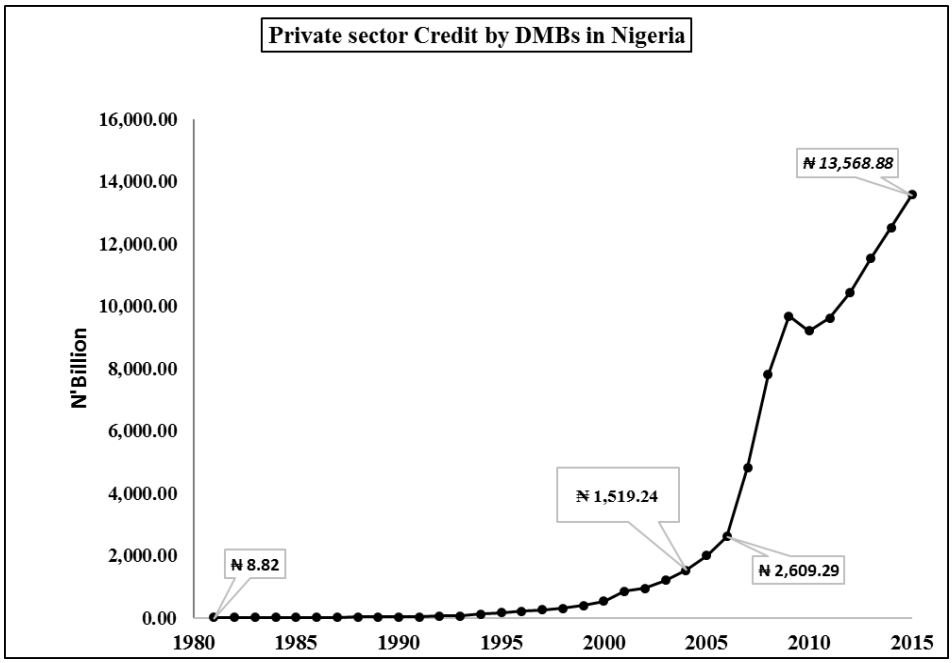


Figure 1.2. DMBs' total Private Sector Credit in Nigeria from 1981 to 2015

Despite this growth rate on aggregate, impact on economic growth has remained unnoticeable as private sector credit relative to gross domestic product (GDP) fluctuates between 7.65% in 2000 and 14.41% in 2015 with the highest rate of 21.83% recorded in 2009; immediately after the recapitalisation of banks in 2008.

The analysis above goes to show that for Nigeria to rub shoulders in terms of economic growth and development with notable economies in the world, a vibrant private sector credit financing enabling environment must be ensured and adequately maintained.Internal and external assessment of factors capable of constituting impediments to the ability of the DMBsin Nigeria to addressing the financial challenges of the private sector should be carried out, identified and addressed appropriately in order to unlock Nigeria's potential for a sustained and inclusive growth.

1.2. Statement of Research Problem

Finance, the life blood of any private investment has remained inadequate and at most times inaccessible to the private sector, not only in Nigeria but also in all other developing economies in Africa to be specific. “Access to finance remains problematic in Africa, particularly for micro, small and medium enterprises (MSMEs), which constitutesmost of Africa’s private sectorAfDB (2011

The problem of financial underservice to the productive unit, in an economy,has attracted the attentions of many scholars who with a view to finding a lasting solution have carried out several studies in this area of finance.Studies show that efforts of the DMBs to supplying the desired credits to the private sector are often impaired by factors which could be specific to the DMBs as institutions, and/or extraneous to the DMBs.Several DMBs specific factors have been identified by studies to influence the supply of credit to private sector by DMBs. These range from balance sheet to off-balance sheet factors. Among the balance sheet factors include volume of deposit, specifics of domestic and foreign investments, liquidity preference, level of foreign liabilities, level of capitalisation, claims on public sectors, non-performing loan, lending interest rate, and deposit rate, etc. (Akinlo & Oni, 2015; Assefa, 2014;Guo & Stepanyan, 2011; Olokoyo,2011; Kashif & Mohammed, 2013), while the off-balance sheet factors include location of the bank, ownership structure, sectoral preference, and years of operation in the industry (Haron, 2004).

The extraneous factors that studies have confirmed to be capable of influencing bank credit supply are classified into two, namely: microeconomic factors and monetary policy

factors. While macroeconomic factors are the factors that affect the general economy and over which no bank entity has control, such as economic growth rate, broad money supply, exchange rate, level of unemployment and rate of inflation, property prices(Hofmann, 2004; Mahmoud, 2014; Strike, 2015); factors such as the cash reserve ratio, window rate, CBN lending rate to banks, special directives on other banks operational matters (Jegede, 2014)constitute monetary policy - instruments with which the central bank regulate the banks.

Whereas the effects of some of these variables on bank credit supply have been established by previous scholars (Akinlo & Oni, 2015; Assefa, 2014; Guo & Stepanyan, 2011; Kashif & Mohammed, 2013; Samah & Ahmed,2014,Sharma & Gounder, 2012;Sogut, 2008; Strike, 2015), the studies are yet to examine the long run behaviour or effect of each of these variables on a specific segment of banks credit portfolio, such as the private sector credit.Understanding of the long run effects of the selected DMBs specific credit supply factors on private sector credit financing in Nigeria will foster the long run credit policy direction of the DMBs in Nigeria and ultimately the speed of growth in the economy.

Some banks specific credit supply factors such as liquidity rate (or liquid assets) and deposit volume, though considered in conjunction with extraneous factors in previous studies, have been found to be used frequent in almost all studies, both in Nigeria and abroad, and often found to have significant impact on bank credit supply (Imran & Nishatm, 2013;Olokoyo, 2011). Other banks specific credit factors such as foreign liabilities, public sector credits and investment portfolio have been rarely considered by studies in Nigeria, except investment portfolio which Olokoyo (2011); andOlusanya, Oyebo, and Ohadebere (2012)examined, alongside other bank credit supply factors, to

determine its effect on credit supply by DMBs in Nigeria and found to have a significantlynegative relationship.

Foreign liabilities had been found to have significant effect on credit supply in foreign studies conducted by Guo and Stepanyan (2011), and Kashif and Mohammed (2013) in two different countries. Globalisation has made it possible for DMBs to access funds beyond the shores of their operation in order to augment domestic funds mobilised to support their operation; although not without foreign exchange risks that must be guarded against.Studies on Public sector credits or claims on advances to the government by banks, have shown that it crowds out or negatively impacts private sector credit financing by banks, hence impedes appreciable investments by the private sector (Samah & Ahmed, 2014; Sogut, 2008; Yuga, 2016). AfDB (2011) also shared in this concern stating that governments saddled with chronic budget deficits borrow frequently and heavily,at an attractive returns and low risk level on local money markets, thereby reducing banks' appetite to lend to the private sector.

Thisresearch study is conducted to examine the combined and individual long run effect orcausality of the selected deposit money banks credit supply factors, comprising of the two most frequently used (i.e. deposit volume and liquid assets) and the three rarely used factors (investment portfolio, foreign liabilities, and public sector credit) by studies in Nigeria, on private sector credit financing in Nigeria.

1.3. Research Questions:

The basic questions the research study aims to answerare:

i. In the in the long run, does DMBs specific credit supply factors causePrivate Sector Creditfinancing in Nigeria?

ii. To what extent does Deposit Money Banks specific credit supply factors impact on Private Sector Credit in Nigeria?

Other specific questions are that: In the long run,

iii. CanDMBs Deposit volume cause Private sector credit financing in Nigeria?

iv. Does DMBs Liquid asset cause Private sector credit financing in Nigeria?

v. Does DMBs Public sector cause Private sector credit financing in Nigeria?

vi. CanDMBs Investment portfolio cause Private sector credit financing in Nigeria?

vii. Is DMBs Foreign liability able to cause Private sector credit financing in Nigeria?

1.4. Research Objectives

The broad objectives of the study will be to:

i. Examine whether in the long run DMBs specific credit supply factors causePrivate Sector Creditfinancing in Nigeria.

ii. Determine the extent to which Deposit Money Banksspecific credit supply factors impact on Private Sector Credit in Nigeria.

Other specific objectives will be to determine whether in the long run,

iii. DMBs Deposit volume cause Private sector credit financing in Nigeria.

iv. DMBs Liquid assets cause Private sector credit financing in Nigeria.

v. DMBs Public sector causes Private sector credit financing in Nigeria.

vi. DMBs Investment portfolio cause Private sector credit financing in Nigeria.

vii. DMBs Foreign Liability able to cause Private sector credit financing in Nigeria.

1.5. Research Hypothesis:

The following null hypotheses were tested to achieve the broad objectives of the study.

H_{01}: In thelong run, Deposit Money Banks specific credit supply factors do not causePrivateSector Credit financing in Nigeria.

H_{02}: Deposit Money Banksspecific credit supply factors have no statistically significant impacton PrivateSector Creditfinancing in Nigeria.

Other specific hypothesis will be that: In the long run,

H_{03}: DMBs Deposit volume does not cause Private sector credit financing in Nigeria.

H_{04}: DMBs Liquid asset does not cause Private sector credit financing in Nigeria.

H_{05}: DMBs Public sector does not cause Private sector credit financing in Nigeria.

H_{06}: DMBs Investment portfolio does not cause Private sector credit financing in Nigeria.

H_{07}: DMBs Foreign Liability is not able to cause Private sector credit financing in Nigeria.

1.6. Scope of the Study

In general, bank credit study can be viewed from two perspectives namely: the demand side (*i.e*. factors influencing firms or individual's demand for credit) and the supply side (*i.e.*factors influencing banks' credit supply). This study is has examined the supply side factors.The study instead of looking at the aggregate deposit money banks credit supply has limited itself to only a segment of it (i.e. private sector credit financing).

Of the numerous deposit money banks credit supply factors, only the specific factors, categorised into the twomost frequently used, and the three rarelyused by studies are

adopted by this study. Only few studies could have examined their combined effect on private sector credit financing mostly in the short run.

The period 1981 to 2015 was chosen as it witnessed the greater number of banks reformations and transformations in the history of banking business in Nigeria. It is also the era in which private sector empowerment was pursued by the government of Nigeria.

1.7. Significance of the study

Understanding of the degree of long run association between, and nature of causality arising from the Deposit Money Banks specific credit supply factors to the Private Sector Credit will keep the deposit money banks better informed to come up with relevant strategies to better manage those peculiarfactors profitably for betterment of the private sector who are the backbone of any economy.

Knowing the significance of the foreign liability effect on private sector credit in Nigeria will provide an important input to the monetary authority in Nigeria to better regulate foreign funding of bank activities in the country in view of the foreign exchange risk exposure associated with this source of funding and not jeopardising the advantage it could bring too.

Understanding of the nature of effect (crowd in or crowd out) of central government borrowing from the DMBs on private sector credit financing will help to better advice the central government on the best alternative mode of financing her operation instead of relying on domestic DMBs .

CHAPTER TWO

LITERATURE REVIEW

2.1. Introduction

This chapter reviewed the various literatures relevant for the study. It attempts to highlight the literature into conceptual, empirical and theoretical.

2.2 Concept of Private Sector Credit Financing.

Banks do grant loans and advances to individuals, business organizations as well as governments in order to enable them embark on investment and development activities as a mean of aiding their growthin particular or contributing toward the economic development of a country in general(Olokoyo, 2011). Credits granted by the banks can be broadly grouped, institutionally, into two categories, namely public sector credits (government borrowings from banks)and private sector credit. According to the world bank, private sector credit (PSCR)is a form of domestic credit to private individuals and institutions for economic activities. It is financial resources provided to the private sectorby banks or other financial institutions to the private sector of the economy inform of loans, purchases of non-equity securities, and trade credits; and other accounts receivables that establishes a claim for repayment (Trading Economics, 2016) in the future.

Private sector credit financing by banks constitutes a major external fund source available to the private sector with which they lubricate their activities that enhance economic development and growth considering the fact that internally generated funds, to many of them, have been found to be grossly inadequate for their operation which is often capital intensive.

Several studies conducted have indicated a strong positive associationship between private sector credit financing and economic growth (Akpansung & Babalola, 2012; Emecheta & Ibe, 2014; Oluitan, 2012). This is why any development-oriented government will leave no stone unturned in ensuring that the banking institutions are well positioned to adequately finance the credit needs of the private sector in the economy in order to maximally harness the full potential of the sector.

Private sector credit financing in Nigeria, base on available data, has been on the ascendancy on aggregate (figure 1.1.) but annual comparative analysis (figure 2.1.) provedinconsistency in commitment by the deposit money banks in Nigeria.For instance, 1986 recorded a growth of

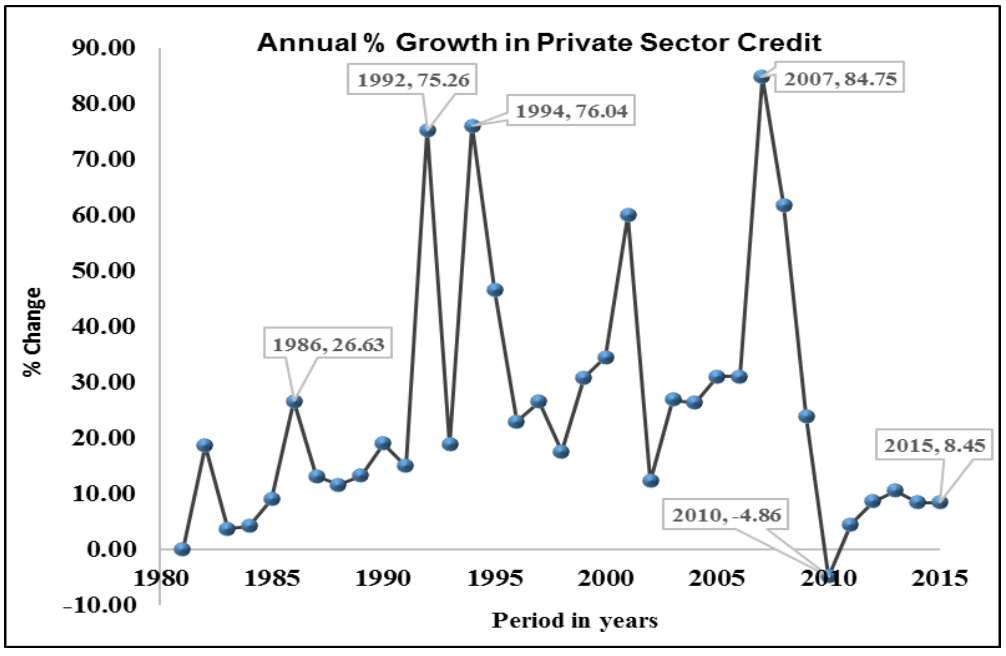


Figure 2.1. Annual percentage growth in Private sector credit financing in Nigeria by DMBs

26.63% from 1985 but could not be sustained for the next five years as it dropped. 1992, 1994 and 2007 were other years that witnessed growth in private sector credit financing relative to previous periods but none could be maintained as immediate subsequent years all recorded drammatic decline.The fall from the annual growth of 84.75% in 2007 to a negligible 8.45% in 2015 further attest to the weak will power of the DMBs to the development of these important segment of the economy. It is no surprise that this lack of commitments by the banks to private sector financing in Nigeria have translated into an all time low average private sector credit to GDP ratio of 9.31%; less thanthe 15% recommended for a low financial developed country. Until this trend in private sector credit financing is changed and meaningful priority is accorded it, economic growth and development may remain a far cry from the Nigerian economy.

2.3 Concepts of Deposit Money BanksCredit Supply Factors

The interplay of variables within and outside the deposit money banks operating environment determine to a large extent the capabilities of the banks atfinancing the credit needs of the private sector. This study is focusing on how specific factors of the banks influence private sector credit financing. By banks specific factors we are referring to those factors that are non-external to the banks and within management control. These factors could be further classified as non-financial statement factors (*e.g.* number of branches, ownership structure, Status-ltd or Plc, location, and years of operation) and financial statement factors (profitability, deposit rate/volume, liquidity, investment, capital base, non-performing loan value, *etc*.) (Haron 2004).Our study will focuse on those factors that are within the confine and control of the banks and purely balance sheet base. Described below are some of the bank- specific factors (frequently and seldom used by studies) identified and considered relevant for this study:

2.3.1. Liquid Assets(LQA):It is not uncommon to find liquid assets or liquidity ratio being used by studies as one of the explanatory variables. Liquid assets of the banks are the cash convertibles assets that aids the ability of the DMBs to meet and discharge all short-term obligations of the banks as they fall due. The liquid assets comprise the sum value of cash and cash equivalents balances, marketable instruments and reserves with CBN. Any asset of the banks that are easily realised for cash and at less cost of transaction can be regarded as liquid assets. The size of the liquid assets held or willing to be held by the bank is one of the factors capable of affecting the willingness and capability of DMBs tofinancing the private sector credit request because abank preference for a high liquid asset ratio retention will imply a low the proportionate loanable funds that can be made available.

2.3.2. Deposits Volume (DPV):This is anotherfrequently (if not the most frequently) used banks specific factor in studies. It is the amount of funds mobilised locally by banks in form of savings from the surplus unit of the economy and ready for loaning to the investible but needing segment of the economy. The amount of deposit the DMBs are able to generate can go a long way to determine how much could be made available for financing the Private Sector credit needs. Total deposit is retained in the DMBs as time, savings, or demanddeposit and represents liabilities to private individuals, institutions, government, domestic or foreign. The amount of funds a bank is capable of generating cis expected to have a positive bearing on how much financing assistance it could lend to the private sector. That is, all things being equal, the higher the volume of deposit the more the banks should haveand be willing to lend.

2.3.3.Investment Portfolio(IVP):This comprise of all long-term assets, other than fixed assets, into which funds has been committed by the DMBs, such as purchase of subsidiaries and related companies. It is one of the rarely used bank specific factors in studies of this nature. The deposits and other liabilities of the bank have alternative uses. A commitment to building investment assets, whether short term or long term by a bank will invariably, all things being equal, leave less financial resources to meeting private investment credit needs. The more or less preference a bank places on the investment of its funds on other assets other than to meet the credit demands of the investing public, the less or more funds that will be made available to finance credit facility.

2.3.4. Public Sector Credit (PuCr):This is also a rarely adopted banks specific factor in studies. This is otherwise known as claims against the public sector or government by the banks. It represents all domestic funding of government deficit budgets by the banks. The banks find it easy to lend to the public sector because of its characteristics high return and low risk nature in comparison to its private sector counterpart. Public sector credit is known to either crowd-out or crowd in private sector credit. Sogut (2008) explained that increase in government application for credit will force the banks to increase real lending rate, given that the bank supply of credit is constant and profit maximization as the banks objectives, thereby leaving the private sector with no choice but make do with what he can afford and in which case retards the scope of its investment. Increase in public sector credit is expected to lead to reduction in private sector credit and *vice-versa,* all things being equal.The total indebtedness of government to the DMBs in the period is used to proxy for this variable in the study.

2.3.5. Foreign Liabilities (FRL)**:** Yet another rarely employed banks specific factor in studies- This is the total indebtedness of a local bank to another foreign bank or

institution. It consists of loan and advances from foreign bank, placements of foreign balances with the local bank, and foreign currency deposits (CBN Statistical bulletin, 2015). For purpose of studies, it is often expressed as a proportion of total assets base or capitalisation. It is expected, like deposits, to have a positive impact on the proportional of credit the private sector. *i.e.* increase in foreign liability ratio should, all thing being equal, increase amount of loanable funds to the private sector.

2.4 Review of Related Empirical Studies

Several studies have been conducted in the past on the subject of the effects of bank variables (credit determinants) – external and internal- on bank credit, across countries, foreign national boundaries, and within Nigeria,From the previous studies, it is clear that the credit performance of bank and bank credit determinants vastly differs across boundaries as shown by the mixed evidences from previous studies about these factors. This confirms the wisdom that "one size doesn't fit all". Local conditions of each country or a group of countries may lead to different outcomes regarding the determinants of the performance of the banking sectorcredit (Mahmoud, 2014).

2.4.1 A cross country study of Bank Credit Factorsand influence on credit supply

Sharma and Gounder (2012) examined the change in the bank credit provided to the private sector in six economies in the South Pacific during the period 1982-2009. The study used the credit granted to the private sector as a dependent variable, while the independent variables included the average interest rate on the loans, the rate of inflation, the ratio of deposits to the GDP, the size of the banks' assets of output, a dummy variable reflecting the existence of a financial market, and the GDP. The results showed that the higher average interest rates on loans and the higher inflation rate might have negative effects on the rate of growth in credits, while the size of the deposits and assets had a

positive impact on the growth of credit. The results also indicated that the strong economic growth leads to higher growth in credit.

Another study, looking at changes over time in bank credit across a spectrum of emerging economies, conducted by Guo and Stepanyan (2011), using credit granted to the private sector as the dependent variable with the independent variables being the foreign liabilities of banks, the volume of domestic deposits, the rate of inflation, the real GDP, the interest rate on deposits, the exchange rate, non-performing debt, and the money supply, had its results indicating that the domestic and foreign financing contributed positively to the growth of credit provided by banks. The study also found that the strong economic growth leads to an increase in credit growth and inflation rates, and that the expansionary monetary policies locally and globally lead to an increase in the volume of credit and thus strengthening the banking sector.

In another study conducted by Sogut (2008) to investigate the determinants of financial development and private sector credits for a panel of 85 developing and industrial countries using annual data from 1980 to 2006, the results from the panel cross-sectional fixed effects procedure suggested that an increase in the public-sector credits and central government debt leads to a decrease in private sector credits in low income and lower middle income counties. For this group of countries, public sector credits, however, leading to a financial crowding out, are found to be enhancing financial development. For the upper middle income and high income countries, private sector credits are found to increase with public sector credits and financial development and decrease with central government debt. Financial development is affected adversely from inflation and positively from real GDP and public sector credits in high income countries. In upper middle income countries both real GDP and credits to public sector affect financial

development positively. In low income countries, on the other hand, public sector credits and inflation are correlated positively with financial development.

According to Aisen and Franken (2010) prior to financial crisis, the bank credit growth was larger as compared to post crisis period. Using a sample over eighty countries they concluded that the countercyclical monetary policy and liquidity position of the banks played a crucial role and lessened the bank credit reduction in the post crisis era. These findings advocate that the countries should follow the appropriate institutional and macroeconomic structure favourable to countercyclical monetary policies.

Hofmann (2004) analysed the patterns of dynamic interaction between bank lending and property prices based on a sample of 20 countries using both time series and panel data techniques. Long-run causality appears to go from property prices to bank lending. The finding suggested that property price cycles, reflecting changing beliefs about future economic prospects, drive credit cycles, rather than excessive bank lending being the cause of property price bubbles. There is also evidence of short-run causality going in both directions, implying that a mutually reinforcing element in past boom-bust cycles in credit and property markets cannot be ruled out.

Mahmoud (2014) examined the macroeconomic determinants, such as economic growth, financial liberalization, trade openness, economic globalization and monetary policies, of the development of the banking sector in Egypt and Saudi Arabia. The study used cointegration analysis to find out the long-run equilibrium relationship among the variables of the model. The following results were generated: while economic growth had a long-run negative impact on private sector credit, financial liberalization and real interest rate recorded a significant positive effect on credit to the private sector in both

Egypt and Saudi Arabia; economic globalization, however, seems to have just a significant positive effect on private credit in Saudi Arabia only; trade openness had a positively significant effect on the credit to the private sector in Egypt only whereas the growth rate of money supply exerts a positive and significant effect on the development of the banking sector in Saudi Arabia. This study reveals some implications for policy makers regarding the importance of liberalization policies and the need for further reforms in domestic banks to adapt with the requirements of globalization and global competition.

Constant and Augustin (2012), utilising a regression analysis, analysed the determinants of bank long-term lending behaviour in the central African economic and monetary community using data from 35 commercial banks of six African countries of the CEMAC, over the period 2001-2010. Two dependant variables: a). the ratio of bank long-term business loans to total assets and b). the ratio of bank business loans to total assets, were regressed on independent variables- bank size, capital to asset ratio, long term liabilities, NPL, ownership type, inflation and GDP growth. According to the regression results, bank size, GDP growth and capital-to assets ratio were positive and statistically significant in both analyses. In the researchers' opinion that means that larger and well capitalized banks are more willing to grant business loans. The relationship between NPL and the long-term loans to assets ratio is positive while there is no relationship between inflation rate and long-term loans ratio.

Strike (2015) also conducted a study in southern Africa using annual panel data spanning 1996-2010 for eleven South African Development Community (SADC) countries to establish the determinants of credit to private sector; the possibility of a crowding out effect of government debt and the contribution made by institutional quality. The study

used both the fixed effects and dynamic model based on GMM estimations. There was strong evidence suggesting that financial development, economic growth, trade openness and domestic credit by banks were important in explaining growth in credit to the private sector. Government debt was insignificant while institutional factors played a complementary role. He stated that extension of financial resources to the private sector is enhanced by keeping low specifics of corruption, improving government effectiveness as well as the regulation quality. Reduction in the risk profile for investments allows banks to release more financial resources to the private sector. Monetary policy initiatives like favourable credit rationing policies play a key role in developing financial markets.

Hofmann (2004) investigated the relation between credit to private non-bank sector and economic activity, real interest rates and property prices in 16 industrialized countries between 1980 and 1998 by using quarterly data. In the study, it is stated that, during the period, there has been boom and bust cycles in the credit markets in the industrialized countries often coinciding with movements in the economic activity and property markets. Hofmann (2004) points out that economic activity, interest rate and property prices affect the credit via both supply and demand channels. Accordingly, Hofmann shows that the long run development of credit cannot be explained by standard credit demand factors such as real GDP and the real interest rate alone and real property prices should also be included. The results by Hofmann (2004) suggest that there is a long runrelationship between real credit and real GDP, real property prices and real interest rate; real property prices affect real credit positively in the long run while real credit is linked negatively to the real interest rate. Hofmann (2004) argues that a rise in real GDP affects lending and property prices positively and increases in credit together with property prices promote output growth. It is also shown that there is significant two-way relationship between credit and property prices. In addition to these, the study finds that

innovations to the real interest rate have significantly negative effects on real lending, real GDP and real property prices.

Almost all the cross-border studies examined the relationship between bank credit determinants and private sector credit. However, virtually all the factors investigated are macroeconomic in nature with only few studies considering few banks specific factors. Macroeconomic factors alone cannot fully explain the challenge of credit supply to the private sector within the realm of the banks. Examination of how far banks fared within their own capacity, barring external or uncontrollable factor, with provision of private sector credit will be an important information to enhance credit flow to the private sector.

2.4.2 Country-Specific Studies of Bank Credit Factors and Influence on Credit Supply.

Mwafag (2015), examined the determinants of commercial banks' lending in Jordan. The study sampled ten Jordanian commercial banks during the period 2005-2013. The study used the ratio of credit facilities to total assets as a dependent variable, and eleven independent variables including the ratio of deposits, ratio of non-performing loans, capital ratio, liquidity ratio, asset size, average lending rate, deposits rate, window rate, legal reserve ratio, inflation and economic growth rate. The results showed that the ratio of non-performing loans, liquidity ratio and window rate have a negative and significant impact on the ratio of credit facilities, while it found that the bank size and the economic growth have a positive and significant impact on the ratio of credit facilities granted by commercial banks in Jordan. The study recommended Jordanian commercial banks to avoid excess liquidity, and to pay more attention to reduce the ratio of non-performing loans.

In Russia, Chernykh and Theodossiou (2011)also carried out studies on a sample of Russian banks. It was discovered that average number of those banks granted only 50% of their total assets in the form of long-term loans to the business sector, with a significant difference in the ratio of one bank to another. The study further observed that the bank's abilityto significantly enhance commercial loans was contingent on factorssuch as capital, volume and availability of long-term liabilities, while the ownership of the bank had no effect on the size of loans. Also, the study reported that the banks which had a low specific of capital provided less long-term loans, and the banks that operated in areas with a high competitiveness hesitated in granting long-term loans.

Kashif and Mohammed (2013***)*** investigated the determinants of the bank credit by using time series data from 1971 to 2010 in Pakistan. The dependent variable was Private credit and the independent variables were:Foreign Liabilities, Domestic Deposit, Consumer Price Index, Real Gross Domestic Product, Exchange Rate, Money Market Rate, and broad money supply (M2) as percentage of GDP. The empirical results indicated that the foreign liabilities, domestic deposits, economic growth, exchange rate, and the monetary conditions all had significant impact on banks credit to the private sector in Pakistan, particularly in the long run. Whereas the inflation and money market rate did not affect the private credit.

Maja (2015) observed that in Montenegro, before a major financial crisis, credit growth was rapid, and at the same period coincided with the privatization of several banks and the entry of foreign banking groups. These periods experienced massive banks' lending process and increasing competition in the sector. Maja (2015) conducted a study trying toidentifyand estimatedeterminants of credit growth in Montenegro, exploring both demand and supply side factors, but paying particular attention to the supply factors. The

study findings confirmed that positive economic developments and an increase in banks' deposit potential lead to higher credit growth. Furthermore, the findings emphasized that the bankingsystem soundness is decisive for promoting further bank`s lending activities. The study provided evidence that the weakening of banks` balance sheets, in terms of high non-performing loans and low solvency ratio, has a negative effect on credit supply.

Grodzicki, et al. (2010) examined the necessary conditions for the existence of a channel to carry the risks of the monetary policy in the Polish banking sector by testing whether the lending policies of each bank had an impact on the money supply of loans. The study relied on the survey data of the Polish bank lending with tuning the factors related to the demand side. Also, the study found that the individual bank lending policies constitute an important driver for the growth of credit; however, the financial constraints- capital and liquidity factors- were less important in determining the growth of credit.

A related study was conducted by Sarah (2014) in Kenya to examine the effect of macroeconomic variables on private sector credit using annual time series data for the period 1980-2012, with her data sourced from Kenya National Bureau of Statistics, World Development Indicators and Central Bank of kenya. The study used OLS method. The findings were as follows; public investment, short term interest rate, long term interest rate, employment and domestic debt have a positive effect on demand for credit by the private sector, whereas per capita GDP and exchange rate have a negative effect on demand for credit by the private sector.

Assefa (2014) conducted an empirical examination of factors determining bank credit to private sector in Ethiopia. The study focused on determining the short and long-run impact of bank-specific, monetary policy and macroeconomic variables on bank credit to

private sector, spanning a period of 1978 to 2011 and adopting acredit supply-side approach. TheAutoregressive Distributed Lag (ARDL) econometric model using annual time-series data was employed. The study used bank credit to the private sector as dependent variable while domestic deposit, foreign liabilities, lending interest rate, reserve requirement, M2 as percentage of NGDP, Real Gross Domestic Product(RGDP) and inflation were the major explanatory variables. The finding indicated that domestic deposits, foreign liabilities, real lending interest rate,M2 as percentage of NGDP, GDP and inflation have significant impact on banks credit to the private sector in the long-run. Whereas reserve requirement did not affect commercial banks credit to private sector both in long and short-run. In the short-run domestic deposit and economic growth had no influence on commercial banks credit to private sector. The coefficient of ECMt-1 (-0.757) shows a rapid adjustment process and dictates that the disequilibrium of the previous period shocks is adjusted in to long-run equilibrium in the current period. The long and short-run results providedno strong support of the influence of banking sector reform on the growth of bank credit to private sector as shown by the coefficient for the dummy variables in Ethiopia. Finally,the results recommend that efforts should be geared towards keeping the inflation rate low and stable.

Ewert, Schenk, and Szczesny (2000) empirically identified factors that could explain the financial performance of bank lending activities in Germany. They also analysed the individual bank's evaluation of a loan's risk. They used their results to test theoretical hypotheses on the impact of certain parameters on credit terms and distress probabilities. They findings showed that ratings act as an important factor in the bank's lending policy. Ratings reflecting higher risks lead to higher interest rate premia.

Qais and Kaddumi (2015), carried out a study on the cyclicality of lending behaviour by banking sector in Jordan, using panel data and applied multi regression analysis on thirteen (13) Jordanian conventional banks and two Islamic banks for the period 2000-2013.The study found that lending behaviourwas significantly affected by internal factors (Deposit Volume, Interest Rate and net profit after tax) and significantly by external factor (Reserve Ratio, GDP, Inflation Rate, overnight window deposit rate (OWDR))and Red. R- proxied for monetary policy). The analysisindicated that OWDR and Red. R as a did have a negative impact on lending behaviour but not significantly proven. The study also reached to a conclusion that the amount of loans and advances extended by Jordanian banks is not affected by rate of interest. It was therefore recommended that Jordanian banks' management take into consideration internal specific factors as well as external specific factor with more care while formulating their lending policy, moreover central bank in cooperation with the Jordanian banking sector should work in more productive relationship in order to enhance more the economic growth.

Yuga (2016) empirically investigated the determinants of commercial banks' lending behaviour in the Nepalese context. The pooled data of 4 commercial banks for the period 2007 to 2014 was analysed using regression model. The dependent variable used in the study was loan advance (LOA) and the independent variables used were: bank size, liquidity, investment portfolio, cash reserve ratio and deposit to capital ratio. The regression results revealed that bank size had significant positive effect on loans and advances whereas liquidity ratio, investment portfolio and cash reserve ratio had significant negative effect on banks' loan advances (LOA). The study then concluded that the major determinants of commercial banks' lending behaviour in Nepal are: bank size, liquidity, investment portfolio, and cash reserve ratio.

Ali (2015)analysed the influence of some macroeconomic and banking factors on credit growth for a period of 2002-2013, using quarterly panel data for the whole Albanian banking system with a total of 48 observations per each variable and utilising ordinary least squares (OLS) regression model to find the relationship between credit growth and macroeconomic and banking factors. Credit growth was the dependent variable while independent variables were: GDP growth, inflation rate, unemployment rate, loan interest rate, capital adequacy ratio, bank size and NPL ratio. The regression results findings revealed that the credit growth in the Albanian banking system is positively related to GDP growth, inflation rate and capital adequacy ratio while it is negatively related to unemployment rate, interest rate, non-performing loans and bank size.

The studies conducted within specific countries above, examining the performance of banks internal and external factors on the funds made available by banks as credit, had all, exceptfew, not specific on private sector credit; even at that, the few that were specific dwelt more on the influence of multi-variable factors on bank credits. None examine the banks specific factors and private sector credit as a stand-alone study. Or are we saying these two variables cannot relate without external factors? If they do, how significant, and to what extent without external influence? The rarity of studies examining the interaction between bank specific factors and private sector credit is not only an observable phenomenon in foreign studies alone but also among studies in Nigeria.

2.4.3 Local Studies on Bank Credit Factors and Influence on Credit Supply

In a "Determinants of lending behaviour of commercial banks in Nigeria: a Co-integration analysis between 1975 to 2010" study undertook by Olusanya, Oluwatosin and Chukwuemeka (2012),using secondary data, and series of Econometrics techniques

to justify the long run relationship between Commercial bank and its lending behaviour over the period of analysis, the result revealed that there was a positive relationship between the dependent variable- Loan and advances, and the independent variables - Volume of deposits, annual average exchange rate of the naira to dollar, Gross domestic product at current market price and cash reserve requirement ratio except Investment portfolio and Interest rate (lending rate) that had a negative relationship. It was also revealed from the result that there was a long run relationship between Loan and advances and all the explanatory variables in the model and this showed that commercial banks variables have a lot of impact on their lending behaviour.

Olokoyo (2011) discussed the determinants of bank lending for the commercial banks during the period 1980-2005, and their effectiveness in influencing the behaviour of bank lending. The study sample included loans and advances granted by the Nigerian banks as a dependent variable, while the independent variables included the size of the deposit, the size of the investment portfolio, the interest rate on the loans, the reserve requirement ratio and the liquidity ratio. Through using the regression analysis, the results showed the statistical significance of the study model and the independent variables were as expected. The study results indicated that the deposits of the commercial banks have the biggest impact on the behaviour of lending by the Nigerian banks. Also, the study suggested the need that the commercial banks attract more deposits because this will improve the performance of bank lending

An empirical study conducted also by Jegede (2014) to examine the effect of monetary policy on commercial bank lending in Nigeria between 1988 and 2008, used macroeconomic time series variables of exchange rate,interest rate, liquidity ratio, money supply, and commercial bank loan and Advances. The Vector Error Correction Model

(VECM) was employed as the estimation technique. The findings indicated that there exists a long run relationship among thevariables in the model. Specifically, the findings revealed that exchange rate and interestsignificantly influenced commercial banks' lending, while liquidity ratio and money supply exertnegative effect on commercial banks' loan and advances.

In another Nigerian study conducted by Akinlo and Oni (2015), the dominant factors influencing bank credit to private sector in Nigeria was investigated covering a period 1980-2010 and using the error correction modelling technique as the econometric estimation model. With the Private Sector credit used as the dependent variable, variables: broad money supply (M2), liquidity ratio, bank totalasset (a proxy for bank size/capitalization), Inflation rate (INF), reserve ratio, cyclical risk premium, prime lending rate, exchange rate, minimum rediscount ratio, real gross domestic product constituted the explanatory variables.The results showed that broad money, cyclical risk premium and liquidity ratio tend to increase credit to the private sector. However, prime lending rate and reserve ratio led to a reduction in credit to the private sector. Private credit increases with inflation, but not one to one, meaning that inflation tends to dampen real bank credit to the private sector.

Aigheyisi (2015) examined the determinants of loans and advances extended by microfinance banks in Nigeria using data spanning the period from 1992 to 2013. The empirical evidence indicates that the major determinants of the amount of loans and advances extended by MFBs are deposits, shareholders' fund, liquidity ratio and inflation. The study noted that customers' deposits positively affect MFBs' loans and advances in the short-run and long-run, though the long run effect is not significant. Shareholders' fund also positively affects MFBs' loans and advances in the short-run and

long-run. Inflation and liquidity ratio negatively affect the amount of loans and advances extended by the MFBs.

Usman (1999) has pointed out the factors that affect commercial banks' lending behavior in Nigeria. The author asserted that the sound and viable functioning of commercial banks in Nigeria is adversely affected by the choice of certain policy instruments for the regulation of banking operations. Such instruments include a rigidly administered interest rate structure, directed credit, unremunerated reserve requirements and stabilizing liquidity control measures like the stabilization securities of the past.

Yupeng, Anand, and Takesh (2014), investigated the effect of direct lending by government owned banks on real investment for publicly traded industrial firms in Japan, focusing on a period during the financial crisis in the 1990s caused by the burst of the real estate bubble. Findings showed that increases in government owned bank lending have a strong impact on investment, particularly as they step up their lending to credit constrained firms during the crisis. Government owned bank lending not only increased the specific of real investment but also amplifies the investment sensitivity to Tobin's q and reduced that to cash flows. The impact of government owned bank lending on real investment were much larger than those of private bank lending, while the latter is strongly associated with the increase in firms' cash holdings. Thus, our results show that direct interventions by government owned banks can be effective in mitigating credit constraints and stimulating investment even for publicly traded companies.

2.5 Theories Underpinning the Study

2.5.1 Harrod-Domar Growth Theory

Thispure development economy theory by Sir Roy Harrod in 1939 and Evsey Domar in 1946 submitted that economic growth in any economy is a function of the level of savings and the capital output ratio of such economy. They argued that increase in the level of saving increases the available pull of funds for investing public, all things being equal. When investment rate soars, the capital stock of an economy increases leading to the production of goods and services which also in turn improves the living standard of the people. The theory further suggested that an economy should also work towards a minimal capital output ratio. The lower this ratio index, the more productive an economy is believed to be. In other words, an economy should aim at a higher output per unit of capital investment if sustainable economic growth must be realised.

Encouragement of technological advancement by the government and all facilitating institutions may be the only sure way to achieving a low capital output ratio. This is why the private sector, who have been known to be the major force pioneering various innovation, deserve themuch-needed financial attention to continue the good work of growing the economy in Nigeria.

2.5.2. Theory of financial Intermediation

Theoretical studies have established the relationship that exists between effective financial intermediation and economic growthbrought about by a functioning and empowered private sector. For instance, Schumpeter (1934), Goldsmith (1969), Mckinnon (1973), and Shaw (1973), in their studies, strongly emphasized the role of financial intermediation in economic growth. In the same vein, Greenwood and Jovanovic (1990), observed that financial development can lead to rapid growth. Nnanna, (2004) also submitted that credit is an important aspect of financial intermediation that provides funds to those economic entities that can put them to the most productive use". In a related study, Greenwood and Smith (1996) explained that development of banks and

efficient financial intermediation contributes to economic growth by channelling savings to high productive activities (undertaking by the private sector) and reduction of liquidity risks. They therefore concluded that financial intermediation leads to growth. Effective financial intermediation can only be achieved when all variables fundamental to the operations of the deposit money banks are identified and managed judiciously to effectively service the private sector, the economic engine room.

2.6 Summary of Section

On the whole effective intermediation is a necessary pre-requisite for the development of a sound and strong footed economy. Banks, as the facilitator, are indispensable and hence should be fortified within by effective and enduring policies and necessary regulatory backings to efficiently and productively carry out their intermediation role. The private sector as the main agent of economic transformation, relying more on bank credit, should not be starved of needed fund in order not to discourage their good works.

The empirical tour of studies carried out above on the subject touching bank credit determinants and credit performance, comprise of cross-country studies, specific foreign country studies and domestic studies conducted in Nigeria on the topic. Most of the Cross-country studies examined the relationship between, particularly, private sector and macroeconomic cum banks specific factors. The country-specific foreign studies mostly examined the influence of external and internal bank credit determinants on general bank credit. A clinical x-ray of the studies within Nigeria shows that most of the local studies tilted in the direction of the country-specific studies that fail to narrow down explained variable to private sector credit. From all the studies, the factors of deposit and liquidity ratio seemed frequent. While investment portfolio as a factor is rarely mentioned among the studies, foreign liabilities and private sector credit as factors are mere punctuations;

and non-existing in any Nigerian studies considered, though impactful in foreign studies where considered.

This current study is, therefore, poised to examine the specific of causality (long run and short run) arising from banks-specific factors, comprising of the two frequently (Deposit and liquidity) used and the three seldom used (investment portfolio, foreign liabilities and public sector credit) in studies, individually and collectively, to private sector credit. The study will examine also the collective impact of the explanatory variables on private sector credit.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1. Introduction

Thechapter presents the whole procedures undertook in the current study. The chapter looked atthe variables evaluated, the process of evaluation, and the tools or modelsused for analysis. The chapter covers the research design, population and sample of study, the source of study data, the model specification, Data analysis and techniques.

3.2. Research Design

Thestudy employedan ex-post-facto research design approach which investigated the impact, as well as the long and short run causality (or effect) of the explanatory variable of deposit money banks specific credit supply factors-the two frequently and three

rarelyused by studies - on private sector credit financing. The study focused mainly on deposit money banks credit supply factors (represented by the DMBs Specificcredit supply factors) of Deposit volume, liquid assets (the two frequently used factors by studies), Investment assets, foreign liability and public sector credit (the three non-frequently used factors by studies).

3.3. Study Data

The study used time series secondary data, relating to each of the study's variable - deposit volume,Liquid assets, Investment assets, foreign liability, public sector credit and private sector credit, spanning a period of 35 years (1981-2015). All data regarding the variables, used in this study wereobtained from the Central Bank of Nigeria (CBN)'s 2015 statistical bulletin and the National Bureau of Statistics.

3.4. Study Model Specification

The model used comprised of variables conjecturedfrom previous studies considered. Based on previous studies conducted on the determinants of bank credit supply by Olusanya, *et al* (2012), Sharma and Gounder (2012), Olokoyo (2011), Sogut (2008) and Guo and Stepanyan (2011), a group of bank specific factors (frequently and rarely used) have been extracted to develop a standard model to test the effect of DMBs specificcredit supply factors on Private sector credit financing in Nigeria. The dependent variable is proxied by the total private sector credit (PSCR) granted by DMBs in Nigeria. The independent variables adopted in this study arepurely centred around DMBs credit supply factors proxied by the variables:deposit volume, liquidity ratio, investment portfolio, public sector Credit and foreign liability. The study model is thus formulated as follows:

PSCR = f (Deposit Money Bank Specific Credit Supply factors)----------1

$PSCR_t = \alpha_0 + \alpha_1 * DPV_t + \alpha_2 * LQA_t + \alpha_3 * IVP_t + \alpha_4 * PuCr_t + \alpha_5 * FRL_t + \varepsilon_t$----------2

In order to reduce or normalise the level of noise or incidences of the effect of outliers in the time series data, the variables werelogged at levelto transform the data (Olokoyo, 2011),giving rise to equation 3 thus:

$LgPSCr_t = \alpha_0 + \alpha_1 * LgDPV_t + \alpha_2 * LgLQA_t + \alpha_3 * LgIVP_t + \alpha_4 * LgPuCr_t + \alpha_5 * LgFRL_t + \varepsilon_t$ ----- 3

where:

Private sector Credit(PSCR) is the dependent variable;

The explanatory variables include:Deposit Volume (DPV), LiquidityAssets (LQA), Investment Portfolio (IVP), Public Sector credit (PuCr), Foreign Liability (FRL).

Lg =natural logarithm, α_0 is the intercept of the regression line, $\alpha 1 \ldots\ldots \alpha 5$, each, represents coefficient of each of the explanatory variable (to explain variations in the dependent variable).

3.5. Study Model and Their Measurement.

3.5.1. Deposit volume (DPV)

The intermediation role of the DMBs primarily demands that they generate funds from the surplus segment of the economy and make same available to the deficit segment that requires the funds for productive investible projects. Locally sourced deposits is the major source of funding economic activities in Nigeria. The better and effective the ingenuity of DMBs to attract and mobilise more funds, the stronger it is expected to meet the funding needs of the productive sector of the economy. It is expected to have a positive coefficient ($\alpha_1 > 1$) in relation to private sector credit.

3.5.2. Liquid assets (LQA)

The two main activities of the DMBs are to accept funds through deposits and grant loans but a bank may however choose not to invest all available funds in credit; it

may choose to keep some funds in cash and cash equivalent (or cash convertible securities) (*e.g*. treasury bills, bonds, reserves at CBN) (Guillermo & Ingela, 1999). The more the DMBs choose to maintain their deposits or liabilities in liquid assets though at a lower return, the less the amount that can be available for credit to the private sector. Guillermo and Ingela (1999) noted that banks may want to keep more liquid assets to avoid "liquidity shock" as suggested by "liquid assets as a buffer" theory.Therefore, liquid assets are expected to have a negative coefficient ($\boldsymbol{\alpha}_2 < 1$).

3.5.3. Investment portfolio (IVP)

The source of funds to the DMBs may be limited while there are so many competing alternatives they can be put to. The DMBs may choose to invest in other assets (long or short term) with a better return and less risk than committing such funds as credit to investors. A high taste for investible assets will leave little room for funding credit need of the private sector. Hence, investment portfolio of the DMBs is expected to have a negative coefficient ($\boldsymbol{\alpha}_3 < 0$) when related to the private sector credit.

3.5.4. Public sector credit (PuCr)

According to the "lazy banking" hypothesis, "government borrowing from the banks to finance budget deficits crowds out private investment through its dampening effects on private (sector) credit" (Samah & Ahmed, 2014). The duo stated that the hypothesis aims to explain that "as government issues more debt instruments to finance its deficits, the banks shifts their portfolio away from risky private loans and opt for lazy behaviour characterised by tilting more credit towards financing government debt instrument. This goes to show that where this is the case in all developing economies, Nigeria inclusive, the public-sector credit should possess a negative coefficient ($\boldsymbol{\alpha}_4 < 0$) in relation to private sector credit.

3.5.5. Foreign liability (FRL)

Globalisation has made it possible today that domestic banks can borrow money from its counterparts abroad in foreign currencies to fund domestic lending (Xiaofen, 2012). This implies that modern day banking source of funds has gone beyond a national boundary. Local banks can now receive placements from and retain balances of foreign banks, and even deposits from foreigners to supplement local deposits. This ordinary should boost availability of funds to the private sector. There foreign liability coefficient should be positive ($\boldsymbol{\alpha}_5>0$) in relation to Private sector credit.

Table 3.1.Variable Measurements

S/N	Variable	Description/Measure	Type	Works adapted from:	Apriori Expectation
1	PSCR	Total credit to Private Sector	Dependent	Sogut (2008)	1
2	TDR	Deposit Volume	Independent	(Mwafag, 2015; Guo and Stepanyan 2011**)**	+
3	LQA	Liquid Assets	Independent	(Olokoyo, 2011; Jegede, 2014;).	–
4	IVP	Investments Portfolio	Independent	(Olokoyo, 2011; Olusanya, *et al* 2012)	–
5	FRL	Foreign Liability	Independent	(Guo and Stepanyan, 2011;Imran and Nishat, 2012)	+
6.	PuCr	Public Sector Credit.	Independent	Sogut (2008)	-

Source: Generated by the Researcher Based on previous study

3.6. Data Analysis tool and Technique

Descriptive statistics was adopted to examine the general characteristics of the variables (at level or in its raw form) used in the study before further in-depth analysis. The studythen employed econometrics approaches to analyse the data and to determine the existence and the degree of causality – long run and impactarising from the DMBs Specificcredit supply factors to private sector credit financing, and also evaluated the stated research hypothesis in chapter1; employing the Ordinary Least Square (OLS) regression analysis of the Vector Error Correction Model (VECM). E-Views 9.5 Student edition package was used as the analytical tool. According to Sayed (2016), estimation of the Vector Error Correction Model (VECM) would demand some basic requirements. These are explained below:

3.6.1. Unit Root Test

All variables are expected to be integrated of the same order*i.e.* - I (0) at level and I (1) at first difference. The determination of the stationarity of each series is a necessary condition for co-integration test, and indeed for the estimation of the error correction model, simply because each series involved in the estimation of a model must be integration of the same order (Engle and Granger 1987).The stationarity or unit root test for this study was conducted using*Augmented-Dickey Fuller(ADF) test*. The model to check the unit root is given as:

$$\Delta X_t = \lambda_0 + \lambda_1 x_{t-1} + \lambda_2 T + \sum_{i=0}^{n} \varphi i \Delta X_{t-1} + \varepsilon \text{----------4}$$

Where Δ is the difference operator; X is the natural logarithm of the series. T is a trend variable. λ and φ are parameters to be estimated and **ε** is the error term.

3.6.2. Optimal Lag Selection

Optimum lag is expected to be selected and used in the determination of existence of cointegration and the number of cointegrating equation(s). It is also useful inthe final VECM estimation for the combined, (also the individual) effect of the DMBs specific credit supply factors on private sector credit financing. Lag selection criteria of the E-view package 9.5 Student Edition was used to make this optimal lag selection.

3.6.3. Co-Integration Test

Once the variables have been established to be integrated of the same order, then the Johansen-Juselius (1990) maximum likelihood method of co-integration that shows existence of long run association-ship among the variables and the number of cointegrating vectors can be applied. Johansen co-integration test procedure consists of estimating a vector autoregressive (VAR) models which includes difference as well as the specifics of the non-stationary variables (Johansen & Julius, 1990). The equation for Johansen co-integration test is given by:

$$\Delta X_t = \tau_1 \Delta X_{t-1} + \ldots + \tau_{k-1} \Delta X_{t-k+1} + \pi X_{t-k} + \varepsilon \text{----------5}$$

Where ε is Gaussian random variable, τ_1 and $\pi$are matrices of parameters estimated using OLS. The component πX_{t-k}produces different linear combinations of specifics of the time series X_t.As such, the matrix π contains information about the long run properties of the system describe by the model.

3.6.1. Vector Error Correction Model Estimation

An error correction model is estimated upon the discovery of a long run cointegration among the variables. Engle and Granger (1987) argues that if cointegration exist among variables in the long run, then there must be either a unidirectional or bi-directional granger-causality among the variables and this can only be investigated by an error correction mechanism. VECMs are a theoretically-driven approach useful for estimating

both short-term and long-term causality (effects) of one-time series on another.The term error-correction relates to the fact that last-periods deviation from a long-run equilibrium (the error), influences its short-run dynamics. Thus, ECTs directly estimate the speed at which a dependent variable returns to equilibrium after a change in other variables. The study investigated the long run causality of DMBs specific credit supply factors onprivate sector credit financing in Nigeria. Hence, the direction of causality in the current study is unidirectional. The VECM representation for the study models therefore assumes the following form:

a). GeneralVECM equation:

$$\Delta\text{lgPSCR} = \sum_{i=1}^{N} \beta_i \Delta lgPSCR_{t-1} + \sum_{i=1}^{N} \alpha_i \Delta lgDPV_{t-1} + \sum_{i=1}^{N} \pi_i \Delta lgLQA_{t-1} + \sum_{i=1}^{N} \delta_i \Delta lgIVP_{t-1} + \sum_{i=1}^{N} \lambda_i \Delta PuCr_{t-1} + \sum_{i=1}^{N} \gamma_i \Delta lgFRL_{t-1} + Z_1 EC1_{t-1} + \varepsilon_1 \quad \ldots\ldots 6$$

In the general VECM equation 6, Δ is the first difference operator; $\beta_i, \alpha_i, \pi_i, \delta_i, \lambda_i$,and γ_i represents the short run coefficients of the lag of variables PSCR, DPV, LQA, IVP,PuCr, and FRL respectively; EC1 is the error correction term and $Z_1$is its coefficient; ε_{1t-1}isone period lag of residual obtained;

b). Individual study variable VECM model

i. $\Delta\text{lgPSCR} = \sum_{i=1}^{N} \mu_{1i} \Delta lgPSCR_{t-1} + \sum_{i=1}^{N} \varphi_{1i} \Delta lgDPV_{t-1} + Z_2 EC2_{t-1} + \varepsilon_2 \ldots\ldots 7$

ii. $\Delta\text{lgPSCR} = \sum_{i=1}^{N} \mu_{2i} \Delta lgPSCR_{t-1} + \sum_{i=1}^{N} \varphi_{2i} \Delta lgLQA_{t-1} + Z_3 EC3_{t-1} + \varepsilon_3 \ldots\ldots 8$

iii. $\Delta\text{lgPSCR} = \sum_{i=1}^{N} \mu_{3i} \Delta lgPSCR_{t-1} + \sum_{i=1}^{N} \varphi_{3i} \Delta lgIVP_{t-1} + Z_4 EC4_{t-1} + \varepsilon_4 \ldots\ldots 9$

iv. $\Delta\text{lgPSCR} = \sum_{i=1}^{N} \mu_{4i} \Delta lgPSCR_{t-1} + \sum_{i=1}^{N} \varphi_{4i} \Delta lgPuCr_{t-1} + Z_5 EC5_{t-1} + \varepsilon_5 \ldots\ldots 10$

v. $\Delta\text{lgPSCR} = \sum_{i=1}^{N} \mu_{5i} \Delta lgPSCR_{t-1} + \sum_{i=1}^{N} \varphi_{5i} \Delta lgFRL_{t-1} + Z_6 EC6_{t-1} + \varepsilon_6 \ldots\ldots 11$

Where:

μ_{1i}..... $\mu_{5i}$and φ_{1i}..... $\varphi_{5i,}$ are the short run coefficient of lag of PSCR and each of the lag of DPV, LQA,IVP, PuCr, and FRL respectively, whenthe cointegrating regression ofeach of the later variables are carried out on the PSCR.N is the number of lags; EC2 to EC6 are the resulting error correction term of model 7 to 11 respectively and $Z_2$to Z_6 are the coefficient of the lag of each of those error correction term *i.e.* EC_{2t-1} to $EC_{6t-1.}$ $\varepsilon_2$to $\varepsilon_6$are each the residual of the equation 7 to 11 respectively.

3.6.4. Residual Diagnostic and Stability Test:

Finally, to ensure the fitness of the model, the diagnostic and stability tests are also conducted; the diagnostictests examine the serial correlation, normality, and heteroscedasticity associated with theselected model.

- Serial correlation: to check whether the residual from different time periods are correlated
- Normality: to check whether the residual is normally distributed,
- Heteroskedasticity: to check whether the variance of the residuals is constant;
- Stability test: to confirm the stability of the model using Cumulative sum (CUSUM) and cumulative sum of squares recursive residuals (CUSUMSQ) tests.

3.7. Justification of Data Analysis used.

The methodology of this study is based on the use of an econometrics model known as Vector Error Correction Model (VECM). Since the objectives of the study involves the determination the long run and short run effect, arising from the DMBs-Credit Supply Factors, individually and collectively, to the PSC and the combined influence of the former on the later variable, the VECM is the most appropriate veritable econometric tool

to achieve this. Generally, according to Zubairu (2016), the use of VECM is justifiable where:

i. Data are time series and susceptible to stationarity problem

ii. There is need to avoid spurious regression results, typical of Ordinary Least Square (OLS) where stationarity of datachallenges is involved.

iii. The model is a single (or multiple) equation, as in this study, rather than being a system equation.

iv. Both long run cointegration and short run association, and causality between the dependent and independent variables of the study are of major interest area.

CHAPTER FOUR

DATA PRESENTATION, ANALYSIS AND DISCUSSION

4.1. Introduction

This chapter discusses the results of analysis of the study data bypresenting relevant them in tables, graphs, and in any other acceptable comprehensible format. It further discusses the result of relevant findings based on the analysis.

4.2. Descriptive Statistics

Summary of descriptive statistics of the variables under study are presented in Table 4.1. below. Econometrics analysis, ordinarily, is preceded by an exploration of the characteristics of the data and their compliance with basic assumptions. The regression analysis could only be useful when individual data series meets all the assumptions set *a*

priori. For instance, the normality assumption is very critical in regression analysis, and individual data series must meet its requirement to be useful in the analysis. A number of techniques can be used to establish the normality of a variable. The most common is the Jarque-Bera test statistic. The decision criterion is to either accept or reject the null hypothesis that: the distribution of the variables was not significantly different from normal distribution.

The null hypothesis is accepted when the probability (p-value) of Jarque-Bera test statistics for a variable is greater than the 5% critical value.

Indifference in the comparative analysis of the mean and median value is another important criterion to validate the normality assumption.

Table 4.1. Summary Statistics of Study variables.

Date: 01/09/17 Time: 13:34
Sample: 1981 2015

	LGPSCR	LGDPV	LGLQA	LGIVP	LGPUCR	LGFRL
Mean	5.617051	6.032927	4.788954	5.580503	4.658774	1.860135
Median	5.499854	5.789853	5.065937	5.567794	3.928182	0.726534
Maximum	9.478076	9.780862	8.558646	8.711350	8.455836	7.342142
Minimum	2.109267	2.368083	0.502652	2.044306	0.573181	-2.374081
Std. Dev.	2.526795	2.554919	2.686322	2.339787	2.623020	3.068967
Skewness	0.090191	0.069149	-0.273171	-0.056660	0.064137	0.365432
Kurtosis	1.543272	1.593834	1.645192	1.634519	1.504893	1.657321
Jarque-Bera	3.142119	2.911460	3.112076	2.737844	3.283872	3.408053
Probability	0.207825	0.233230	0.210970	0.254381	0.193605	0.181949
Sum	196.5968	211.1524	167.6134	195.3176	163.0571	65.10474
Sum Sq. Dev.	217.0796	221.9388	245.3552	186.1365	233.9279	320.2309
Observations	35	35	35	35	35	35

Source: Output from E-Views Student edition 9.5

Results in Table 4.1 indicate that the probability of Jarque-Bera test statistic for each of the variables shows a value higher than the conventional critical value of 5%. This indicates that there is a high probability that the null hypothesis was true. It therefore

implies that the six variables, each, was normally distributed at level and significant at 5% level.

The insignificant variations between the mean and the median values of each variable, in Table 4.1, lend additional credence to compliance of the variables with the normal distribution assumption.

Finally, Standard deviation is the most widely used measures of variability. Standard deviation measures the degree of dispersion of data from the mean. The lower the standard deviation, the closer the scores are to each other, and the wider the standard deviation, the more spread out the scores are. Looking at all the variables across board, the deviations are between log 2.3 and 3.06. The narrow range in the deviation also strengthens the normality assumption of the study variables.

The graphical illustrations in Appendix 1: figure 2 present the behaviour of the variables described in the descriptive statistics over time. The nature of the time series under study seems the same. Results in Appendix 1B indicate that all variables have been trending over time and therefore non-stationary at their present state.

4.3. Correlation at Level

An insight into how the initial variables correlate with each othermatters in study of this nature. Two variables are said to be correlated if they move together. Correlation matrix is based on the correlation coefficient ranging between -1 and +1. Whereas correlation coefficient of -1 shows a perfect negative linear relationship between variables, +1 shows a perfect positive linear relationship, and 0 means there is no linear relationship between variables(Sarah, 2008).Multicollinearity is said to occur if the correlation coefficient between two independent variables are as high as above 0.8(Sarah, 2008).

Table 4.2a: Collinearity at Level

	LGPSCR	LGDPV	LGLQA	LGIVP	LGPUCR	LGFRL
LGPSCR	1.000000	0.997821	0.980297	0.992457	0.986055	0.952018
LGDPV	0.997821	1.000000	0.984193	0.994831	0.988038	0.951387
LGLQA	0.980297	0.984193	1.000000	0.985555	0.963846	0.910470
LGIVP	0.992457	0.994831	0.985555	1.000000	0.976440	0.942326
LGPUCR	0.986055	0.988038	0.963846	0.976440	1.000000	0.947630
LGFRL	0.952018	0.951387	0.910470	0.942326	0.947630	1.000000

Source: Output from E-View Student Edition 9.5

Table 4.2a shows the result of correlations among the variables of this study at levels. With the least correlation coefficient among the explanatory variables being +0.91, the result shows that there is a high positive correlation, a case of serious multicollinearity. The data at this present state, if used for regression will yield a wrong model, hence wrong forecasting and wrong decision about hypothesis test result. Hence the need for a model like VECM that addresses the problem of stationarity. For instance, in Table 4.2b below, by transforming the data - taking their individual first difference,the problem of multicollinearity is resolved with the highest correlation coefficient now being +0.51.

Table 4.2b: Collinearity at First Difference

	DLGPSCR	DLGDPV	DLGLQA	DLGIVP	DLGPUCR	DLGFRL
DLGPSCR	1.000000	0.442338	0.381398	0.459905	-0.134133	-0.052061
DLGDPV	0.442338	1.000000	0.588264	0.503081	0.482790	-0.024713
DLGLQA	0.381398	0.588264	1.000000	0.509970	0.036877	0.035092
DLGIVP	0.459905	0.503081	0.509970	1.000000	-0.152864	0.203183
DLGPUCR	-0.134133	0.482790	0.036877	-0.152864	1.000000	-0.239222
DLGFRL	-0.052061	-0.024713	0.035092	0.203183	-0.239222	1.000000

Source: Output from E-View Student Edition 9.5

In summarising the results of the descriptive statistics and the correlation analysis, we conclude that whereas the data series in their present form (i.e. at level) are individually normally distributed, they are nonetheless useless for ordinary least square (OLS) regression analysis as they suffer from serious problem of multicollinearity and have been trending over time (see Appendix 1: Figure 1). This result, therefore, demand for the use of a more robust model like VECM to address this challenge.

4.4. Stationarity Test

In a multiple linear regression, testing for stationarity of data series is very essential an initial step. This is because non-stationary variable inputs in a multiple regression analysis are known to yield spurious or false regression results leading to wrong conclusions about hypothesis, and economic forecasts (Engle & Granger, 1987). Knowing the stationarity status of the variables in question also determines the appropriateness of the model adopted for the study. Vector Error Correction Model (VECM) has been adopted for this study and it demands that all variables of study should be integrated of order I(1), that is, be non-stationary at levels but must all become stationary at first difference.

The Augmented Dickey-Fuller (ADF) Test (Dickey & Fuller, 1979) was employed to ascertain the stationarity or otherwise of the variables (see Appendix 2). It is based on the simple logic that non-stationary process has infinite memory as it does not show decay in a shock that takes place in the process. Decision rule is based on the null hypothesis that: "the variable has a unit root (non-stationary)" as against alternative hypothesis that "the variable has no unit root (stationary)". Decision is reached by comparing the ADF test probability values (p-value) (at both Level and First Difference for each variable) with the 5% significance level. The null hypothesis is accepted where p-value is greater than 5%, but rejected where p-value is less than or equal to 5%. Table 4.3. summarises the result of the test.

Table 4.3:Summary result of Stationarity Test

Stationarity Test Result using ADF					
Variables	**Levels (p-value)**	**Null Hypothesis**	**1st Difference (p-value)**	**Null Hypothesis**	**Integration order**
LgPSCR	0.9776	Accepted	0.0041	Rejected	**I(1)**
LgDPV	0.8773	Accepted	0.0155	Rejected	**I(1)**
LgLQA	0.4896	Accepted	0.0049	Rejected	**I(1)**
LgIVP	0.5851	Accepted	0.0072	Rejected	**I(1)**
LgPuCr	0.941	Accepted	0.0000	Rejected	**I(1)**
LgFRL	0.905	Accepted	0.0000	Rejected	**I(1)**

Source: Compilation of result summary from E-View 9.5 Student Edition Output

From the result in Table 4.3, all the study variables are non-stationary at level - they all have p-values greater than the 5% significant level, but become stationary after differencing once (p-values less than 5% significant level). This indicates that the variables are all integrated of order I(1); a necessary and compulsory precondition for the use of VECM. At the first difference where the variables are stationary, the decay in a shock that takes place in the process has been acknowledged with the fluctuating nature of the plots around the origin (see Appendix 1: figure 3).

4.5. Optimal Lag selection

In the adoption of econometrics approach such as co-integration test and VECM estimation, the choice of optimal lag is non-negotiable for a reliable result. Optimal lag selection can be done with the aid of several criteria, individually or combined, such as the sequential modified LR test, Final prediction error (FPE), Akaike Information Criterion (AIC), Schwarz information criterion (SC) and Hannan-Quinn information Criterion (HQ). The AIC is adopted by this study because according to Sarah (2008), it yields better result particularly when the number of observations are less than sixty. According to AIC selection criterion, the lower the test statistic, the better the model. This study is therefore selecting optimum lag of 2; base on the recommendation of AIC in Appendix 3.The optimal lag used for all the models are summarised below in Table 4.4

Table 4.4. Optimal Lag Specification

Models						
	General	**Specific**				
	Combined Variable	*lgPSCR-lgDPV*	*lgPSCR-lgLQA*	*lgPSCR-lgIVP*	*lgPSCR-lgPuCr*	*lgPSCR-lgFRL*
Optimal no. of Lag	2	8	5	5	4	9

Source: Generated from E-view 9.5 Student edition.

4.6. Co-Integration Test.

This is an important analysis that helps to test for a long run stable relationship among the variables of interest in a study. When a linear combination of variables that are integrated of the same order*i.e.*I(0) and I(1), produces a stationary series, then the variables may need to be cointegrated (Olokoyo, 2011). This means that a long-run relationship may exist among them, implying that they may wander from one another in the short-run but in the long-run they will move together. Following the approach of Johansen and Juselius (1990), the Maximal Eigen value was utilized to determine the number of co-integration vectors (see Appendix 4). When the Max Eugen statistics is greater than the critical value at 5% level of significance or the p-value is less than or equal 5%, we fail to accept the null hypothesis (*) stating that "there is no co-integrating equation (or none)", but if otherwise, we accept the null hypothesis.

The result of the cointegration test between the dependent variable and the independent variables-combined and individually - is summarised below in Table 4.5.

Table 4.5. Johansen Cointegration Test Result using Max Eigen

Hypothesised No.of CE(s)	Max Eigen Stat	Critical Value at 5%	P-Value	Decision on Hypothesis	Identified No.of Equations
General Model					
None*	*42.22074*	*40.07757*	*2.82%*	Reject	2
Specific Models					
			LgPSCR-LgDPV		
None*	*16.84974*	*14.2646*	*1.91%*	Reject	1
			LgPSCR-LgLQA		
None*	*16.30613*	*14.2646*	*2.35%*	Reject	1
			LgPSCR-LgIVP		
None*	*18.15285*	*14.2646*	*1.16%*	Reject	1
			LgPSCR-LgPuCr		
None*	*15.50726*	*14.2646*	*3.16%*	Reject	1
			LgPSCR-LgFRL		
None*	*65.2434*	*14.2646*	*0.00%*	Reject	1

Source: Output fromE-view 9.5 Student Edition

From the Table 4.5 above, the Max Eigen statistics for the variables combined in the general model is 42.22074 while the critical value at 5% is 40.07757. Since the Max Eigen statistics is greater than the critical value, this is an evidence thata long run association exist among all the variables of study or that they move together jointly in the long run. The test result also indicated that, pairing each of the explanatory variable with the dependent variable, they individually, together with the independent variable, cointegrate or associate in the long run. This is because their individual Max Eigen statistics value is greater than the critical value at 5% level of significance.

4.7. Vector Error Correction Model Estimates

Following the confirmation that the variables areintegrated of order I(1) and cointegrate or relate in the long run, the estimation of the VECM, to establish the long run causality of the DMBs specific credit supply factors on private sector credit financing in Nigeria, is conducted. For a long run causality to be said to have existed from one variable to the other, the error correction term (ECT) must be negative and at the same time significant at 5% level. Anything short of this cannot be taken for a long run causality. The complete and detailed VECM equation is generated via the mechanism of system equation. Detailed results of the vector error correction estimate of the study for the general model, together with the specific models based on the pairing of the dependent variable with each of the explanatory variable, is as presented in Appendix 5. The result both long run and short run causality can be deduced, though the focus of the current study is the long run causality of the explanatory variables of the study on the dependent variable.

4.7.1. Long run causality result summary

Table 4.7.1 immediately below, gives a summarised version of the long run causality results extracts from the Appendix 5.

Table 4.7.1. Vector Error Correction Model – Long run result summary

Models	**ECT Rate**	**Sign of Coefficient**	**P-value at 5%**	**Observation**

General Model	*0.321358*	-	*4.49%*	ECT negative and Significant
	Other Statistics			
	R-Squared	*0.723854*		
	F-Statistics	*3.182969*		
	Prob(F-Statistics)	*0.012866*		
Specific Models	**ECT Rate C (1)**	**Sign of Coefficient**	**P-value at 5%**	**Observation**
LgPSCR-LgDPV	*1.324197*	+	*2.70%*	ECT positive and Significant
LgPSCR-LgLQA	*0.361884*	-	*0.31%*	ECT negative and Significant
LgPSCR-LgIVP	*0.653342*	-	*0.93%*	ECT negative and Significant
LgPSCR-LgPuCr	*0.069672*	+	*6.33%*	ECT positive and Non-Significant
LgPSCR-LgFRL	*0.104207*	-	*28.24%*	ECT negative and Non-Significant

Source: Output from E-View 9.5 Student Edition

From Table 4.7.1., the result of the vector error correction model for the general model indicates that the speed of adjustment to equilibrium by the dependent variable (i.e. ECT), after a change in any of the explanatory variable, is given by 32.14%. The error correction term (ECT) is negative and significant at 5% level – an indication of long run causality of private sector credit financing in Nigeria by the independent variables of the study.

The model also portends a strong signal of goodness of fit. The R^2 of 0.723854 indicates that 72.4% of variation in the private sector credit financing in Nigeria, is explained, jointly, by deposit volume,liquid assets, investment portfolio, public sector credit and foreign liability of the DMBs. The F-statistics of 3.182989, with a p-value of 0.012866, which is significant at 5% level, also signifies that the variables of the study, combined, significantly influence private sector credit financing in Nigeria.Therefore, the study concludes that on the basis of the goodness of fit, the model is accepted as reliable for hypothesis and any other economic forecast.

The significantly negative ECT leads to the rejection of the study null hypothesis (H_1) in chapter one stating that: "In the long run, DMBs specific credit supply factors does not cause Private Sector Credit financing in Nigeria". Meaning that in Nigeria DMBs specific credit supply factors cause private sector credit financing in Nigeria.The second main null hypothesis (H_2) stating that: "DMBs specific credit supply factors have no statistically significant impact on Private Sector Credit financing in Nigeria" is also rejected because the f-statistics is significant at 5% level.

Aside examining the long run causality of DMBs specific credit supply factors - regressing the explanatory variables jointly with the dependent variable (lgPSCR) - the study was also interested in knowing whether or not long run causality exist from each of the explanatory variable (*i.e*. lgDPV, lgLQA, lgIVP, lgPuCr, and lgFRL) to lgPSCR. The outcome of the resulting VECM on the pairwise basis in Table 4.6. revealed that while some variables cause private sector credit financing in the long run, others do not.

The VECM result for lgPSCR–lgDPV model, yielded a positive ECT of +1.324197 and significant at 5% with a p-value of 2.7%. A positively significant ECT does not connote any causality.This shows lgDPV does not cause lgPSCR in the long run. Therefore, the study failed to reject the null hypothesis H_{03}which states that: "In the long run, DMBs deposit volume does not cause private sector credit financing in Nigeria".

The result of VEC model for both model lgPSCR-lgLQA and lgPSCR-lgIVP, however, yielded ECTs of -0.361884 and -0.653342 respectively, and significant at 5% (*i.e*. p-value of 0.31% and 0.93% respectively). This implies that the liquid assets and investment portfolio of the DMBs, each, causes private sector credit financing in Nigeria in the long run.Null hypothesis $H_{04}$and $H_{06}$of the study stating, respectively, that: "In the long run, DMBs Liquid asset does not cause private sector credit financing in Nigeria" and "In the

long run, DMBs Investment portfolio does not cause private sector credit financing in Nigeria" are rejected.

The lgPSCR-lgPuCr VEC model, had anECT of 0.069672 whichis positive and nonsignificant at 5% level because the p-value of 6.33% is greater than 5%. The study concludes thatlgPuCr,hence, has no known long run causality on private sector financing in Nigeria.This also helps the study to fail to reject the null hypothesis H_{05}which states that:"In the long run, DMBs Public sector credit causes private sector financing in Nigeria".

The last specific VEC model, lgPSCR-lgFRL, on the other hand, though had a negative ECT (*i.e.*-0.104207), it is, however,not significant at 5% level (p-value >5%) and so could not establish any long run causality of foreign liability on private sector credit financing in Nigeria. The study once again failed to reject the null hypothesis H_{07}stating that "In the long run, DMBs foreign liability causes private sector credit financing in Nigeria".

4.7.2. Short run causality result summary

The fall out of the VECM equation for the general modelin Appendix 6aalso produced some short run causality result. Short run causality is established with the aid of WALD Test criteria.

The WALD test criterial is employed to test the null hypothesis which states that: "There is no short run causality arising from any of the explanatory study to the dependent variable". This is obtained by equating the coefficient(s) of the lag of an explanatory variable to zero (see Appendix 6a). The decision criterion is to accept the null hypothesis

where thep-value of the chi-squared is greater than 5% significant level and reject where chi-squared is less. Table 4.7. summarises the result of the WALD Test.

Table 4.7.2. Short Run Causality Result Summary.

Study Variable	Chi-Square	P-value at 5%	Remark	Short Run Causality Decision
LgDPV	2.380561	30.41%	>5%	No Short run causality Exist
LgLQA	4.497815	10.55%	>5%	No Short run causality Exist
LgIVP	7.362874	2.52%	<5%	Short run causality Exist
LgPuCr	8.047845	1.79%	<5%	Short run causality Exist
LgFRL	5.399863	6.72%	>5%	No Short run causality Exist

Source: Output of E-View 9.5 Student Edition

Table 4.7.2shows the outcome of the short run causality test. From the result, except for investment portfolio (LgIVP) and public sector credit (LgPuCr) with p-value of 2.52% and 1.79% respectively, which are less than the 5% significant level, all other variables: Deposit volume (LgDPV), Liquid assets (LgLQA), and Foreign Liability (LgFRL) had their respective p-values greater than 5%. This connotes that only investment portfolio and public sector credit have a short run causality running from them to the private sector credit financing in Nigeria while the remaining three do not.

4.8. Post Model Estimation Tests

These are subsequent tests carried out on the model to ensure the model is reliable enough for economic forecast or hypothesis testing. These tests are classified into two categories, namely: Residual diagnostic tests and stability test.

4.8.1. Residual Diagnostic tests.

Tests conducted to ensure the residuals of the model are free from the effect of Serial (auto) correlation, problem of heteroscedasticity, and are normally distributed.

4.8.1.1Serial Correlation Test

Also, known as auto correlation, serial correlation occurs when an important variable is omitted or a wrong variable has been included in a model (Sarah, 2014). This development causes the residual or error term to become correlated thereby invalidating the model result (Sayed, 2016). Serial correlation analysis is carried out to determine autocorrelation of errors in a regression model. Breusch-Pagan Godfrey Test can be very handy at testing for serial correlation. The null hypothesis that: "residuals of the Vector Error Correlation Model are not serially correlated" is to be accepted or rejected base on the p-value outcome of the Breusch-Pagan Godfrey test. Where the p-value is greater than the 5% significant level, the null hypothesis is accepted but where the p-value is less, the null hypothesis is rejected. The result of the test is presented in Table 4.8.1.1.

Table 4.8.1.1. Serial Correlation Test

Study Variable	**Obs*R-sq.**	**P-Value At 5%**	**observation**	**Remark**
Combined	2.494322	0.2873	p-value>5%	No Effect
Specific Models				
LgPSCR-LgDPV	18.65287	0.0000	p-value <5%	Effect Exist
lgPSCR-LgLQA	0.258761	0.8786	p-Value >5%	No Effect
lgPSCR-LgIVP	4.295802	0.1167	p-Value >5%	No Effect
lgPSCR-LgPuCr	2.883548	0.2365	p-Value >5%	No Effect
lgPSCR-LgFRL	6.408357	0.0406	p-Value >5%	Effect Exist

Source: Output from E-views 9.5 Student Edition.

Based on the results in Table 4.8.1.1, the general model has an Observed R-squared equalled2.494322, Chi- Square p-value of 28.73%, which is more than 5% - signifying a zero effect of autocorrelation.The null hypothesis is therefore accepted and the study concludes that the model is serially uncorrelated. On the specific models, except for

lgDPV (p-value =0.00%) and lgFRL (p-value = 4.06%) with a 5% significant value of serial correlation, lgLQA, lgIVP and lgPuCr with more than 5% significant value, are free from the effect of serial correlation.

4.8.1.2**.** Test for Heteroskedasticity

One fundamental assumption with regression is that the variance of the error term or residual should be homoscedastic across all the observations. Absence of homoscedasticity, resulting in heteroscedasticity is detrimental to OLS regression in that they render the standard error inefficient and inconsistent thereby invalidating statistical test by the model. Test of heteroscedasticity using Breusch-Pagan Godfrey seeks to validate or invalidate the null hypothesis that: "the variance of the residuals of the VECM is homoscedastic". We accept null hypothesis when p-value is greater than 5% significant level and reject the null hypothesis when p-value is less. Table 4.8.1.2 presents the result.

Table 4.8.1.2. Homoscedastic Test Result.

Study Variable	**Obs*R-sq.**	**P-Value At 5%**	**Remark**
Combined	20.96506	0.2812	No effect
Specific Models			
lgPSCR-lgDPV	0.047364	0.8277	No effect
lgPSCR-lgLQA	1.007995	0.3154	No effect
lgPSCR-lgIVP	2.545491	0.1106	No effect
lgPSCR-LgPuCr	0.037655	0.8461	No effect
lgPSCR-LgFRL	1.755755	0.1852	No effect

Source: Output from E-view 9.5 Student Edition

The result of the heteroscedasticity test in Table 4.8.1.2., shows that the general model has a p-value of 0.2812 (*i.e.* 28.12%) which is non-significant at 5% level of significance. This is an indication that the residual errors are homoscedastic and independent of the

regressors. All the specific models also had all their p-values greater than 5%, hence failing to reject the null hypothesis for the test. Therefore, it is concluded that all models are free from the ARCH effect.

4.8.1.3.Normal Distribution Test.

Test for normality is done to check whether the error term in the VECM is normally distributed. The basic idea behind the Jarque-Bera test is that the normal distribution (with any mean or variance) has a skewness coefficient of zero, and a kurtosis coefficient of three-zero excess kurtosis. The null hypothesis to be tested states that: "the residuals of the model are normally distributed". As usual, null hypothesis is accepted with a p-value of greater than 5% Significant level but rejected when p-value is less than 5% significant level.

Table 4.8.1.3. Models summary of Normality Test

Study Variable	**Jarque-Berra**	**P-Value At 5%**	**Remark**
Combined	2.115745	34.72%	Normal
Specific Model			
lgPSCR-lgDPV	0.241616	88.62%	Normal
lgPSCR-lgLQA	0.483027	78.54%	Normal
lgPSCR-lgIVP	1.419843	49.17%	Normal
lgPSCR-lgPuCr	14.80888	0.00%	Not Normal
lgPSCR-LgFRL	0.966827	61.67%	Normal

Source: Output from E-View 9.5 Student Edition.

From figure 4.8.1.3., the result indicates a Jarque-Bera statistics of 2.115745, with a p-value of 34.72%, for the general VEC model; implying that the general model is normally distributed. All the specific models, except the model lgPSCR-lgPuCr (p-value<5%), have all their p-values greater than 5%. The normality null hypothesis is therefore accepted for all the specific models excluding lgPSCR-lgPuCr whose residual is not normally distributed.

4.8.2. Stability Test

The stability test aims at ensuring that the general model is stable. A model is considered stable where all the short run coefficients of the model are within the critical bounds. The CUSUM statistics test is conducted to achieve this. The decision rule is that if the plot of the CUSUM statistics fall within the critical bands of the 5% confidence interval parameter, then the coefficients are within bands and hence, the model is stable.

Figure 4.1., shows the CUSUM plot result for the general model.

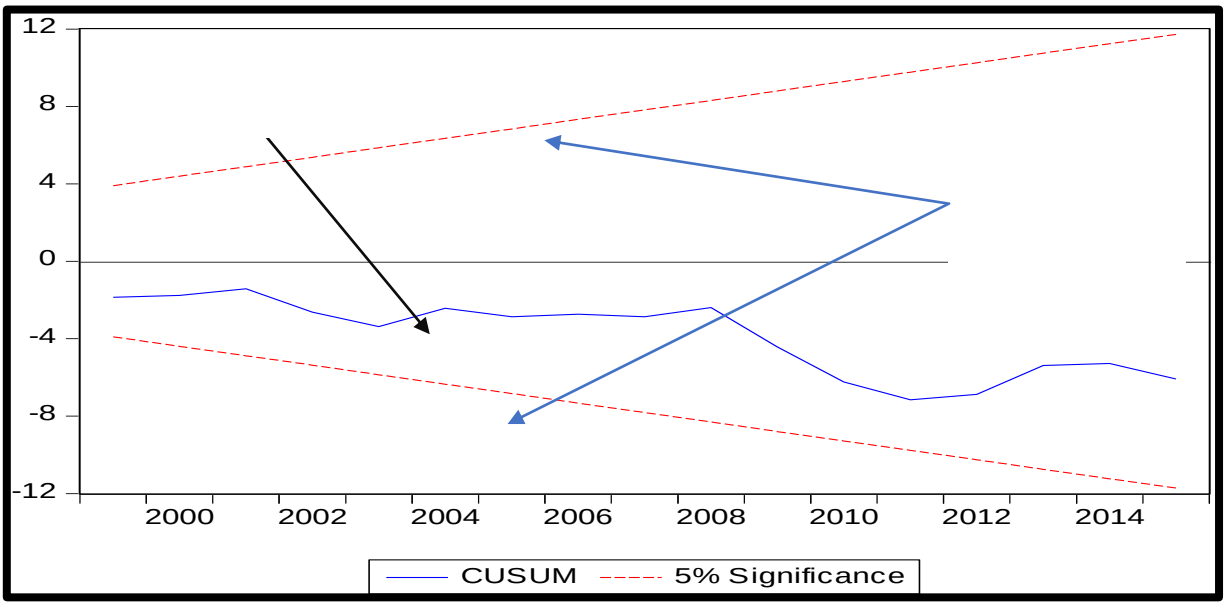


Figure 4.1. Plot of CUSUM test for Model Stability

Figure 4.1., above, shows that the CUSUM plot is within the 5% significant level (i.e. not outside the bands). It therefore confirms the stability of the coefficients, and invariably, the model as a whole. The model is therefore considered stable.

4.9. Discussion of Findings

The study examined "Effect of Deposit Money Banks specific credit supply factors on Private sector credit financing in Nigeria". The nature of the data being an economic data, demanded that stationarity test be conducted to know how stable they were since economic data are known to be well unstable, that is, trending over time in their raw form. The stationarity test conducted using ADF confirmed the non-stationarity of the

data at level but established stationarity at first differencing of the data. The data were therefore integrated of same order I(0) at level and I(1) at first difference. The integration of the series at same order informed the conduct of cointegration test, using the Max-Eigen value of Johansen Cointegration test, to determine the long run association among the variables. The cointegration outcome revealed that the explanatory variables (i.e. lgDPV, lgLQA, lgIVP,lgPuCr, and lgFRL), jointly and individually, move relate smoothly with the dependent variable (lgPSCR) in the long run; suggesting a possible long run causality in the model.

The vector error correction model was finally estimated via system equation to establish the long and short run causality that run from the explanatory variables to the dependent variables of the study. Both joint explanatory variables (as represented in the general VEC model) and specific explanatory variable (depicted in the specific VEC model) long and short run effectwere conducted.

The result from the general model indicated that in the long run, Private sector financing is jointly caused by the interplay of DMBs specific credit supply factors of deposit volume, liquid asset, investment portfolio, private sector credit and foreign liabilities and the impact is statistically significant. This result attests to the fact that DMBs, barring any macroeconomic or monetary factor influence, has a great role to play in private investment credit financing decision. It accentuates the central role of the DMBs at enhancing the long term private investment success;implying that the action or inaction of the bank has a long-term effect on private credit financing in Nigeria. The DMBs therefore cannot be absolved of the blame of none performance of private sector investment in Nigeria and consequently, the economic stagnation of the Nigerian economy.

The result of the specific long and short run causality of private sector credit financing by the explanatory variable of the study revealed that deposit volume (DPV) has neither long run nor short run causality on private sector financing in Nigeria. This result is contrary to previous studies' findings where deposit volume or deposit ratio had been found to have exerted significantly positive impact on bank loan and advances (Assefa, 2014; Kashif & Mohammed, 2013; Olokoyo, 2014; Sarah, 2014; Strike, 2015). This may not be unconnected with the fact that rather than the DMBs in Nigeria, to apply deposits or savings in line with the Harrod-Domar growth theory, which tied private investment growth to the level of savings in an economy, savings are being diverted to other channels like convertible (or marketable) securities and government bonds which DMBs perceived as less risky compared to financing the credit needs of the private investors. Having their assets in this form also guarantee against liquidity risk. The risk averseness of the DMBs might have been a better explanation for the total disconnect between deposit volume and private sector credit financing in Nigeria. This in the long run has been tragic to the economic growth of the nation knowing fully well that the ability of the private sector to accumulate capital stocks, necessary for production of goods and services, has been stalled by lack of DMBs credit support.

Liquid asset(LQA) of the DMBs was found to be significant enough to cause private sector credit in the long run in Nigeria. This finding compares favourably with earlier study findings indicating that liquidity preference of the banks often exerts significantly negative effect on private sector credit financing (Aighesi, 2015; Jegede, 2014; Kashif & Muhammed 2013; Mwafag, 2015;Yuga, 2016). The DMBs, intolerance to risk, might have found safe havens in near liquid assets or government securities which yield high returns at low risk and within short maturity period. This therefore causes underservice of funds to the private sector. Extending the frontier of knowledge in this regard the study has established that this practice of the DMBs in the long run stagnates private

investment and ultimately, economic growth. While most of the other studies results were short run in nature, this study has not been able to establish any short run causality between liquid assets of the DMBs and Private sector financing in Nigeria.

The study confirms both long run and short run causality of Private sector credit financing by Investment portfolio (IVP) of the DMBs. Not only in Nigeria has bank portfolio being found to have significantly negative impact on private sector credit, studies outside the country confirms the same (Olokoyo, 2011; Olusanya, *et al*, 2012;Olutosin, *et al,* 2012; Yuga, 2016). The period of study, in banking history in Nigeria, witnessed a sporadic expansion in bank branches and acquisition of businessesin other financial-related field, in order to live up to the expectation of universal banking (UB)by DMBs. Investments in the era of UB could not have been less detrimental to the productive sector of the Nigerian economy, as less attention would have been given to financial needs of the private sector. The heavy investment of DMBs in other long term assets, jeopardises capital stock formation of the private investors, which would have leverage production of goods and services and ultimately, the citizenry standard of living.

While the study confirms a short run causality of private sector credit financing by the Public-sector credit (PuCr) of the DMBs, the later might not have been enough to exert a long run causality on the former in Nigeria. Although advances by the banks to the government or public entities had been found to negatively influence or crowd out private sector financing both in the long run and short run according to Samah & Ahmed (2014), Sogut (2008) and Yuga (2016), external regulation from the apex bank might have limited their exposure to the government and hence the inability to command a long run effect on private investment credit.

Foreign liability (FRL), on the other hand, like deposit volume, neither has long run or short run causality on private sector financing in Nigeria. This result is contrary to what

Assefa (2014), Guo and Stephanya (2011), and Kashif and Mohammed (2013) found in their respective studies. They all submitted that foreign liability haspositive and significant impact on private sector financing in their respective countries.Foreign liability or debt has lower interest rate compared to local borrowing. This is a great incentive for DMBs to borrow abroad. It also has the merit of providing fairly stable long term funds to extend credit facilities. However, the incapacitation of foreign liabilities to cause private sector financing in Nigeria may be as a result of the strict regulation and close monitoring of DMBs foreign transactions by the apex bank in order to regularly check mate the inherent risk of foreign liability transaction. This may have limited the DMBs ability to significantly tap into this opportunity to make impact in the economy. For instance, in a circular – BSD/DIR/GEN/LAB/07/037 from CBN – titled: "Prudential Regulation for the management of foreign exchange Risks of Banks", contrary to what had subsisted before where the banks could borrow up to 200% of shareholders' fund unimpaired by losses, in foreign currency, the new regulation permitted them to borrow only 75% of their shareholders' fund unimpaired by losses, and also to ensure that their net open position (*i.e.* foreign assets less foreign liability) does not exceed 20% of shareholders' funds. Despite the restriction, DMBs still borrow but the proceeds of such borrowing, like its domestic deposits or saving, are channelled to other areas of interest of the DMBs thereby underserving or depriving the private investors the much-needed funds for their operations.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1.SUMMARY OF FINDINGS

The purpose of the study is to determine the long run and short run effects of the deposit money banks specific credit supply factors (two frequently used variables and three rarely used variables by studies in Nigeria) on the private sector credit financing in Nigeria

using econometric technique of VECM. The result of the descriptive statistics indicated that all the variables of the study were, individually, normally distributed.

Stationarity (or unit root) test was conducted using the ADF test. The results indicated that all the variables of the study (*i.e.* private sector credit financing, deposit volume, liquid assets, investment portfolio, public sector credit and foreign liability) were stationary at first differences but none at level. Johansen co-integration test was used to establish the long run relationship of the variables. The results show that the variables move together in the long run.

The result of the vector error correction model showed that in the long run, the combined variables of the deposit money banks credit supply factors cause or affect the private sector credit financing. This conclusion is reached consequent on the significance and negative value of the error correction term (ECT). The result of the VECM also revealed that the explanatory variables jointly explained significant variations in the dependent variable with an R^2 of 72.4% and F-statistics of 3.182969, significant at the 5% level.

The independent long run causality of the each explanatory variable on the dependent variable revealed that while liquid assets and investment portfolio of the DMBs exerts long run effect on private sector credit financing in Nigeria, deposit volume, public sector credit,and foreign liability have no long run effect on private sector credit financing.As for the short run causality test, only two of the listed rarely used factors of the DMBs Specific credit supply factors - investment portfolio and public sector credit - caused the private sector credit financing in Nigeria in the short run. Foreign liability, the third rarely used factor has no effect as its p-value (i.e. 0.0672) narrowly missed being significant at the 5% level.

Post estimation results indicated that there was no problem of Autocorrelation, the residuals were normally distributed and there was no problem of Heteroskedasticity for the general VEC model. The coefficients of the model are stable. The diagnostic test conducted on the specific models, however, revealed that while none of the models suffered arch effect or heteroscedasticity, lgPSCR-lgDPV and lgPSCR-lgFRL suffered from autocorrelation. All, except lgPSCR-lgPuCr, are normally distributed. No one model suffered from the effect of two or more residual deficiency. The models are therefore fit for statistical estimations and forecasts.

5.2. CONCLUSION

The first objective of the study is to determine whether deposit money banks specific credit supply factors cause private sector credit financing in the long run in Nigeria. The finding shows that the ECT is negative and significant at the 5% level which is a necessary condition for a long run causality of the dependent variable by the explanatory variables. It is therefore concluded that in Nigeria, private sector credit financing is caused jointly by the DMBs specific credit supply factors of deposit volume, liquid assets, investment portfolio, public sector credit and foreign liability factors in the long run. This means that effects of policy changes by banks management now, regarding these variables of the study, combined, will significantly determine the performance of private sector credit financing in Nigeria into the distant future, exclusive of any external or extraneous intervening factors -macroeconomic and/or monetary policy.

The second objective was to determine the extent to which deposit money banks specific credit supply factors impact on the private sector credit financing in Nigeria. The result of the VECM model shows that deposit volume, liquid assets, investment portfolio, public sector credit and foreign liability, jointly, influence private sector credit financing

significantly - accounting for about seventy two percent variation. Other factors explain the remaining twenty eight percent variation in private sector credit financing in the country.

The third objective was to ascertain whether deposit volume causes private sector credit in the long run. The study concludes from the outcome of the model that deposit volume does not cause private sector credit in the long run in Nigeria; implying that significant portion of deposits or savings are not apply by DMBs to finance private investment needs in Nigeria.

The fourth objective was to investigate any long run causality running from liquid assets of DMBs to private sector credit financing in Nigeria. The study confirms that the level of liquid asset of the DMBs can in the long run explain variation in the level of private sector credit financing. Since this relationship has been found to be inverse in nature, increase in the DMBs appetite for high liquidity or its equivalent is capable of truncating private investment or capital accumulation in Nigeria.

The fifth objective was to investigate the long run causality of the private sector credit financing by the investments portfolio of the deposit money banks. The result shows that decisions by the deposit money banks regarding investment portfolio has had an immediate and long term impact on the private sector credit financing ability of the banks in Nigeria.

The sixth specific objective was to determine whether in the long run, deposit money banks credits to the public sector causes private sector financing in Nigeria. The outcome of the test shows that in the short run credit advances to the public sector affects private

sector credit financing in Nigeria but not in the long run. This implies that lending to the government in Nigeria has not been that significant to determine private sector credit financing in the long term.

Finally, the study also tried to find out whether foreign liabilities of the DMBs, independently, had any long run effect on private sector credit financing. Result showed that foreign liabilities does not have any long run or immediate effect on private sector financing in Nigeria, as compared to findings in other country (Xiaofen, 2012), because of strict regulation.

5.3. Recommendations

The conclusion reached by the study that the five selected deposit money banks specific credit supply variables have a long run and significant impact on private sector credit financing in Nigeria goes to show that deposit money banks, at their level, barring any influence of external factors, can through policy change significantly improve the quality of private sector credit financing in Nigeria and the impact could be massive.

In the light of this discovery, the study recommends that:

1. The deposit money banks in Nigeria should come up with ingenious ways of mobilising more deposits from the surplus unit of the economy, such as advertising, offering incentives for deposits, and making deposit rates more attractive, to raise the deposit leveland ensuring that greater percentage of the deposit volume so generated is applied in financing the productive sector of the economy (represented by the private investments).
2. The regulatory agency, like CBN, come up with a policy mandating the deposit money banks to make financing of the private investment a priority objective, ensuring that at least a private sector credit to total deposit ratio is maintained to a

tune of 70% at any given time by the DMBs and that government demonstrate also the will power guarantee greater percentage of the credit facility in order to allay the risk perception of the DMBs regarding this important sector of the economy.

3. Our DMBs should desist from being short sighted and self-seeking in investment matters. By promoting technological innovations via empowering the private sector, known to drive such processes, Nigerian capital-output ratio will decrease significantly in the long run, translating to more production and hence more income for savings and consumption.

4. The deposit money banks should divest from all other secondary investments and face their primary calling of developing the productive sector of the economy through effective intermediation which ensures efficient allocation of financial resources among the investing sector of the economy.

5. Notwithstanding the lack of long run effect of government borrowing from the DMBs in Nigeria, according to the study result. The crowd out effect is already being felt in the short run. The government is advised to look for alternative source of funds such as the capital market or international markets and leave the DMBs to face their primary responsibility of developing the private sector so the country will not experience any long run crowd out effect.

6. CBN should lessen their strict regulations on access to foreign liabilities by the DMBs but should rather advise them on the most efficient way of hedging against any exchange volatility risks that is inherent in such transaction. The DMBs'

access to foreign funds will serve to augment domestic deposits in increasing the pool of funds available for on-lending to the private sector and this could have a long run effect of promoting economic growth.

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Table 5: STUDY DATA INPUT

Annual Series		Private Sector Credits	Deposit Volume	Liquid Assets	Investments Portfolio	Foreign Liability	Public Sector Credit
Year		PSCR	DPV	LQA	IVP	FRL	PuCr
1981	Figures in Nigerian naira (N'Billion)	8.2422	10.6769	2.3486	7.8261	0.1160	1.7739
1982		9.8695	12.0189	2.7843	7.7238	0.2311	2.8186
1983		10.2591	13.9385	2.7610	9.6918	0.2625	5.1404
1984		10.7978	15.7348	2.1619	9.0982	0.0931	8.7261
1985		11.7052	17.5971	1.6531	8.8181	0.2614	10.2549
1986		14.8083	18.1376	2.8679	16.7278	0.8196	4.4220
1987		16.5257	23.0867	4.8721	20.5434	0.8823	7.5727
1988		19.4611	29.0651	5.2021	24.2973	0.3447	7.3096
1989		21.3340	27.1649	3.9391	30.3847	0.8508	3.6140
1990		25.2003	38.7773	8.0013	37.7380	0.2480	8.7024
1991		29.8913	52.4087	18.3474	56.7011	0.8317	6.8135
1992		38.8342	76.0735	42.5407	66.6599	1.2523	7.1344
1993		42.5802	112.4074	61.5938	87.0753	0.6362	31.3457
1994		84.7455	144.0974	77.5627	104.1094	0.6105	41.0677
1995		122.8337	182.3856	89.0633	127.0367	0.6236	23.4385
1996		153.1584	220.3322	100.2633	144.3990	0.3435	50.8145
1997		214.7624	280.0289	127.7449	209.5727	0.4480	41.9965
1998		244.6562	326.9648	158.5289	261.8559	2.0679	49.9701
1999		311.6702	516.7728	229.5684	313.7060	5.2208	190.6714
2000		429.3418	775.9323	375.9980	491.6502	14.8668	285.6307
2001		714.4732	975.5253	556.0471	673.3936	17.1854	235.0669
2002		805.3095	1209.7473	531.9393	756.6931	18.9514	484.8483
2003		1012.3652	1417.0600	622.1158	836.4691	21.0808	398.4394
2004		1278.6445	1778.7130	678.4964	995.0421	18.8935	633.7071
2005		1584.5186	2155.1598	807.4654	1266.4677	23.2784	685.3748
2006		2096.2699	3379.2757	956.3920	1973.7395	653.7937	1074.1828
2007		3861.5411	5255.9398	1479.4251	3419.8618	234.4997	2048.1614
2008		6051.6840	8252.8918	2895.7940	5467.0824	227.2230	1866.9150
2009		7385.7586	9601.8096	2137.6879	5643.5037	194.5611	2137.0054
2010		6359.6209	10610.1719	1885.4024	5938.0666	162.0241	2747.7551
2011		6098.5135	12131.4704	2012.5409	6071.4353	387.6350	3675.6502
2012		7034.0527	14245.0827	2517.8982	5803.0599	357.5166	2899.4085
2013		8730.6335	16699.0562	3808.5371	5047.7188	491.5490	4305.2860
2014		12085.9669	17042.0182	4315.1115	4945.2819	961.4739	4217.6079
2015		13070.0153	17691.9055	5211.6222	4782.7195	1544.0166	4702.4359

Sources: Central Bank of Nigeria (CBN) 2015 Statistical Bulletin**.**

APPENDIX 1: GRAPHS OF DATA SERIES AT DIFFERENT STATES

Figure 1: **Graph of Data Series at Levels (Not logged)**

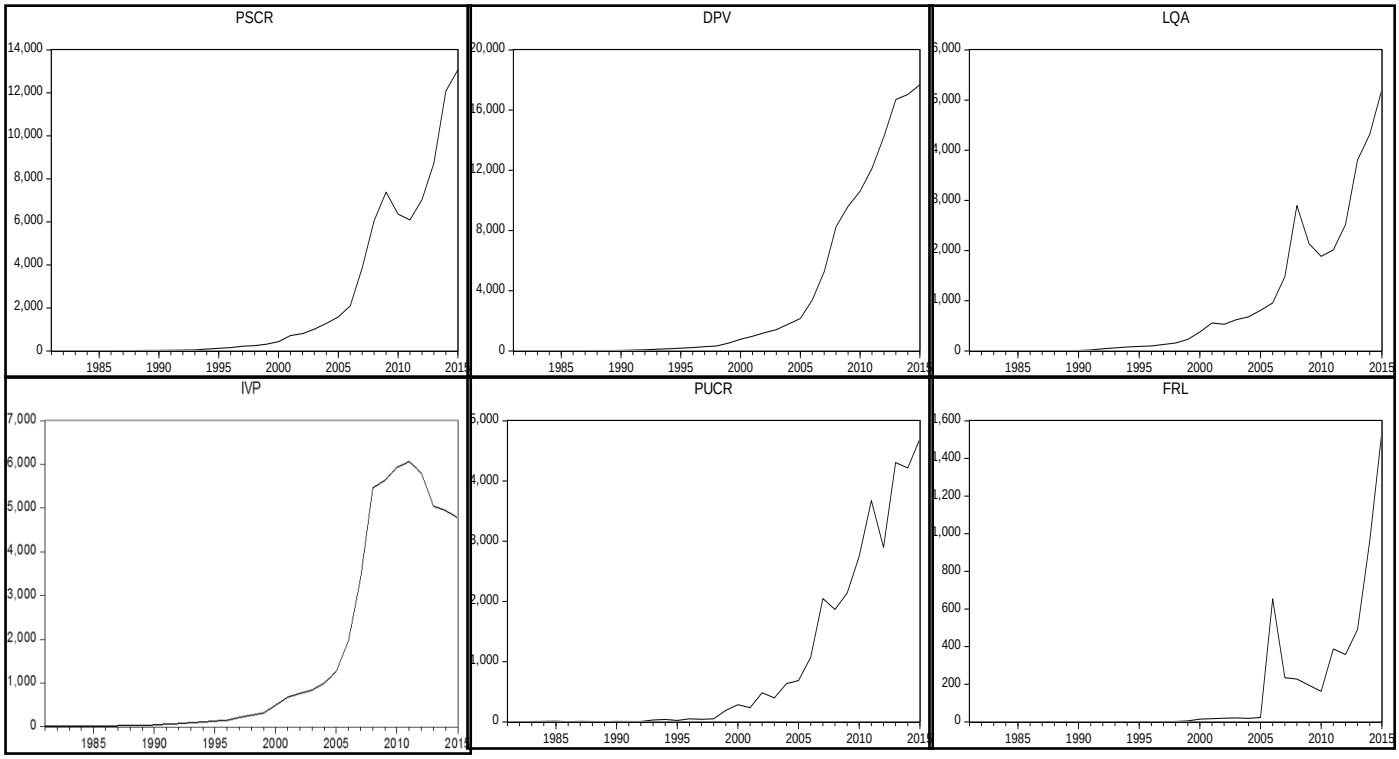


Figure 2: **Graph of Logged Data Series at Levels (**i.e**.** Non-stationary graph)

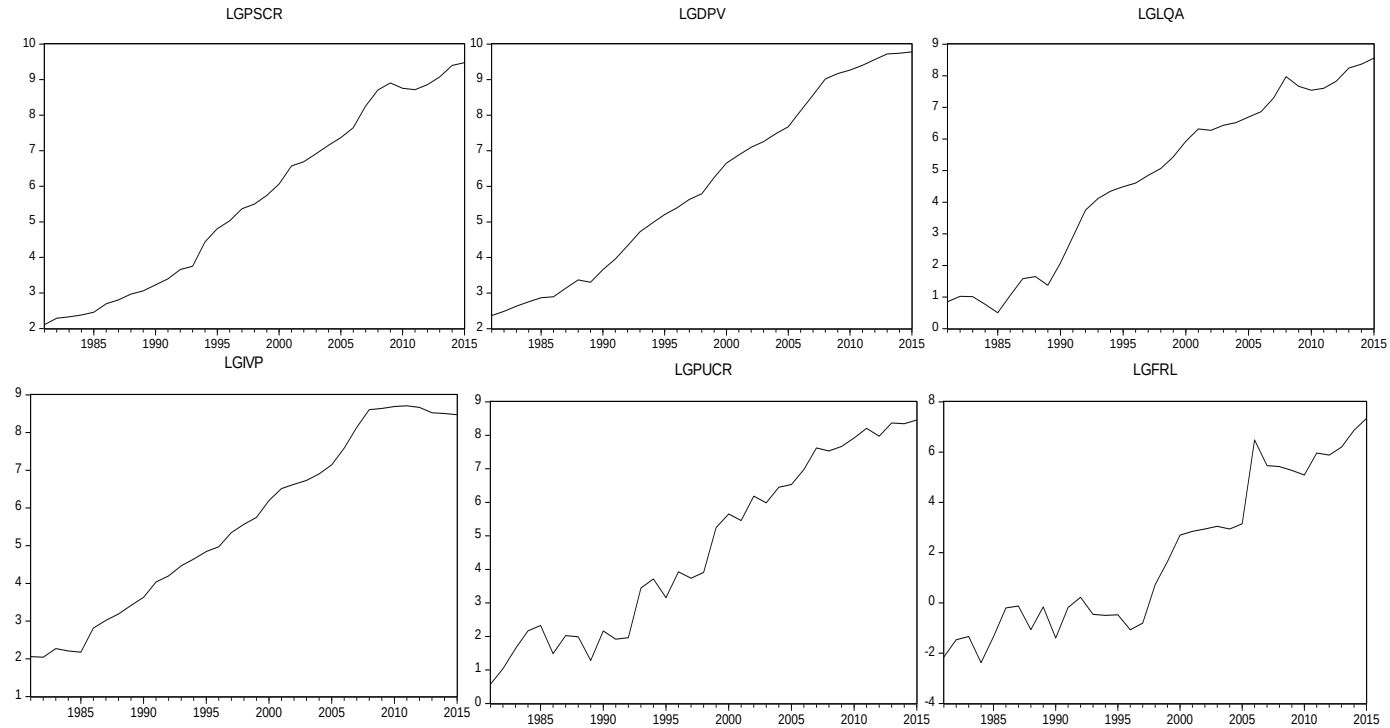
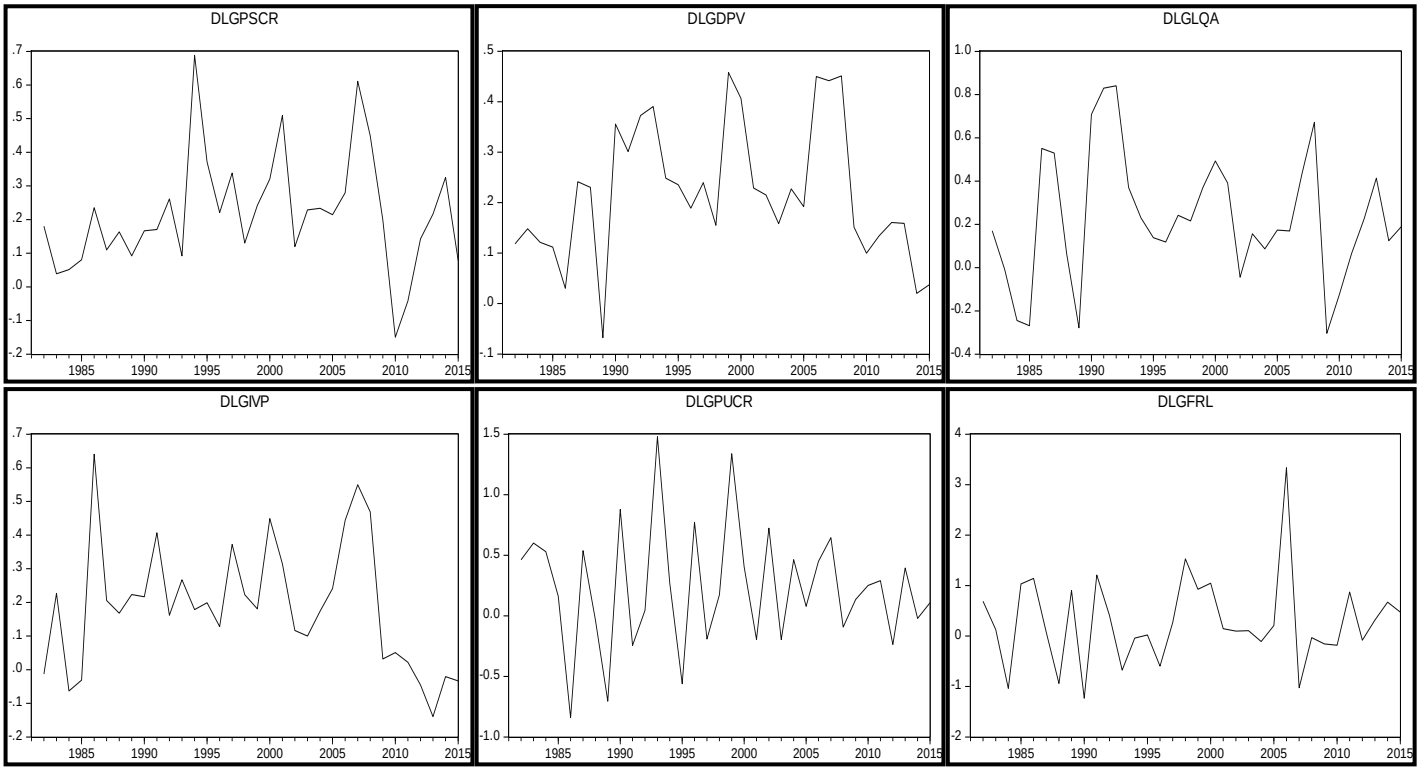


Figure 3: **Graph of Data Series at First Difference (**i.e**.** stationary graph**)**



APPENDIX 2: DATA SERIES STATIONARITY TEST AT LEVEL AND AT FIRST DIFFERENCE

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

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		0.351004	0.9776
Test critical values:	1% level	-3.639407	
	5% level	-2.951125	
	10% level	-2.614300	

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

Null Hypothesis: LGDPV has a unit root
Exogenous: Constant
Lag Length: 1 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-0.507447	0.8773
Test critical values:	1% level	-3.646342	
	5% level	-2.954021	
	10% level	-2.615817	

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

Null Hypothesis: LGLQA has a unit root
Exogenous: Constant
Lag Length: 6 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.559143	0.4896
Test critical values:	1% level	-3.689194	
	5% level	-2.971853	
	10% level	-2.625121	

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

Null Hypothesis: LGIVP has a unit root
Exogenous: Constant
Lag Length: 1 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.369380	0.5851
Test critical values:	1% level	-3.646342	
	5% level	-2.954021	
	10% level	-2.615817	

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

Null Hypothesis: LGPUCR has a unit root
Exogenous: Constant
Lag Length: 2 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-0.101267	0.9410
Test critical values:	1% level	-3.653730	
	5% level	-2.957110	
	10% level	-2.617434	

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

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

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-0.360105	0.9050
Test critical values:	1% level	-3.639407	
	5% level	-2.951125	
	10% level	-2.614300	

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

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

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.998235	0.0041
Test critical values:	1% level	-3.646342	
	5% level	-2.954021	
	10% level	-2.615817	

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

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

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.467284	0.0155
Test critical values:	1% level	-3.646342	
	5% level	-2.954021	
	10% level	-2.615817	

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

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

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.931988	0.0049
Test critical values:	1% level	-3.646342	
	5% level	-2.954021	
	10% level	-2.615817	

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

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

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.780194	0.0072
Test critical values:	1% level	-3.646342	
	5% level	-2.954021	
	10% level	-2.615817	

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

Null Hypothesis: DLGPUCR has a unit root
Exogenous: Constant
Lag Length: 1 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.177611	0.0000
Test critical values:	1% level	-3.653730	
	5% level	-2.957110	
	10% level	-2.617434	

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

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

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.873938	0.0000
Test critical values:	1% level	-3.646342	
	5% level	-2.954021	
	10% level	-2.615817	

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

APPENDIX 3: OPTIMAL LAG SELECTION

VAR Lag Order Selection Criteria
Endogenous variables: LGPSCR LGDPV LGLQA LGIVP LGPUCR LGFRL
Exogenous variables: C
Date: 12/08/16 Time: 13:17
Sample: 1981 2015
Included observations: 33

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-134.8781	NA	0.000206	8.538066	8.810158	8.629617
1	58.48613	304.6951*	1.54e-08*	-0.999159	0.905487*	-0.358304*
2	97.77824	47.62681	1.59e-08	-1.198681*	2.338518	-0.008521

* indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

VAR Lag Order Selection Criteria
Endogenous variables: LGPSCR LGPUCR
Exogenous variables: C
Date: 05/06/17 Time: 06:52
Sample: 1981 2015
Included observations: 30

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-80.68575	NA	0.849318	5.512383	5.605796	5.542267
1	1.284408	147.5463	0.004701	0.314373	0.594612*	0.404024
2	6.620304	8.893161	0.004321	0.225313	0.692379	0.374731*
3	8.354915	2.659737	0.005083	0.376339	1.030231	0.585525
4	16.32574	11.15916*	0.003982*	0.111617*	0.952336	0.380570
5	16.58907	0.333552	0.005282	0.360728	1.388273	0.689449

* indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

APPENDIX 4: RESULT OF JOHANSEN CO-INTEGRATION TEST

a). Combined Variable.

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.883081	68.68066	40.07757	0.0000
At most 1 *	0.687478	37.21862	33.87687	0.0192
At most 2	0.561147	26.35491	27.58434	0.0712
At most 3 *	0.496369	21.94914	21.13162	0.0383
At most 4	0.217771	7.859463	14.26460	0.3931
At most 5 *	0.127040	4.347704	3.841466	0.0371

Max-eigenvalue test indicates 2 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

b). Dependent – Explanatory variable paired Cointegration

Date: 05/06/17 Time: 07:48
Sample (adjusted): 1991 2015
Included observations: 25 after adjustments
Trend assumption: Linear deterministic trend
Series: LGPSCR LGFRL
Lags interval (in first differences): 1 to 9

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.926461	67.17587	15.49471	0.0000
At most 1	0.074204	1.927525	3.841466	0.1650

Trace test indicates 1 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.926461	65.24834	14.26460	0.0000
At most 1	0.074204	1.927525	3.841466	0.1650

Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Date: 05/06/17 Time: 08:16
Sample (adjusted): 1987 2015
Included observations: 29 after adjustments
Trend assumption: Linear deterministic trend
Series: LGPSCR LGIVP
Lags interval (in first differences): 1 to 5

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.465252	20.40563	15.49471	0.0084
At most 1	0.074741	2.252778	3.841466	0.1334

Trace test indicates 1 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.465252	18.15285	14.26460	0.0116
At most 1	0.074741	2.252778	3.841466	0.1334

Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Date: 05/06/17 Time: 06:56
Sample (adjusted): 1986 2015
Included observations: 30 after adjustments
Trend assumption: Linear deterministic trend
Series: LGPSCR LGPUCR
Lags interval (in first differences): 1 to 4

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.403639	16.12355	15.49471	0.0402
At most 1	0.020333	0.616287	3.841466	0.4324

Trace test indicates 1 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.403639	15.50726	14.26460	0.0316
At most 1	0.020333	0.616287	3.841466	0.4324

Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Date: 05/06/17 Time: 08:45
Sample (adjusted): 1990 2015
Included observations: 26 after adjustments
Trend assumption: Linear deterministic trend
Series: LGPSCR LGDPV
Lags interval (in first differences): 1 to 8

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.476944	18.80507	15.49471	0.0153
At most 1	0.072447	1.955330	3.841466	0.1620

Trace test indicates 1 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.476944	16.84974	14.26460	0.0191
At most 1	0.072447	1.955330	3.841466	0.1620

Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Date: 05/06/17 Time: 09:01
Sample (adjusted): 1987 2015
Included observations: 29 after adjustments
Trend assumption: Linear deterministic trend
Series: LGPSCR LGLQA
Lags interval (in first differences): 1 to 5

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.430092	18.23552	15.49471	0.0188
At most 1	0.064366	1.929384	3.841466	0.1648

Trace test indicates 1 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.430092	16.30613	14.26460	0.0235
At most 1	0.064366	1.929384	3.841466	0.1648

Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

APPENDIX 5. VECTOR ERROR CORRECTION EQUATIONs

a) General Model

Dependent Variable: D(LGPSCR)
Method: Least Squares
Date: 01/22/17 Time: 14:43
Sample (adjusted): 1984 2015
Included observations: 32 after adjustments
D(LGPSCR) = C(1)*(LGPSCR(-1) + 1.96689739892*LGLQA(-1) - 2.35088239792*LGIVP(-1) - 2.22774881843*LGPUCR(-1) + 0.998214011253*LGFRL(-1) + 6.7903729118) + C(2)*(LGDPV(-1) + 1.05498988539*LGLQA(-1) - 1.79425038428*LGIVP(-1) - 1.06345288261*LGPUCR(-1) + 0.485879155599*LGFRL(-1) + 3.07579008196) + C(3)*D(LGPSCR(-1)) + C(4)*D(LGPSCR(-2)) + C(5) *D(LGDPV(-1)) + C(6)*D(LGDPV(-2)) + C(7)*D(LGLQA(-1)) + C(8) *D(LGLQA(-2)) + C(9)*D(LGIVP(-1)) + C(10)*D(LGIVP(-2)) + C(11) *D(LGPUCR(-1)) + C(12)*D(LGPUCR(-2)) + C(13)*D(LGFRL(-1)) + C(14)*D(LGFRL(-2)) + C(15)

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	**-0.321358**	**0.148418**	**-2.165223**	**0.0449**
C(2)	0.836455	0.353010	2.369497	0.0299
C(3)	0.042711	0.219692	0.194412	0.8482
C(4)	-0.438292	0.225354	-1.944907	0.0685
C(5)	0.338065	0.385947	0.875936	0.3933
C(6)	0.499090	0.377808	1.321013	0.2040
C(7)	-0.243792	0.161931	-1.505531	0.1505
C(8)	-0.296679	0.176059	-1.685116	0.1102
C(9)	0.951779	0.378463	2.514854	0.0223
C(10)	0.225276	0.309425	0.728047	0.4765
C(11)	0.144594	0.080915	1.786991	0.0918
C(12)	-0.123100	0.080561	-1.528038	0.1449
C(13)	-0.041720	0.046552	-0.896196	0.3827
C(14)	-0.093041	0.041001	-2.269235	0.0366
C(15)	0.036815	0.057325	0.642212	0.5293

R-squared	**0.723854**	Mean dependent var	0.223435
Adjusted R-squared	0.496439	S.D. dependent var	0.172584
S.E. of regression	0.122469	Akaike info criterion	-1.056936
Sum squared resid	0.254978	Schwarz criterion	-0.369872
Log likelihood	31.91097	Hannan-Quinn criter.	-0.829194
F-statistic	**3.182969**	Durbin-Watson stat	2.171919
Prob(F-statistic)	**0.012866**		

b). Pairwise Model

Dependent Variable: D(LGPSCR)
Method: Least Squares
Date: 05/06/17 Time: 08:48
Sample (adjusted): 1990 2015
Included observations: 26 after adjustments
D(LGPSCR) = C(1)*(LGPSCR(-1) - 1.09019201622*LGDPV(-1) + 1.07304033588) + C(2)*D(LGPSCR(-1)) + C(3)*D(LGPSCR(-2)) + C(4) *D(LGPSCR(-3)) + C(5)*D(LGPSCR(-4)) + C(6)*D(LGPSCR(-5)) + C(7) *D(LGPSCR(-6)) + C(8)*D(LGPSCR(-7)) + C(9)*D(LGPSCR(-8)) + C(10)*D(LGDPV(-1)) + C(11)*D(LGDPV(-2)) + C(12)*D(LGDPV(-3)) + C(13)*D(LGDPV(-4)) + C(14)*D(LGDPV(-5)) + C(15)*D(LGDPV(-6)) + C(16)*D(LGDPV(-7)) + C(17)*D(LGDPV(-8)) + C(18)

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	1.324197	0.490290	2.700844	0.0270
C(2)	-1.618677	0.724614	-2.233847	0.0560
C(3)	-1.248920	0.509963	-2.449042	0.0400
C(4)	-1.568962	0.479334	-3.273210	0.0113
C(5)	-1.313694	0.592512	-2.217158	0.0574
C(6)	-1.093365	0.389052	-2.810335	0.0228
C(7)	-0.957266	0.444552	-2.153327	0.0634
C(8)	-0.207019	0.328666	-0.629875	0.5463
C(9)	0.098378	0.240058	0.409808	0.6927
C(10)	2.368213	0.653396	3.624469	0.0067
C(11)	1.889763	0.744211	2.539285	0.0347
C(12)	1.294496	0.621398	2.083198	0.0708
C(13)	2.003768	0.624380	3.209215	0.0124
C(14)	1.474522	0.728415	2.024287	0.0775
C(15)	1.293973	0.550194	2.351850	0.0465
C(16)	1.863754	0.534453	3.487217	0.0082
C(17)	0.889267	0.652711	1.362421	0.2102
C(18)	-1.094888	0.442792	-2.472689	0.0385

R-squared	0.825033	Mean dependent var	0.246837
Adjusted R-squared	0.453229	S.D. dependent var	0.181669
S.E. of regression	0.134333	Akaike info criterion	-0.971024
Sum squared resid	0.144364	Schwarz criterion	-0.100034
Log likelihood	30.62331	Hannan-Quinn criter.	-0.720210
F-statistic	2.219001	Durbin-Watson stat	1.732188
Prob(F-statistic)	0.126426		

Dependent Variable: D(LGPSCR)
Method: Least Squares
Date: 05/06/17 Time: 07:58
Sample (adjusted): 1991 2015
Included observations: 25 after adjustments
D(LGPSCR) = C(1)*(LGPSCR(-1) - 0.207921467333*LGFRL(-1) - 5.99551740817) + C(2)*D(LGPSCR(-1)) + C(3)*D(LGPSCR(-2)) + C(4) *D(LGPSCR(-3)) + C(5)*D(LGPSCR(-4)) + C(6)*D(LGPSCR(-5)) + C(7) *D(LGPSCR(-6)) + C(8)*D(LGPSCR(-7)) + C(9)*D(LGPSCR(-8)) + C(10)*D(LGPSCR(-9)) + C(11)*D(LGFRL(-1)) + C(12)*D(LGFRL(-2)) + C(13)*D(LGFRL(-3)) + C(14)*D(LGFRL(-4)) + C(15)*D(LGFRL(-5)) + C(16)*D(LGFRL(-6)) + C(17)*D(LGFRL(-7)) + C(18)*D(LGFRL(-8)) + C(19)*D(LGFRL(-9)) + C(20)

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	-0.104207	0.086532	-1.204258	0.2824
C(2)	0.319890	0.386496	0.827665	0.4456
C(3)	0.068071	0.470748	0.144603	0.8907
C(4)	0.168154	0.352490	0.477046	0.6535
C(5)	0.064839	0.336400	0.192743	0.8547
C(6)	0.195631	0.453872	0.431028	0.6844
C(7)	0.091658	0.459901	0.199299	0.8499
C(8)	0.460764	0.606239	0.760036	0.4815
C(9)	-0.013160	0.483327	-0.027228	0.9793
C(10)	0.345123	0.514940	0.670220	0.5324
C(11)	0.028782	0.085642	0.336078	0.7505
C(12)	0.006631	0.085300	0.077734	0.9411
C(13)	0.040182	0.083466	0.481414	0.6506
C(14)	-0.083185	0.090654	-0.917610	0.4009
C(15)	0.029069	0.069232	0.419883	0.6920
C(16)	0.021262	0.083297	0.255254	0.8087
C(17)	0.063604	0.076428	0.832213	0.4432
C(18)	0.086400	0.067132	1.287012	0.2544
C(19)	0.090864	0.097695	0.930080	0.3950
C(20)	-0.253823	0.532617	-0.476558	0.6538

R-squared	0.788025	Mean dependent var	0.250049
Adjusted R-squared	-0.017481	S.D. dependent var	0.184661
S.E. of regression	0.186268	Akaike info criterion	-0.532702
Sum squared resid	0.173478	Schwarz criterion	0.442399
Log likelihood	26.65877	Hannan-Quinn criter.	-0.262250
F-statistic	0.978298	Durbin-Watson stat	2.159836
Prob(F-statistic)	0.567593		

Dependent Variable: D(LGPSCR)
Method: Least Squares
Date: 05/06/17 Time: 09:06
Sample (adjusted): 1987 2015
Included observations: 29 after adjustments
D(LGPSCR) = C(1)*(LGPSCR(-1) - 0.981201690251*LGLQA(-1) - 0.812979172373) + C(2)*D(LGPSCR(-1)) + C(3)*D(LGPSCR(-2)) + C(4)*D(LGPSCR(-3)) + C(5)*D(LGPSCR(-4)) + C(6)*D(LGPSCR(-5)) + C(7)*D(LGLQA(-1)) + C(8)*D(LGLQA(-2)) + C(9)*D(LGLQA(-3)) + C(10) *D(LGLQA(-4)) + C(11)*D(LGLQA(-5)) + C(12)

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	-0.361884	0.105190	-3.440279	0.0031
C(2)	0.212564	0.190368	1.116595	0.2797
C(3)	-0.076662	0.187652	-0.408534	0.6880
C(4)	-0.106671	0.192727	-0.553485	0.5871
C(5)	-0.215433	0.192628	-1.118387	0.2790
C(6)	-0.073522	0.205983	-0.356935	0.7255
C(7)	-0.151424	0.147893	-1.023878	0.3202
C(8)	-0.223288	0.150101	-1.487588	0.1552
C(9)	-0.266019	0.136933	-1.942686	0.0688
C(10)	0.127599	0.122824	1.038879	0.3134
C(11)	-0.279542	0.119517	-2.338931	0.0318
C(12)	0.485989	0.142509	3.410229	0.0033

R-squared	0.583604	Mean dependent var	0.233893
Adjusted R-squared	0.314171	S.D. dependent var	0.176270
S.E. of regression	0.145977	Akaike info criterion	-0.717227
Sum squared resid	0.362259	Schwarz criterion	-0.151450
Log likelihood	22.39980	Hannan-Quinn criter.	-0.540033
F-statistic	2.166047	Durbin-Watson stat	1.797650
Prob(F-statistic)	0.073801		

Dependent Variable: D(LGPSCR)
Method: Least Squares
Date: 05/06/17 Time: 08:23
Sample (adjusted): 1987 2015
Included observations: 29 after adjustments
D(LGPSCR) = C(1)*(LGPSCR(-1) - 1.12800183279*LGIVP(-1) + 0.795651283823) + C(2)*D(LGPSCR(-1)) + C(3)*D(LGPSCR(-2)) + C(4)*D(LGPSCR(-3)) + C(5)*D(LGPSCR(-4)) + C(6)*D(LGPSCR(-5)) + C(7)*D(LGIVP(-1)) + C(8)*D(LGIVP(-2)) + C(9)*D(LGIVP(-3)) + C(10) *D(LGIVP(-4)) + C(11)*D(LGIVP(-5)) + C(12)

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	-0.653342	0.222859	-2.931641	0.0093
C(2)	0.325650	0.219653	1.482568	0.1565
C(3)	0.213561	0.234335	0.911347	0.3749
C(4)	0.215683	0.253008	0.852473	0.4058
C(5)	-0.015288	0.249376	-0.061306	0.9518
C(6)	0.085492	0.216235	0.395364	0.6975
C(7)	0.075770	0.231255	0.327648	0.7472
C(8)	-0.443789	0.235500	-1.884457	0.0767
C(9)	-0.369507	0.282351	-1.308676	0.2081
C(10)	-0.406356	0.247287	-1.643254	0.1187
C(11)	-0.363014	0.257276	-1.410990	0.1763
C(12)	0.379950	0.123198	3.084065	0.0067

R-squared	0.478517	Mean dependent var	0.233893
Adjusted R-squared	0.141088	S.D. dependent var	0.176270
S.E. of regression	0.163362	Akaike info criterion	-0.492189
Sum squared resid	0.453683	Schwarz criterion	0.073589
Log likelihood	19.13673	Hannan-Quinn criter.	-0.314994
F-statistic	1.418124	Durbin-Watson stat	1.691195
Prob(F-statistic)	0.250592		

Dependent Variable: D(LGPSCR)
Method: Least Squares
Date: 05/06/17 Time: 07:09
Sample (adjusted): 1986 2015
Included observations: 30 after adjustments
D(LGPSCR) = C(1)*(LGPSCR(-1) - 0.00207270691018*PUCR(-1) - 3.98677559766) + C(2)*D(LGPSCR(-1)) + C(3)*D(LGPSCR(-2)) + C(4) *D(LGPSCR(-3)) + C(5)*D(LGPSCR(-4)) + C(6)*D(PUCR(-1)) + C(7) *D(PUCR(-2)) + C(8)*D(PUCR(-3)) + C(9)*D(PUCR(-4)) + C(10)

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	0.069372	0.035275	1.966638	0.0633
C(2)	-0.004028	0.219855	-0.018322	0.9856
C(3)	-0.110727	0.215139	-0.514676	0.6124
C(4)	-0.342627	0.214003	-1.601036	0.1250
C(5)	-0.328963	0.225988	-1.455666	0.1610
C(6)	0.000222	0.000105	2.127291	0.0460
C(7)	6.80E-05	0.000104	0.654624	0.5202
C(8)	-8.95E-05	0.000106	-0.847840	0.4066
C(9)	-0.000169	0.000142	-1.189793	0.2481
C(10)	0.395653	0.104553	3.784223	0.0012

R-squared	0.389184	Mean dependent var	0.233935
Adjusted R-squared	0.114317	S.D. dependent var	0.173204
S.E. of regression	0.163004	Akaike info criterion	-0.528889
Sum squared resid	0.531403	Schwarz criterion	-0.061823
Log likelihood	17.93333	Hannan-Quinn criter.	-0.379470
F-statistic	1.415900	Durbin-Watson stat	2.172287
Prob(F-statistic)	0.246361		

APPENDIX 6: WALD TEST OF SHORT RUN CAUSALITY

a). General Model

Wald Test: **Equation: Untitled** — **D(LgPSCR) (C(5) =C(6) =0)**

Test Statistic	Value	df	Probability
F-statistic	1.923310	(2, 17)	0.1766
Chi-square	3.846621	2	0.1461

Wald Test: **Equation: Untitled** — **D(LgIVP) (C(9) = C(10) =0)**

Test Statistic	Value	df	Probability
F-statistic	3.681437	(2, 17)	0.0469
Chi-square	7.362874	2	0.0252

Wald Test: **Equation: Untitled** — **D(LgDPV) (C(5) =C(6) =0)**

Test Statistic	Value	df	Probability
F-statistic	1.190280	(2, 17)	0.3282
Chi-square	2.380561	2	0.3041

Wald Test: **Equation: Untitled** — **D(LgPuCr) (C(11) = C(12)) =0)**

Test Statistic	Value	df	Probability
F-statistic	4.023922	(2, 17)	0.0371
Chi-square	8.047845	2	0.0179

Wald Test: **Equation: Untitled** — **D(LgLQA) (C(7) = C(8) =0)**

Test Statistic	Value	df	Probability
F-statistic	2.248908	(2, 17)	0.1360
Chi-square	4.497815	2	0.1055

Wald Test: **Equation: Untitled** — **D(LgFRL) (C(13) = C(14) =0)**

Test Statistic	Value	df	Probability
F-statistic	2.699932	(2, 17)	0.0959
Chi-square	5.399863	2	0.0672

b). Short Run Causality of Pairwise Models

Wald Test: Equation: Untitled — LgPSCR - LgDPV

Test Statistic	Value	df	Probability
F-statistic	3.324603	(8, 8)	0.0545
Chi-square	26.59682	8	0.0008

Null Hypothesis: C(10)=C(11)=C(12)=C(13)=C(14)=C(15)=C(16)=C(17)=0

Wald Test: Equation: Untitled — LgPSCR - LgIVP

Test Statistic	Value	df	Probability
F-statistic	1.608534	(5, 17)	0.2112
Chi-square	8.042669	5	0.1539

Null Hypothesis: C(7)=C(8)=C(9)=C(10)=C(11)=0

Wald Test: Equation: Untitled — LgPSCR - LgLQA

Test Statistic	Value	df	Probability
F-statistic	1.840137	(5, 17)	0.1585
Chi-square	9.200683	5	0.1013

Null Hypothesis: C(7)=C(8)=C(9)=C(10)=C(11)=0

Wald Test: Equation: Untitled — LgPSCR - LgPuCr

Test Statistic	Value	df	Probability
F-statistic	1.395842	(4, 20)	0.2713
Chi-square	5.583367	4	0.2325

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

Wald Test: Equation: Untitled — LgPSCR - LgFRL

Test Statistic	Value	df	Probability
F-statistic	1.099924	(9, 5)	0.4843
Chi-square	9.899312	9	0.3587

Null Hypothesis: C(11)=C(12)=C(13)=C(14)=C(15)=C(16)=C(17)=C(18)=C(19)=0

APPENDIX 7: POST MODEL DIAGNOSTIC TEST

a). Serial Correlation Test

Breusch-Godfrey Serial Correlation LM Test: — LgPSCR – LgDPV

F-statistic	7.616394	Prob. F(2,6)	0.0226
Obs*R-squared	18.65287	Prob. Chi-Square(2)	0.0001

Breusch-Godfrey Serial Correlation LM Test: — LgPSCR – LgIVP

F-statistic	0.957055	Prob. F(2,18)	0.4027
Obs*R-squared	2.883548	Prob. Chi-Square(2)	0.2365

Breusch-Godfrey Serial Correlation LM Test: — LgPSCR – LgLQA

F-statistic	0.067523	Prob. F(2,15)	0.9350
Obs*R-squared	0.258761	Prob. Chi-Square(2)	0.8786

Breusch-Godfrey Serial Correlation LM Test: — LgPSCR – LgPuCr

F-statistic	0.517035	Prob. F(2,3)	0.6413
Obs*R-squared	6.408357	Prob. Chi-Square(2)	0.0406

Breusch-Godfrey Serial Correlation LM Test: — LgPSCR – LgFRL

F-statistic	1.304172	Prob. F(2,15)	0.3005
Obs*R-squared	4.295802	Prob. Chi-Square(2)	0.1167

b). ARCH Effect Test

Breusch-Godfrey Serial Correlation LM Test:	LgPSCR - LgDPV		
F-statistic	7.616394	Prob. F(2,6)	0.0226
Obs*R-squared	18.65287	Prob. Chi-Square(2)	0.0001

Breusch-Godfrey Serial Correlation LM Test:	LgPSCR - LgIVP		
F-statistic	0.957055	Prob. F(2,18)	0.4027
Obs*R-squared	2.883548	Prob. Chi-Square(2)	0.2365

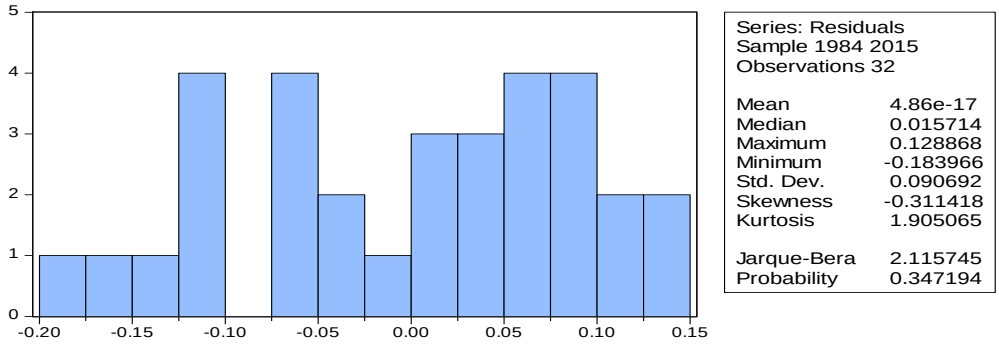
Breusch-Godfrey Serial Correlation LM Test:	LgPSCR - LgLQA		
F-statistic	0.067523	Prob. F(2,15)	0.9350
Obs*R-squared	0.258761	Prob. Chi-Square(2)	0.8786

Breusch-Godfrey Serial Correlation LM Test:	LgPSCR - LgPuCr		
F-statistic	0.517035	Prob. F(2,3)	0.6413
Obs*R-squared	6.408357	Prob. Chi-Square(2)	0.0406

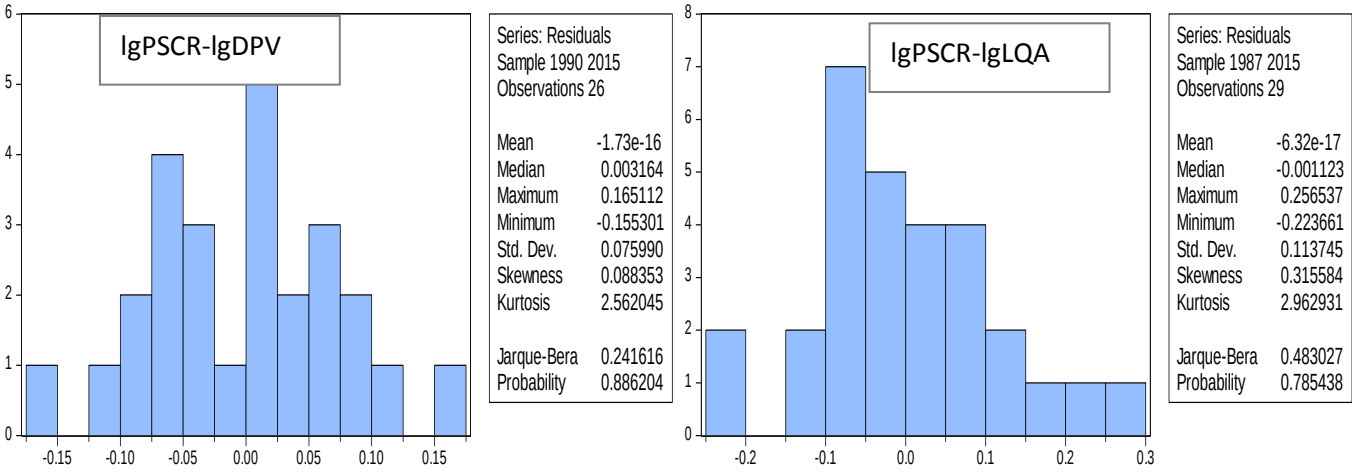
Breusch-Godfrey Serial Correlation LM Test:	LgPSCR - LgFRL		
F-statistic	1.304172	Prob. F(2,15)	0.3005
Obs*R-squared	4.295802	Prob. Chi-Square(2)	0.1167

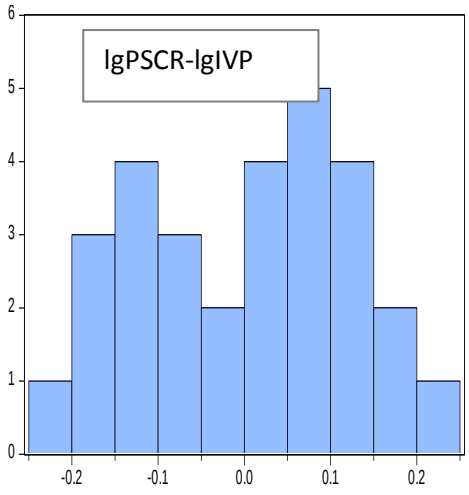
c). Normal Distribution Test.

i). General Model

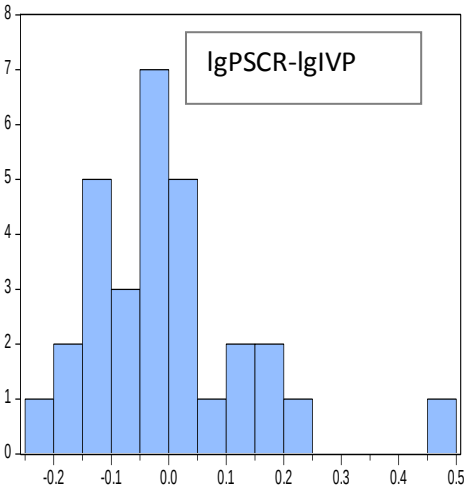


ii). Specific Model

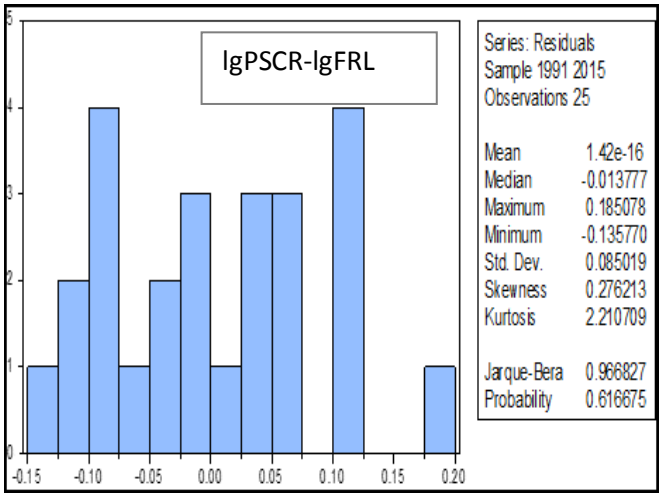




Series: Residuals	
Sample 1987 2015	
Observations 29	
Mean	-1.18e-16
Median	0.015303
Maximum	0.230421
Minimum	-0.242154
Std. Dev.	0.127291
Skewness	-0.159379
Kurtosis	1.963932
Jarque-Bera	1.419843
Probability	0.491683



Series: Residuals	
Sample 1986 2015	
Observations 30	
Mean	3.64e-18
Median	-0.008733
Maximum	0.451366
Minimum	-0.239430
Std. Dev.	0.135367
Skewness	1.206360
Kurtosis	5.454769
Jarque-Bera	14.80888
Probability	0.000609



Series: Residuals	
Sample 1991 2015	
Observations 25	
Mean	1.42e-16
Median	-0.013777
Maximum	0.185078
Minimum	-0.135770
Std. Dev.	0.085019
Skewness	0.276213
Kurtosis	2.210709
Jarque-Bera	0.966827
Probability	0.616675