

Credit Disbursement Response to Deposit Structure: Issues and Empirical Evidence From Nigerian Banks

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Abstract

This paper is aimed at investigating the effect of deposit structure (demand deposit, savings deposit and time deposit) on sectoral credit disbursement of deposit money banks in Nigeria. Deposit-Credit models patterned after multivariate regression, long-run and causality models of linear formations were estimated and analysed using the descriptive statistics and Augmented Dickey Fuller unit root test to evaluate the behaviour of the data series, while Ordinary Least Square method, Johansen Co-integration procedure and Granger Causality technique were applied to annual Nigerian data series from 1992 to 2015. The results revealed the following:(1) Demand deposit strongly influence the allocation of credit to mining and quarrying while time deposit assert positive influence on credit allocation to real estate and construction. Savings deposit also impact strongly on credit to government sector in the short run. (2) In the long run, a combination of the deposit structure components was found to exhibit significant impact on credit allocation. (3) Causality run from demand, savings, and time deposits to credit disbursed to agriculture and forestry, manufacturing and food processing, private and government sectors respectively. Credit allocated to mining and quarrying granger cause deposit structure while bi-directional causality flow between demand deposit and credit to real estate and construction respectively. The study posit that deposit structure translates to increase in credit disbursement through the window of financial intermediation, with recommendation of an improvement in deposit management strategies in order to enhance credit allocation to productive sectors of the economy.

Keywords: Deposit Structure stimuli, Credit Disbursement, Causality, sectoral credit, Nigerian Banks

1.0 Introduction

The basic function of deposit money banks in an economy hinges on financial intermediation, which involves the mobilization of deposits and effectively disbursing or channelling the funds to valuable production activities that will guarantee juicy returns on investment and help grow the economy. As such, the importance attached to financial institutions like banks in the process of economic growth of developed and developing economies derives from their key roles in the financial intermediation process. Ajie, Akekere and Ewubare (2006) describe the process of financial intermediation as that mechanism and techniques of mobilizing deposits or saved financial resources from the saving surplus units in the economy and efficiently allocating same to the needy investors in different sectors of the economy, thereby, funding investment activities and economic growth. According to Gockel and Brow (2007), bank deposit is money placed into a banking institution for safe keeping. In the opinion of Kazi (2012), deposit mobilization is a scheme intended to encourage customers to deposit more cash with the bank and this money in turn will be disbursed as loans and advances in order to generate additional revenue for the banks. The traditional business of banks is accepting deposits and allocating the mobilized funds to juicy investments in various sectors of the economy (credit disbursement). The more the credit the banks disburse the more profit they are expected to make. Also, banks depend on customer deposits to generate funds for granting credits to other customers. Sharma (2009) stated that bank credit and bank deposits are very closely related to one another in the sense that they represent two sides of the same coin, the balance sheets of banks. According to Mohan (2012), deposit mobilization is an important source of working fund for the bank.

Laura, Alfred and Sylvia (2009) stated that financial institutions offer a range of deposit products that are tailored to their particular clientele. They also offer the widest variety of specialized savings products, such that their customers have to make choice between immediately accessible, liquid products, or semi-liquid accounts or time deposits with accordingly higher interest rates. This variety of specialized savings products is what we refer to as deposit structure. The deposit structure is captured by bank accounts such as savings deposits, Fixed deposits and demand deposits. Mudita (2010) opined that bank lending channel is based on the view that banks play a special role in the financial system because they are especially well suited to solve asymmetric information problems in credit markets. The

classical studies of Schumpeter (1934), Goldsmith (1969), Mckinnon (1973) as well as Shaw (1973, 1976) articulate the potential roles of financial institutions in the economic growth process even under liberalized and repressed regimes. However, Schumpeter (1934) specifically views financial institutions as typical handmaids to industry and argues that financial institutions significantly function in a demand following manner. The novelty in Schumpeterian theory however, emanates from the point that it views financial institutions, especially the banking system as endowed with the capacity to create unlimited credit, which is a prerequisite for funding the ever expanding innovative enterprise in the economy. The above studies provide basis to content that significant interrelationship prevail between growth in the deposit mobilization of banks and credit creation or disbursement (financial intermediation process) in many countries. They could significantly support and/or promote themselves in the intermediation process.

The growth of any economy in terms of credit availability depends on capital accumulation, which in turn is a function investment and savings. It is important for the managers of the economy to stimulate investment and increase the level of saving to fund credit disbursement. Deposit Mobilization is one of the important functions of banking business. It is an important source of working fund for the bank. Bank deposit is an indispensable factor to increase the sources of the banks funds effectively. Bank deposit plays an important role in providing satisfactory service to the economy. The success of the credit disbursement greatly lies on the deposit structure. There are different types of deposits structure, with different maturity pattern with different interest rates.

Credit is the trust which allows one party to provide resources to another party where the second party does not reimburse the first party immediately (thereby generating a debt), but instead arranges either to repay or return those resources (or other materials of equal value) at a later date. Credit can be classified according to its time and quality but time classification is primary and quality identification is secondary (CBN, 2010). Deposit structure refer to a range of or variety of specialized savings products that are tailored toward particular clientele, such that bank customers have to make choice between immediately accessible, liquid products, or semi-liquid accounts or time deposits with accordingly higher interest rates. The deposit structure is captured by bank accounts such as savings deposits, Fixed deposits and demand deposits. Credit disbursement is conceived as the values of credit facilities provided or allocated by the bank financial institutions to investors or entrepreneurs, principally under conventionally securitized credits disbursement in accordance with the dictates of real bills doctrine or commercial loan theory.

The growth in credit in the Nigerian banks showed that the consolidation of banks had a very positive influence on the core private and real sector. The Nigerian banks' credit to the private sector declined from about N1,191.5 Billion in 2003 to N1,150.9 Billion in 2004, and then increased to about N1,950.4 Billion in 2005, N2,490.4 Billion in 2006, and N4,941.5 Billion in 2007, recording year on year growth rates of 26.6%, 29.3%, 27.7% and 98.4 % correspondingly (Soludo,2008). In the words of Rajeshwari (2014), it is the size of the deposits that largely decides the lending potential of a bank. Following trends, deposit money banks are the most important savings mobilization and financial resource allocation institutions. In performing these roles, banks are expected to have the potential scope and prospects for mobilizing financial resources and allocating them to productive investments, thus lending, which is underscored by bank deposit determinants.

Credit disbursement constitute those loans and advances given by specialized financial institutions inclusive of deposit money banks in Nigeria, previous community banks and present day microfinance banks which are basically aimed at leveraging the economic pursuits of the borrower. In this respect, Adeyemi (2007) observes that Nigerian government has been favourably disposed to the creation of viable credit institutions and associated environments in order to provide investors and entrepreneurs with significant financial leverage which will improve the potential and growth of their businesses. In line with the opinion of Agene (2011), credit disbursement is conceived as the values of credit facilities provided or allocated by the bank financial institutions to investors or entrepreneurs, principally under conventionally securitized credits disbursement in accordance with the dictates of real bills doctrine or commercial loan theory. Deposit Money Banks grow well on their ability to generate income through their lending activities. Since Deposit Money Banks depend on deposits as a source of funds for credit disbursement, it implies that there seems to be a relationship between the ability of the banks to mobilize deposits and the amount of credit disbursed. The incapability of banks to avail sufficient credits could be as a result of insufficient deposit fund situation.

Several studies including Aluieo et al (2012), Murty et al (2012), Nwakanma et al (2014) as well as Nuno (2012) provide compelling evidences to confirm conflicting results as to the nature of empirical relationships between bank credits, deposit structure and even economic growth of nations. The conventional deposit money banks continuously seek to expand their credit portfolios in response to demands of business enterprises. This trend is traced to the fact that deposit money banks would under normal circumstances, only lend on the basis of matching principles, preferably to short term profitable and self-liquidating investments duly securitized from the funds mobilized through the various deposit products. To this extent, deposit structure of banks has continued to contribute not only to the quantum of funds available to deposit money banks but also, to the growth in credit creation or disbursement of banks in diversified sectors of these economies.

Basically, this study hinges on the premise that there is a growing interest in credit disbursement evidenced by increasing fund mobilization (bank deposits) occasioned by the implementation of cashless policy in the economy. There are also, increased government actions inclusive of periodic reforms of the agencies and institutions that often serve as vehicles for credit policy implementation. However, irrespective of the diversity of findings on the nature of relationships between deposit mobilization and credit allocation, the studies reviewed so far fall short of any significant attempt to robustly evaluate this connectivity with respect to disaggregated analysis in terms of credit allocation to the various sectors of economy in order to empirically examine the nexus on sectoral basis in Nigeria.

While the general objective of this study is to examine the nature of interrelationships which prevail between deposit structure and sectoral credit allocations, specifically, this study will attempt to: (i) analyze the nature, magnitude and direction of prevailing short-run and long-run relationship between bank's deposit structure and credit allocations to the various sectors of classified economic activity. Put differently, this study is to investigate the structure of deposits made by customers to banks and how these could effect credit disbursements to various sectors in Nigeria. and (ii) the extent to which each of these credit allocations to various sectors of economic activity and bank's deposit structure do promote, support and/or reinforce each other in the light of recent data. These issues therefore, constitute the core problem of this study. That is, the influence of savings deposit, fixed deposit and demand deposit on credit to the private, the impact of savings deposit, fixed deposit and demand deposit on credit to the government, the effect of savings deposit on credit to: agriculture and forestry; mining and quarrying; manufacturing and food processing; real estate and construction, the influence of fixed deposit on credit to: agriculture and forestry; mining and quarrying; manufacturing and food processing; real estate and construction, the effect of demand deposit on credit to: agriculture and forestry; mining and quarrying; manufacturing and food processing; real estate and construction respectively.

The findings of this study will hopefully, contribute not only to the evolving empirical literature on the subject of deposit structure and credit disbursement in Nigeria, but in addition, the findings are expected to offer valuable basis for improved policy actions in the interest of the operators, entrepreneurs, investors and the regulators in the economy. This research work is of huge benefit to the managers of the economy, central bank, deposit money banks, policy makers and general public at large as it shall contribute significantly to the knowledge of deposit structure and credit disbursement in Nigeria. Having provided a general review of the subject, the rest of this study is divided into four distinct sections. While section 1 holds as above, section 2 provides the theoretical framework and review of related literature on the subject. section 3 offers the methodology adopted for the study while section 4 presents the analysis and results. Finally, section 5 provides the conclusions and relevant policy recommendations.

2.0 Theoretical Postulates and Literature Review

2.1 Theoretical Postulates

2.1.1 Theory of Financial Intermediation:

The studies of Shaw (1973), Mackinnon (1873), Patrick (1976), as well as Shaw (1976) brought to the fore, the intermediation roles of financial institutions like banks, which in a liberalized environment, functions at optimal levels and ensures that resources are efficiently sourced (deposit mobilization) and allocated (credit disbursement) to the needy but efficient sectors of the economy for optimal investment and economic growth.

Financial Intermediation theory advocates that banks should provide a mechanism for the mobilization and transfer of savings from the owners (depositors) to investment that promises higher returns. Financial intermediation

involves arrangements covering activities with respect to providing mechanism for organizing and managing the payment system, mechanism for the collection and transfer of savings, mechanism covering the investment in financial securities, and arrangement covering financial activities complementary to banking services. Financial intermediation refers to a financial framework that provide a medium of exchange necessary for specialization, mobilization and transfer of savings from those who generate the funds to those who use the funds for investment in the economic system where the funds will yield the highest returns. This arrangement enhances productive activities and positively influences aggregate output and capital formation while helping to mitigate financial risk in the economy (Ezirim. Muoghalu and Emenon, 2007).

(Reed et al 1980) advanced three approaches aimed at explaining the behaviour of financial institutions in respect of financial intermediation. They started with the pool of funds approach, which anchor on the premise that all funds should be pooled or deposited and allocated or disbursed to various investments according to their return implication without considering the source of the funds. The second theory called the asset allocation or conversion of fund approach distinguishes between different sources of funds (deposit structure) and requires that the source of funds be put into consideration in allocation (credit disbursement) decision. The theory considers the source of the funds (deposit structure) and encourages banks to comply with the matching principles of bank investment or credit disbursement. The third approach is the linear programming theory, which requires an explicit statement of objective to be optimized and the specific constraints facing the optimizer. The first two approaches are consistent with aggressive and conservative accommodation principles respectively. In the overall, the accumulation theory expects financial institutions' credit disbursement to be primarily related to and dictated by the nature of deposit accumulated in the economy (Ezirim. Muoghalu and Emenon, 2007).

2.1.2 Gap, Catalyst and Exigency Theses

Some postulations that is of great theoretical relevance to the issues of credits and development financial institutions which helps implementation are the Catalyst, Exigency and Gap theses. The catalyst thesis on the one hand, view the development finance institutions as functioning to fasten the intermediation process by making possible, a significant opportunity for the entrepreneurial and investors to access the necessary finance for their familiar economic ventures. This therefore, serves as a mechanism that bridges the potentially widening gap between fund suppliers and investors and most importantly, credit terms and repayment. Further the exigency thesis anchors on the urgency implicated in credit operations as a potentially dependable means of accelerating the required improvement in the economic/financial advancements of the active poor and invariably, for accelerating economic growth in various sectors of the Economy (Nwankwo,1985; Ezirim et al, 2008).

2.1.3 The Supply-Leading Finance Theory

One of the celebrated theories that lend support to credit operations and their accelerated embracement by national governments is the supply-leading finance theory. According to Robinson (2001), supply-leading finance theory basically contends that economic growth with particular emphasis on agricultural pursuits could be enhanced using the financial system through provision of subsidized credits and other agricultural inputs in advance of the demand for farm products. The theory hinges on the fact that most of the farmers hardly save and so, could not afford to procure the needed agricultural inputs, as well as pay the commercial costs of banks credits. The theory was later expanded to cover all micro enterprises, agricultural and non-agricultural and provides a significant basis for massive government embracement of green revolution in many developing economics including Nigeria in the 1960s and 1970s. However, supply-leading finance theory is criticized on the basis of the following, (i) its wide embracement could create room for continued credit subsidies, (ii) continued credit subsidies could consequent, provide room for the government to finance micro enterprises at a higher cost, (iii) it may provide opportunities within the local environment to divert the subsidized fund. This will at macro level, have the effect of suppressing savings mobilization, investments and institutional sustainability, because the subsidized cost of lending does not reflect the true cost of funds in the economy in view of efficiency of investment allocations.

2.2 Link Between Deposit Structure and Credit Disbursement

The link between the concept of deposit structure and credit disbursement is hinge on the pool of funds approach to financial intermediation, which anchor on the premise that all funds should be mobilized, pooled or deposited in various accounts and allocated or disbursed to various investments according to their return implication (Reed et

al.). The asset allocation or conversion of fund approach to financial intermediation also gave backing to the pool of fund approach by distinguishing between different sources of funds (deposit structure) and requires that the source of funds be put into consideration in allocation (credit disbursement) decision. The theory considers the source of the funds (deposit structure) and encourages banks to comply with the matching principles of bank during credit disbursement. These suggest that the nature and extent of credit disbursed in banks depend on the deposit structure-savings, fixed or demand deposits (fund sources). In support of this,

Bencivenga and Smith (1991) argued that the growth and development of banking industry in improving financial intermediation process plays a significant role in development and growth by creating savings of different kinds and channelling same to various productive activities in the economy through credit disbursement. Most importantly, this theory states that financial institution that manages its financial intermediation effectively and efficiently will improve savings, credit disbursement and progress in the real sector of an economy. The link between deposit and credit disbursement is established by banks bridging the gap between the need of lenders/depositors and borrowers by a transformation function. Banks collect funds in the form of small size deposits or short period deposits and repackage them into larger size loans or into long period residential mortgages. As such, banks perform these size or maturity transformation of deposit of varying sizes or maturity period into credits of different sizes or duration (transformation) exploiting economies of scale associated with the lending/borrowing function.

2.3 Empirical Review

In a paper titled bank deposits and demand for credits in Nigeria, Nnamdi and Mgbataogu (2015), utilized Unit root, Co-integration, Error Correction and Granger Causality techniques for a sample period of 1981 to 2013. They found significant uni-directional causality between bank credits and demand deposits, with causality flowing from demand deposit to loans and advances. They also reported bi-directional causal relationship between fixed deposits and loans and advances. They concluded that expansion in operation of demand deposit accounts by Nigerian bank customers significantly influences the demand for business and private credits in Nigeria. They recommended an intensified deposit and credit products development by Nigerian banks in order to meet the increasing demands for credit products by both the private and government business sectors in Nigeria.

In a paper titled disbursement and recovery of rural credit in Bangladesh by Nasrin and Sarker (2014), They employed mean difference t-test and econometric model. Their t-test result shows that the recovery performance of the business sector is superior to agricultural sector, that is, the agriculture sector revealed more problems in loan repayment than business sector. Also, their econometric model showed that the coefficients age and education are not statistically significant but the two variables namely business type and income level are statistically significant. They recommended that financial institutions should select the right borrowers for disbursing loan and get better recovery from these sectors. Ganbaatar and Selengee (2011) estimated the probabilities of loans for economic sectors to migrate down into lower levels by loan transition matrices. They showed strong relationships between macroeconomic variables and financial soundness indicators.

Amidu (2010) investigated the broad determinants of bank lending using a sample of 264 banks across 24 Sub-Saharan African countries during the period 2000-2007, he employed the Generalized Least Square (GLS) estimation procedure. He found that banks market structure influence credit delivery in Sub-Saharan Africa. He also finds no evidence of link between bank credits and the financial strength of the banks and that regulatory initiative which restricts banking activities imposes severe entry requirements and high regulatory capital.

Ogun and Akinlo (2010) found that bank deposits, securities holdings and total loans and advances responded slowly to monetary policy shock during the simulation period. In their findings, monetary policy shock also contributed very little to the forecast errors of these bank balance sheet variables. They concluded that bank credit channel is ineffective in Nigeria. Abuka (2008) showed evidence which suggests that bank profitability, excess liquidity, investment in government securities, the level of inflation, the size of per capita incomes as well as the level of competition in the financial sector appeared to have driven the level of bank credit extended. Uremadu (2007) found that total demand deposit liabilities leads total banking system credit extension to domestic economy in Nigeria. Total demand deposit liabilities have positively and significantly impacted on total bank credit in Nigeria.

Younus (2007) found that private sector credit has no real effect on economic growth but is inflationary. Amidu and Hinson (2006) used panel regression to examine how credit risk affects bank's capital structure, profitability and lending decisions. They found that less than 1% of Ghanaian banks are exposed to credit risk, and that more than 86% of their assets are financed by debts. They also showed that capital structure of banks is positively related to banks' credit risk, profitability and risk and negatively related to banks' size, liquid assets and lending.

Kraft and Galac (2007) estimated the impact of savings deposit interest rates on bank failures using Ordinary Least Squares (OLS) and system Generalized Method of Moment (GMM) and found that fixed saving deposit interest rate has a strong effect on bank failure since they depict the riskiness of the business environment. Cotarelli et. al. (2005) examined the long-term relationship between bank credit to the private sector to GDP ratio and a set of economic and institutional variables, using a panel data for non-transition developing and industrialized countries. They found evidence of a crowding out effect; a positive and significant relationship of lending to GDP per capita.

Égert et. al. (2006) studied the determinants of domestic bank credit to the private sector as a percentage of GDP. They used fixed-effect ordinary least squares; panel dynamic OLS and the mean group estimator, for 43 countries. They found negative relationship between private credit to GDP ratio and bank credit to the public sector, lending rate, inflation and spread between lending and deposit rates.

Albulescu (2009) assessed the growth rate of credit granted in domestic currency and of those denominated in foreign currency in Romania. He found that credit growth rate is linked positively with economic growth, deposits in domestic currency growth and unemployment rate, but negatively with net wages growth and interest rates. He also found that foreign currency credit dynamics are explained by net wages and foreign currency deposits.

Guo and Stepanyan (2011) found that domestic deposits and non-residents liabilities positively contribute to credit growth and that they symmetrically serve as funds for the latter, irrespective of the source. Vika (2009) examined the factors that affect total credit to private sector and credit denominated in domestic currency for the period 2004 to 2006 using the Generalized Method of Moment (GMM). He found a positive correlation between Nominal exchange rate, Gross Domestic Product, liquidity of the banking system and the interaction term between monetary policy indicator and liquidity

Note and Suljoti (2012) analyzed the determinants of credit growth using quarterly data for the period 2008 to 2011 for a panel of 10 countries, they found that lending was negatively influenced by Non-performing loans and interest rates. Akpansung and Babalola (2012) studied the relationship between banking sector credit and economic growth in Nigeria for the period 1970 to 2008 using 2SLS approach. They found a positive relationship between private sector credit and economic growth.

According to Nwanyanwu (2011), bank credit helps in generating self-employment, maintaining a business to take advantage of economies of scale and help prevent an economic activity from total collapse in the event of a natural disaster. In a paper by Olokoyo, (2011), he suggested that bank credit provides motivations to adopt new technologies that would have been more gradually recognized. Okwo et al (2012) established a significant and positive relationship between bank credit to the private sector and economic growth in Nigeria. They suggested an easy monetary policy regime by lowering the minimum rediscount rate, in addition to adopting direct credit control. Omara (2007) examined the credit process and repayment of bank loans in Uganda using frequencies and tables for a sample of 73 respondents, he found that there was delay by Barclays bank in scoring loans, as the bank charged commitment fee to both new and existing customers.

Empirically, a number of studies have been carried out on the effect of bank credits on real sector in Nigerian the effect of bank credits on real sector in Nigerian economy Saunder and Schumacher (2000) examined the effect of bank credit from 1989 to 1995. They observed that interest rate and current and savings accounts are likely to fall as a result of deregulation., De Gregorro and Guidoffi (1992) examined the relationship between economic growth and development and financial intermediation in Latin American countries. They adopted correlation technique. The result revealed that there is a negative correlation between economic growth and development and financial intermediation. On this result, they concluded that the negative relationship between financial intermediation and development and economic growth can be changed in the presence of controlled financial liberalization as well as

government intervention. The results are in line with the empirical evidence provided by Bayom (1996) and in woo (1994) that financial growth can delay economic growth.

Andrus (2001) observed that there is a positive relationship credit to private sector and industrial production index. Vuyyuri (2005) investigated the co integrating relationship and the causality between real and financial sector in Indian economy from 1992 to 2002. The variables adopted were exchange rate, prime lending rates, stock returns, inflation rates, and real sector proxied by output and industrial productivity. The result revealed that the Johansen Co-integration tested revealed that there is long run relationship between real sector and financial sector. Also the result of Granger causality test revealed unidirectional grander causality between real and financial sector, and the Granger causality test indicated that there is a unidirectional Granger causality between financial sector and the real sector of the economy.

According to Nzotta (2002) the factors that determine lending in Nigeria includes the following: contact position of the bank, risk and profitability of various types of bank credit, sterility of deposit, economic condition, monetary policy, fiscal policy, ability and exposure of bank personnel, credit need of the source of bank. He was of the opinion that bank credit is the act of a bank giving out loans and advances to a debtor after taking into consideration the risk and profitability that must be adhered to in such lending decision.

Ajayi (2007) examined the impact of bank credits on manufacturing sub-sector performance in Nigeria from 1975 to 2003. The result revealed that bank credits and inflation are negatively manufacturing sub sector respectively. This implies that increase in bank credits will improve manufacturing sector performance during the period under review while increase in inflation rate affects growth and development in manufacturing sector.

Ogunleye (2007) asserted that along trade cycle, the rise and fall in the rate of interest during boom and recession respectively does not determine investment but expectation. He further stated that funds for investment might be distributed by rationing and this is apparent in the Nigerian banking industry where the monetary authority (i.e. CBN) would give directions to the bank industry of economy to which much of the deposit money banks credits: - loans and advances must go.

Also, Nwanyanwu (2008) examined the effect of banks' credits in Nigeria, employing an ordinary least square (OLS) the result indicated bank credits did not significantly impact on economic growth in Nigeria. He discovered that the volume of credits granted.

Rabji and Adeoti (2010) employing binary and regression models to test agricultural credits rationing by banks to farmers in South Western Nigeria discovered that the size of farms, previous years, income of households, household net-worth and the level of agricultural commercialization are statistically significant at 11%.

Tawose (2012) investigated the impact of bank credits on the manufacturing sector performance in Nigeria from 1975 to 2009. He adopted co-integration and error correction mechanism. The result indicated that there is a positive relationship between the manufacturing sector and bank credits in the short run while on the long run negatively related.

The theoretical foundations for credit operations explain significantly, why a lot of governments especially in developing economies have largely embraced microcredit financing programmes with the anticipation that over time, the expected benefits will be actualized. To this extent governments of developing economies have established and funded a number of institutions and agencies that facilitate credit financing. They have also, taken significant steps to craft valuable number of programmes and schemes that are private sector driven in order to introduce significant elements of commercialization. In the process the governments hope to make microcredit operations and financing both profitable and efficient. Nigerian government efforts in this perspective could be traced to various policy actions commencing from the promulgation in 1939. Of the cooperative societies ordinance by then colonial administration. Other post-independence programmes include but are not limited to the establishment of significant number of institutions that financed rural/agricultural ventures for optimal productivity. They include the Commodity Boards, Nigerian Agricultural, Co-operative and Rural Development Bank, Agricultural Credit Guarantee Scheme, Rural banking Scheme, Community Banking scheme and present day Microfinance Banking Scheme which commenced on 31st day December, 2006 with its own peculiarities. Literature on microcredit/finance

operations is currently growing in terms of volume and empiricism due to growing interest in the subject. This will fundamentally, guide our comments on studies thus far.

Idachaba (1994) casts doubts on the success of re-invented Nigerian Commodity Board System as far as they concern agricultural enterprise after the failure of the first scheme. The study argues that unless the institutional rigidities in the form of inflexible government policies which constrain the boards from taking urgent actions to protect producers/farmers in response to international market dictates are addressed, the re-invented commodity board would most likely fail. Yunus(2003, 2008) observe that microcredit operations have significant potentials to alleviate poverty if the active poor are objectively funded. The study therefore, contends that if the active poor are rightly financed for their basic inputs whether on individual or group basis especially on expected income basis at the appropriate prices and non-exploitative rates, they are bound to significantly contribute to the nation's economic growth. Evaluating constraining trends in microcredit programmes, Adeyemi (2007) observes that while a significant number of government microcredit finance programmes have largely failed, those initiated by the private sector on the other hand, could only be associated with limited success. The study acknowledges that conventional commercial banks have fundamental capacity to contribute to acceleration of microcredit expansion. However, it observes that the basic fact that commercial banks view microcredit operations as cost ineffective or at best, a form of social responsibility constitutes a significant limiting factor to microcredit potentials.

Dauda (2007) alludes to the assertion that micro finance operations have potentials of improving both the savings habit of the active poor as well as their patronage of financial services products. Further, the study demonstrates that microcredit operations have not only revealed that the active poor are significantly bankable but that they are also, associated with valuable level of loan repayment culture and capacity to patronize micro insurance services. In another development, Reyemi and Quinones (2000) have compelling evidence to assert that households which access microcredit's on the average, have not only attained higher income levels, but also, tend to accumulate more assets compared to those that do not access microcredit facilities.

Relating Nigeria's experiences to those of other countries with respect to microcredit operations, Akinbuyo (2007) observes that Nigerian microfinance institutions have great potentials of improving the economy given the facts that (i) they are basically grass root institutions and (ii), micro financing is basically a less complex financial arrangement compared with conventional commercial banking. In the same vein, Jaiyeola (2012) argues that microcredit operations in Nigeria have improved the active poor's access to credit and other micro finance products in Nigeria. However, the study observes that very low success has been achieved compared to expectations. Given this scenario, the study argues that the active poor in Nigeria have only been placed at the level of sustenance without necessarily being freed from poverty. Okpara (2010) evaluates the determinants of poverty within the Nigerian entrepreneurial poor as well as the extent to which microcredit operations have contributed to improvement in the conditions of Nigeria's active poor. The study enumerates cost of starting business and running cost of micro business ventures among others as the constraints. It argues that microcredit's from the period 2001 have significantly, contributed to reduction of poverty index. Resultantly, the study recommends expansion in microcredit schemes in Nigeria.

Sharma and Puri (2013) employ Indian data to evaluate the nature of relationship between microcredit operations and India's real gross domestic product. The results based on ordinary least squares regression technique reveal a significant relationship. Nwakanma et al (2014) employed the Auto Regressive Distributed Lag Bound and granger Causality techniques in evaluating the nature of long run relationship between microcredit's and Nigeria's economic growth as well as the extent to which they promote and/or support themselves in the economic growth process. The results provide evidence to conclude the prevalence of a significant long run relationship as well as unidirectional causality which runs from Nigeria's GDP to disbursed microcredit's. Nnamdi and Nwuiyordee (2014) evaluate the nature and directions of causal relationships between the quantum of sectorial microcredit allocations and sectoral contributions to Nigeria's gross domestic product. The results reveal that among the classified five sectors of economic activity, only the other mining/quarrying sector witnesses significant causality between its contribution to Nigeria's GDP and microcredit allocations to it. The causality however, runs from the sector's contribution to GDP to microcredit's allocated to it. The rest four sectors failed the causality test at 0.05 level. The study recommends increased marketing of microcredit/ finance products in order to strengthen this relationship as well as enforcement of credit contracts to protect Nigeria's microcredit ventures.

While discussing the various dimensions of bank credit allocation and frequent banking reforms in Nigeria, Okafor (2011) notes with respect to microcredit development, that micro enterprises are usually crowded out in the credit allocation process. The study argues that micro enterprises are perceived as constituting a higher credit risk relative to bigger enterprises. Despite this discriminatory attitude by conventional banks, the study still notes that Nigerian government demonstrates significant recognition of the potentials of micro enterprises to contribute to national economic growth. This is accordingly, evidenced by various promotional strategies and mechanisms including relevant implementing institutions that the government funds over the years. Setting a taunted provoking tone for the finance of microcredits in general and agricultural credits for rural farmers in particular, Oyatoye(1983) makes a case for exigency in developing the agricultural sector in order to curtail the vicious circle of poverty in Nigeria. The study argues that the fundamental discriminatory attitude of conventional commercial banks against rural micro and agricultural ventures in particular demands that the government must as a matter of urgency, initiate the establishment of robust banks for the sole purpose of micro venture financing. The study further observes that such a bank must of necessity, entrench anticipated income/ cash flow lending fundamentals and appropriate moratorium in respect of repayment of disbursed agricultural and microcredit facilities as and when necessary.

Akosile and Ajayi (2014) evaluate the impact of credit finance operations on poverty reduction in Nigeria through the vehicle of microcredits disbursed to co-operative societies and small scale enterprises in the rural and urban enclaves. The results indicate that disbursed microcredits enhance their income levels and above all, assist them in creating wealth thereby, contributing to poverty reduction in Nigeria. Josee et al (2014) evaluate the influence of social of social media networks in assisting small scale and other micro enterprises penetrate international markets in Kenya. The results indicate that micro enterprises in Kenya have enjoyed internationalization of their activities and products through publicities gained by virtue of social networks.

3.0 Methodology

The philosophical basis of this study is on the functional connectivity between deposit mix or structure and various channels to which credits are disbursed by deposit money banks. Credit disbursement sensitivity to different functional deposit activities of the deposit money banks can be theoretically justified in terms of financial intermediation. The study applied the time series design which uses regression analysis as adapted to the problems of Financial-Economic time series, this approach is commonly treated under the label “econometrics” (Dooley, 1984). As such, the study is designed to be in line with the quasi experimental research and the classical econometric procedure, involving specifying the relevant model, estimating the parameters of the specified model and testing the hypothesis and examining the utility of the estimates/model for policy or prediction purposes, (Koutsoyiannis 1977, Gujarati 2006). The study sampled fifteen (15) deposit money banks whose securities are publicly traded in the Nigerian stock exchange.

Secondary data for estimation was collected from the Central Bank of Nigeria statistical bulletin various issues and the Nigeria Stock Exchange (NSE), Fact Book various issues, Thus, the annual time series data ranging from 1980 to 2015. The data consist of yearly data of six dependent variables at the aggregate level. They include deposit money bank credit to private sector, credit to the government, credit to agriculture and forestry; mining and quarrying; manufacturing and food processing; real estate and construction. The data also include annual time series data on savings deposit, demand deposit, fixed deposit. The financial intermediation theory helped to reveal both the dependent and independent variables and guided the selection of these indicators of credit disbursement and deposit structure. The choice of data is also guided by the availability of such data. The estimation technique employed include descriptive statistics and unit root test for evaluation of the behavior of the data series, while ordinary least square regression method, Johansen Co-integration and Granger Causality procedure are used for estimation of the short-run, long-run and cause-effect relationship between the correlates.

Operationally, demand deposit is conceptualized as the total monetary value of all the funds deposited that can be withdrawn by the owners on demand. Fixed deposit measures the value of the funds kept in the bank by the customer for a specified period without any withdrawal, usually during a year period. Savings deposit is defined as the funds deposited with the bank on which the balance standing to the customer’s credit is repayable on demand but is not expected to withdraw at random, otherwise the customer losses his/her interest for the month. Credit to Private Sector is a payment of loans and advances from the banks to the private investors in the economy. Credit to Government Sector is defined as the payment of loans and advances to the federal, state and local governments, their agencies and extra ministerial departments. Credit to Agriculture and Forestry is conceptualized as the amount of

loans and advances allocated to the agriculture and forestry subsector in order to boost economic activities designed to increase, improve and maintain the productive quality of the existing stock of capital in these sectors of the economy. Credit to Mining and Quarrying is defined as the amount of loans and advances disbursed to the mining and quarrying activities in order to increase, improve and maintain the productive quality of the existing stock of assets in these sectors of the economy. Credit to Manufacturing and Food Processing is measured as the amount of loans and advances given to the manufacturing and food processing sector so as to increase the level of productivity in these sectors of the economy. Credit to Real Estate and Construction is the amount of loans and advances allocated to the real estate and construction activities with the aim of improving and maintaining the quality of housing and infrastructures in these sectors of the economy. All these are expressed in millions of Naira.

The Model

In line with the postulations of the theory of financial intermediation and the empirical review earlier made in this study, we can hypothesize that credit disbursement activities are positive functions of deposit mix. Depending on the prevailing circumstances in the banking industry in Nigeria, these variables could be postulated to be negatively correlates of deposit structure. On this account, we can specify three-predictor models of deposit structure-credit disbursement linearly in the functional form as:

Functional Form

- CPS = F (SD, TD, DD) ----- (1)
- CGS = F (SD, TD, DD) ----- (2)
- CAF = F (SD, TD, DD) ----- (3)
- CMQ = F (SD, TD, DD) ----- (4)
- CMF = F (SD, TD, DD) ----- (5)
- CRC = F (SD, TD, DD) ----- (6)

Where:

- CPS = Bank Credit to Private sector
- CGS = Bank Credit to Government sector
- CAF = Bank Credit to Agriculture and Forestry
- CMQ = Bank Credit to Mining and Quarrying
- CMF = Bank Credit to Manufacturing and Food Production
- CRC = Bank Credit to Real Estate and Construction
- SD = Savings Deposit
- TD = Time Deposit
- DD = Demand Deposit

Transforming the mathematical model above into the econometric form gives:

The Econometric Model

$$CPS = a_0 + a_1SD_t + a_2TD_t + a_3DD_t + \mu_t \text{ ----- (7)}$$

$$CGS = b_0 + b_1SD_t + b_2TD_t + b_3DD_t + \mu_i \quad \text{----- (8)}$$

$$CAF = c_0 + c_1SD_t + c_2TD_t + c_3DD_t + \mu_i \quad \text{----- (9)}$$

$$CMQ = d_0 + d_1SD_t + d_2TD_t + d_3DD_t + \mu_i \quad \text{----- (10)}$$

$$CMF = e_0 + e_1SD_t + e_2TD_t + e_3DD_t + \mu_i \quad \text{----- (11)}$$

$$CRC = f_0 + f_1SD_t + f_2TD_t + f_3DD_t + \mu_i \quad \text{----- (12)}$$

Where: $a_0, b_0, c_0, d_0, e_0, f_0$ = Constants, $a_{1-3}, b_{1-3}, c_{1-3}, d_{1-3}, e_{1-3}$ and f_{1-3} = estimation parameters

μ_i = stochastic error term

Aprori: $a_{1-3} > 0$; $b_{1-3} > 0$; $c_{1-3} > 0$; $d_{1-3} > 0$; $e_{1-3} > 0$ and $f_{1-3} > 0$

The data analysis techniques are modeled as follows

Stationarity Test

We employ Augmented Dickey-Fuller (ADF) (1981) technique to check or test whether the time series of the data employed in this study are free from the presence of unit roots. The ADF test is based on the following regression:

$$(1-L)x_t = a + b_0x_{t-1} + \sum_{j=1}^k b_j (1-L)x_{t-j} + \mu_t$$

Where: x is the series being tested

L represents the lag operator

μ represents the stochastic error term

K represents the number of lagged differences

The hypotheses to be tested are as follows:

H_0 : x_t is non-stationary or $b_0 = 0$

H_1 : x_t is stationary or $b_0 \neq 0$

Note: The null hypothesis is rejected on the ground that the absolute value of the calculated ADF test statistics is larger than the absolute value of the Mackinnon critical value.

Test for Long-Run Relationship

The test for the presence of long-run equilibrium relationship is carried out based on the Johansen's (1991) multivariate cointegration technique. Usually applying this technique, two statistics are involved – Trace statistic and Maximum Eigen statistic: when the sample size is smaller than forty (i.e. $n < 40$), the Maximum Eigen statistic provides the more sophisticated results. Maximum Eigen Statistic can only check co-integration one by one.

Note: The null hypothesis is rejected on the ground that the values of either the Trace or Maximum Eigen Statistics are greater than the Mackinnon critical value at a prescribed level of significance usually 5% or 1% for studies in management and social sciences.

Causality Test

Granger causality test is used to examine the direction of causality between two variables. Causality means the impact of one variable on another. The rationale for conducting this test is that it enables one to know whether the

independent variables can actually cause variations in the dependent variable or vice versa. Two variables may correlate without one causing changes in the other. Thus, Granger causality test helps in adequate specification of models.

The test technique is based on the following two equations:

$$(1-L)y_t = \lambda_0 + \sum_{j=1}^p \lambda_j (1-L)y_{t-1} + \sum_{i=1}^q \lambda_i (1-L) X_{t-1} + w_t$$

$$(1-L)X_t = b_0 + \sum_{j=1}^n b_j (1-L)X_{t-1} + \sum_{i=1}^m b_i (1-L)y_{t-1} + V_t$$

Where: W_t and V_t are serially independent random vectors with zero mean and finite covariance matrix.

Each of the equations indicates that in a system, each variable expressed in first difference is regressed on its own previous values and the previous values of its causal variable. This reveals the extent to which the current value of the variable can be explained by its own past value and to check whether by adding the lagged values of another variable could improve the robustness of the explanatory power.

4.0 Data Presentation and Analysis

Discussions in this chapter will be done under the following sub-headings- data presentation in tables, data analysis and summary of findings.

4.1 Data Presentation

Table 4.1: Data on Sectoral Credit Disbursement and Deposit Structure of Banks

Year	FAF	FMQ	FMF	FRC	CPS	CSG	TD	DD	SD
1992	29.5	3.7	19.9	14.6	58.12	857.34	15.7	33.3	26.1
1993	123.2	5.7	129.6	47.5	127.12	1089.68	23.5	49.9	37.1
1994	155.4	32.2	201	34.9	143.42	1399.7	25.9	65.3	49.6
1995	98.6	17.9	124.8	102.6	180	290.16	30	79.5	62.1
1996	229.4	17.6	155.4	92.7	238.6	4032.3	44	95.9	68.8
1997	367.4	28.5	200	105.2	316.21	4189.25	52.1	128.2	84.1
1998	962.7	31	299.4	67.1	351.96	3889.45	61.3	142.3	101.4
1999	1007.2	27	293.5	71.9	431.17	1679.21	110.8	202.2	128.4
2000	1248.35	33.46	363.77	89.11	530.37	6713.57	154.4	343	164.6
2001	447.37	11.99	130.36	31.94	764.96	6895.2	235.5	448	216.5
2002	1467.71	39.34	427.69	104.77	930.49	7795.79	300.1	503.9	244.1
2003	3389.27	90.86	987.64	241.95	1096.54	9913.52	324.7	577.7	312.4
2004	3865.58	103.62	1126.44	275.95	1421.66	11411.07	401.1	728.6	359.3
2005	9704.91	260.16	2828.03	692.79	1838.39	14610.88	499	946.6	402
2006	505.23	449.33	491.98	2554.43	2290.62	18564.59	852.4	1497.9	592.5
2007	701.9	624.14	683.39	3548.24	3680.09	20657.3	1465.3	2307.9	753.9
2008	3354.3	412.4	2006.33	2139.15	6941.38	24296.33	2293.6	3650.6	1091.8
2009	4736.9	569.7	2275.7	2421.1	9147.42	24794.24	3147.3	3386.5	1171.9
2010	5102.9	520.4	2172.9	2257.4	10157.02	54612.26	2858.8	3830.3	1599.2
2011	4917.1	571	2912.5	1754.8	10660.07	62908.4	2705	4920.9	1861.4
2012	5056.8	524	2482.6	4222.3	14649.28	71713.94	3317.3	5070	2017.8
2013	4803.1	603.3	2937.3	2612	15751.84	80092.56	2839.4	5160.8	2365
2014	7,735.70	187.1	3156.5	5486.5	17129.68	89043.62	4476.7	5421.5	2522.4
2015	5628.2	471.4	3031.2	3406.4	18674.15	94114.9	4475.2	5436	2942.7

Source: Central Bank of Nigeria Statistical Bulletin

4.2 Data Analysis

4.2.1 Descriptive Statistics Analysis

The results of the descriptive statistics analyses show the behaviour of all the data series on the variables in the models. To determine the temporal properties of both the sectoral credit allocation and the aggregated demand deposit, savings deposit and time deposit data within 24 years period, a summary of the descriptive statistics is presented below:

Table 4.2: Descriptive Statistics of Sectoral Credit and Deposit Structure Variables

	DD	SD	TD	FAF	FMQ	FMF	FRC	CPS	CGS
Mean	1876.117	798.9625	1279.546	2734.947	234.8250	1226.580	1348.972	4896.273	25648.55
Median	653.1500	335.8500	362.9000	1358.030	97.24000	587.6850	258.9500	1259.100	10662.30
Maximum	5436.000	2942.700	4476.700	9704.910	624.1400	3156.500	5486.500	18674.15	94114.90
Minimum	33.30000	26.10000	15.70000	29.50000	3.700000	19.90000	14.60000	58.12000	290.1600
Std. Dev.	2090.264	919.4134	1533.375	2734.655	242.1807	1176.574	1629.728	6275.670	31014.17
Skewness	0.699668	1.051201	0.878415	0.854116	2.466977	0.517386	0.966969	1.060323	1.159067
Kurtosis	1.790533	2.708175	2.295164	2.866849	1.451844	1.549035	2.844095	2.596692	2.795330
Jurqu-bere	3.420950	4.505254	3.583245	2.935787	3.269059	3.176051	3.764422	4.659797	5.415635
Probability	0.180780	0.105123	0.166689	0.230410	0.195044	0.204329	0.152253	0.097306	0.066682
Sum	45026.80	19175.10	30709.10	65638.72	5635.800	29437.93	32375.33	117510.6	615565.3
Sumsq.	1.00E+08	19442383	54078505	1.72E+08	1348984	31839493	61088304	9.06E+08	2.21E+10
Observation	24	24	24	24	24	24	24	24	24

Source: Author's computation

From table 4.2 above, the average amount of FAF value for the 24 years period covered by the study is N2734.947 while the typical values of demand deposit (DD), savings deposit (SD) and time deposit (TD) are N1876.117, N798.9625 and N1279.546 respectively. Credit to agriculture and forestry has the average value (2734) while Demand Deposit has the mean value (1876), which was attained in the year 2007; Savings Deposit's average value was attained in 1981, 2000, and 2011 while Time Deposit has its mean value in 2002. The demand deposit maintained the largest central value, while funds allocated to real estate and construction maintained the widest spread of data from 5486 to 14.6. Hence, it is the variable with the highest range. DD, FRC and TD are the three most dynamic with standard deviation values of 2090, 1629.7 and 1533.3 respectively.

The central value for each data series in the model are best described by the median values, such that the values 1358.030, 653.1500, 335.8500 and 362.9000 provides a more valid measure of the central location of the different time series – FAF, DD, SD, and TD respectively. However, the FAF growth rate ranges from 29.50 to 9704.91 while the range of deposit structure measure of banks demand deposit, savings deposit and time deposit are from 33.30 to 5436.00, from 26.10 to 2942.70, and from 15.70 to 4476.70 respectively. FAF has the maximum value of 9704, while Demand Deposit has a maximum value of 5436 which was attained in the year 2000 and 2006 respectively. The mean of the changes in funds allocated to mining and quarrying (FMQ) is 234.8 (median 97.24). The central location for each data in the series is best described by the median values in bracket. The mean of the funds disbursed to manufacturing and food processing (FMF) is 1226.5 (median 587.6) while the average value or the mean of credit to the private sector is 4896.2 (median =1259.1). However, the credit to the private sector range from 18674.1 to 58.1.

The funds allocated to mining and quarrying ranges from 3.70 to 624.14. CGS also has a wide range of values from 94114.9 to 290.1 while CGS is the most volatile variable with a standard deviation value of 31014.17. Given that the mean of CGS, DD, SD and TD are greater than their corresponding median values, it follows that the change in these variables are positively skewed toward normality.

Following Bowman-Shelton test for normality which is based on the closeness to zero (0) of the sample skewness and the closeness to 3 of the sample kurtosis, the variables kurtosis are not all close to 3, some are leptokurtic in nature except in the case of DD it is platykurtic. This means that but for DD, the rate of change of all other variables are with higher than normal kurtosis, noting that kurtosis provides a measure of the weight in the tails of a probability density function (Newbole 1995). Judging from the fact that the kurtosis of some of the variables in the

series are either less than or more than 3, we conclude that some of the variables are platytokurtic in nature in nature while others are leptokurtic. The probability of the JB statistic are all not significant at a 5% level of significance implying that all the variables in the model are not normally distributed.

4.2.2 Unit Root Test for Model One (1)

The Augmented Dickey Fuller (ADF) unit root test conducted on the series of both at level and at first difference under the assumption of intercept, no trend and intercept are shown in table 4.3 below:

Table 4.3: ADF Unit Root Test Results

Variables	ADF	Critical Values 5%	Probability Values	Order	Remark
DD	3.641	3.004	0.013	1(1)	Stationary
SD	5.193	2.998	1.000	1(1)	Stationary
TD	3.246	3.040	0.34	1(1)	Stationary
FAF	6.618	3.005	0.000	1(1)	Stationary
FMQ	6.878	3.005	0.000	1(1)	Stationary
FMF	5.452	0.3.0124	0.0003	1(1)	Stationary
FRC	8.818	3.005	0.000	1(1)	Stationary
CPS	4.596	3.040	1.000	1(1)	Stationary
CGS	3.691	3.005	0.012	1(1)	Stationary

Source: Author's computation

Comparing the ADF test statistics and the 5% critical value, the results of the unit root test reported in table 4.8 indicate that all the variables are stationary in their first difference level at 5% level of significance. Therefore, all the variables of interest are integrated at order one 1(1). Detail of the result reveal that all the variables in models become stationary at first differencing. After stationarizing the variables, the data can then be tested whether these variables are co-integrated or not by applying Johansen Co-integration procedure. This suggest that we can proceed to test for the existence of co-integration or long run relationship among and between the variables in the models.

4.2.3 Short-Run Ordinary Least Square Test Results

The ordinary least square regression method was employed to test the short-run relationship between credit allocated and three deposit structure variables (DD, SD, and TD). The OLS – regression results are reported in table 4.4.

Table 4.4: Ordinary Least Square Regression Results

	FAF	FMQ	FMF	FRC	CSG	CPS
DD	0.032280 (0.9777)	0.268598 (0.0009)	0.391447 (0.2067)	0.311749 (0.4567)	-1.604071 (0.4256)	0.004175 (0.8729)
SD	0.921652 (0.7016)	-0.314392 (0.0402)	0.269863 (0.6701)	0.725756 (0.4059)	46.28013 (0.0000)	-0.000397 (0.9767)
TD	0.654722 (0.6256)	-0.053896 (0.5073)	-0.003339 (0.9924)	0.960299 (0.0574)	-5.773850 (0.0201)	-0.014458 (0.8191)
C	11000.274 (0.0760)	51.05309 (0.1662)	280.8436 (0.0847)	115.1995 (0.5929)	-930.2037 (0.3717)	23.07918 (0.0002)
Adj R²	0.406689	0.723802	0.777925	0.782880	0.78911	0.986178
F.Sta.	6.25169 (0.003600)	21.09124 (0.000002)	27.85613 (0.000000)	28.64406 (0.000000)	44.5490 (0.000000)	548.0114 (0.000000)
DW	1.627528	1.988901	1.808557	1.374848	1.666814	2.427585

Source: Author's computation

The regression results reveal that the three explanatory variables exhibit positive and insignificant relationship with the credit allocated to agriculture and forestry in the economy at 5% significant level. This suggests that accrual changes in total demand deposit, saving deposit and time deposit in the economy does not strongly influence the growth in the credit disbursed to the agriculture and forestry sectors in the economy. As such the independent variables have weak and positive association with FAF. This positive effect is consistent with the fact that they exert some influence but the influence is not strong enough to cause remarkable change in credit disbursement to agriculture and forestry. The adjusted R² of 0.40 show that about 40% of the variation in credit to agriculture and forestry could be explained by the deposit structure of banks in this model.

The multiple-regression results also exhibit positive and statistically significant relationship between funds allocated to mining and quarrying, and demand deposit such that, a 1% rise in the amount of demand deposit will lead to about 0.26% increase in funds allocated to mining and quarrying. The coefficient estimate of savings deposit is -0.31

and display significantly negatively relationship with the funds allocated to mining and quarrying. This suggests that a 1% increase in Savings Deposit may reduce the quantum of funds that will be allocated to mining and quarrying activities by about 0.31%. Time deposit showed weak but positive relationship with funds allocated to mining and quarrying. The R^2 of 0.72 indicate that about 72% of the adjustments in funds allocated to mining and quarrying could be explained by the specified independent variables in model 2.

The short-run regression result reveal that demand deposit and savings deposit have positive and insignificant relationship with funds disbursed to the manufacturing and food processing sector, such that 1% increase in the demand and savings deposit could lead to about 0.39% and 0.26% increase in the funds disburse to manufacturing and food processing in Nigeria. A rise in time deposit will reduce the funds allocated to manufacturing and food processing by about 0.003% showing that TD negatively and insignificantly correlate with FMF. So, time deposit has weak relationship with FMF, though the association is negative. The adjusted R^2 of 0.777 implies that about 78% variation in the FMF is explained by the explanatory variables in the model. The Durbin Watson statistics of 1.8 suggest the absence of autocorrelation in the specified model since it is close to 2. The 0.00000 value of the probability of F-statistic shows that the F-statistic is significant, thus indicating the global utility of the model.

The OLS regression result presented a positive and very weak association between DD and FRC. This relationship is insignificantly weak, though positive in nature. This may be due to the short term of demand on demand deposit and the long term required for funds that will be committed to real estate and construction. The mis-match may be the reason for the weak relationship. Savings deposit displayed a negative and insignificant relationship with funds disbursed to real estate and construction such that, a 1% increase in savings deposit would lead to about 0.72% decrease in FRC. The result also reveals that, time deposit positively and significantly correlates with funds allocated to real estate and construction in Nigeria. This means that time deposits could translate into growth in the output level of real estate and construction in Nigeria. That is, time deposits could boost credit disbursement and investment in real estate and construction significantly in Nigeria. The R^2 of suggest 0.78 that about 78% of the variations in credit allocated to the real estate and construction sector is explain by adjustments in the deposit structure variables in model four

The multiple regression results reveal that the savings and time deposits are slight negatively associated with the growth in CPS. These relationships are not significant. DD exhibit a very weak positive correlation with CPS implying that, though the association is positive, it is not significant and changes in all the explanatory variables cannot significantly influence growth in Credit to the private sector. This is a pointer to the fact that this relationship need critical examination to ascertain the reasons for this level of insignificance and that the components of deposit structure does not have significant influence on credit to the private sector in the economy.

The test result report that of the three explanatory variables, only saving deposit positively and significantly correlate with the credit to the government sector in Nigeria, such that, a 1% increase in savings deposit could lead to about 46.2% increase in CGS. Time deposit exhibit strong but negative influence on CGS, while demand deposit displayed very weak and negative association with CGS.

4.2.4 Testing the Long-Run Relationship

Table 4.5: Johansen Co-integration test results (DD, SD, TD)

	FAF	FMQ	FMF	FRC	CSG	CPS
Trace Stat.	113.6922	4.410297	31.83172	34.15929	19.97998	16.65673
Critical Value	47.85613	3.841466	29.79707	15.49471	15.49471	15.49471
No. of co.Int. eq	1	4	2	3	3	3
Prob. Value	0.0000	0.0357	0.0288	0.0000	0.0098	0.0333

Source: Author's computation

Following the ADF tests, since all the variables are stationary at first difference 1(1), the Johansen Co-integration test is undertaken and the results are presented in table 4.5 above. The co-integration procedure is performed with linear deterministic trend and lag interval of the order 1 to 1 in the vector auto-regression. If the trace statistic is larger than the critical value at 5% significance level, it means that there is long run relationship (co-integration). The values of the trace statistic in the first column is found to be larger than the corresponding 5% critical values. This implies that there is the existence of at least one co-integrating vectors in the system with regard to FAF. The

existence of the co-integrating relationship implies that the variables share mutual stochastic trend and are linked in a common long-run equilibrium. We therefore, DD, SD TD and FAF variables in the model have long run equilibrium relationship. As can be seen in table 4.5 with regard to FMQ, the result indicates that there are four co-integrating vectors and there are four variables in the model as well, therefore, the result is full rank and a bad result. This implies that there is no long run equilibrium relationship between the funds allocated to mining and quarrying and the deposit structure of banks in Nigeria. Given the trace statistic and the critical values for the hypothesized number of co-integrating equations with regard to the long-run relationship between DD, SD, TD and FMF, the test indicates the existence of two co-integrating equations at 5% level of significance as seen in table 4.5. This suggest that there are two co-integrating vectors in the three predictor model. This confirm the existence of long-run stable relationship between the funds disbursed to manufacturing and food processing sector and the deposit structure of banks in Nigeria. The result also indicate that there exist three co-integrating vector in the relationship between DD, ,SD, TD and FRC. These however indicate that there are three co-integrating equation in a three predictor model of FRC. This goes to validate the claim that there exist long-run equilibrium relationship between the credit disburse to real estate and construction and the different deposit structures of banks in Nigeria. The test result also indicates the existence of three co integrating equation in the relationship between demand deposit, savings deposit, time deposit and credit to the private sector. This result reveal that there is long-run relationship among /between Credit to the Private Sector and the deposit structure variables in the economy. We hereby we report that there exist long run equilibrium relationship among and between demand deposit, savings deposit, time deposit and credit allocated to the Government sector.

It is however reasoned by the researchers that if there exist stationarity of the variables in the model and that the subsequent co-integration test where found to be in line with theoretical expectations, then the application of conventional causality techniques between the explained and explanatory variables can be considered to be appropriate. We therefore go on checking for the break down effect and the causal effect of variables on one another.

4.2.5 Granger Causality Test Results

In Granger causality test, the null hypothesis is that there is no causality between two variables. The null hypothesis is rejected if the probability of F-statistic given in the Granger causality test result is less than 0.05. Below are the results of the Granger causality test conducted between the sectoral credit disbursement indicators and the relevant explanatory variables in this study.

Table 4.6: Pairwise Granger Causality Tests Results

Null Hypothesis:	Obs	F-Statistic	Prob.
DD does not Granger Cause FAF	23	6.87798	0.0163
FAF does not Granger Cause DD		0.04880	0.8274
SD does not Granger Cause FAF	23	6.98005	0.0156
FAF does not Granger Cause SD		1.39567	0.2513
TD does not Granger Cause FAF	23	5.37109	0.0312
FAF does not Granger Cause TD		0.00243	0.9611
DD does not Granger Cause FMQ	22	0.64898	0.5350
FMQ does not Granger Cause DD		13.3118	0.0003
SD does not Granger Cause FMQ	22	1.14640	0.3412
FMQ does not Granger Cause SD		11.0402	0.0008
TD does not Granger Cause FMQ	22	2.46128	0.1151
FMQ does not Granger Cause TD		4.27297	0.0314
DD does not Granger Cause FMF	22	4.58976	0.0255
FMF does not Granger Cause DD		1.52142	0.2467
SD does not Granger Cause FMF	22	4.67493	0.0241
FMF does not Granger Cause SD		1.24904	0.3118
TD does not Granger Cause FMF	22	4.25723	0.0317
FMF does not Granger Cause TD		0.32660	0.7258
DD does not Granger Cause FRC	23	12.6033	0.0020
FRC does not Granger Cause DD		4.00629	0.0591
SD does not Granger Cause FRC	23	11.4569	0.0029

FRC does not Granger Cause SD		22.1630	0.0001
TD does not Granger Cause FRC	23	2.63101	0.1205
FRC does not Granger Cause TD		0.42194	0.5234
DD does not Granger Cause CPS	22	34.6804	1.E-06
CPS does not Granger Cause DD		2.15985	0.1459
SD does not Granger Cause CPS	22	16.1521	0.0001
CPS does not Granger Cause SD		1.57178	0.2364
TD does not Granger Cause CPS	22	1.40046	0.2735
CPS does not Granger Cause TD		0.31762	0.7321
DD does not Granger Cause CSG	23	7.89079	0.0108
CSG does not Granger Cause DD		0.18679	0.6702
SD does not Granger Cause CSG	23	15.4946	0.0008
CSG does not Granger Cause SD		2.29277	0.1456
TD does not Granger Cause CSG	23	15.9718	0.0007
CSG does not Granger Cause TD		2.39411	0.1375

Source: Author's computation

The estimation test result on the direction of causality in table 4.6 reveal that all the three deposit structure performance indicators- demand deposit, savings deposit, and time deposit display unidirectional causality with credit allocation to agriculture and forestry. The causality flowed from demand deposit to credit allocation to agriculture and forestry, savings deposit displays unidirectional causality with the direction of flow trickling down from savings deposit to credit allocation to agriculture and forestry. Causality also run from time deposit to credit disbursed to agriculture. As such, there is strong causal relationship between deposit structure variables and credit disbursement to agriculture and forestry sector within the limits of our experimental error (at 5% level of significance). The result of the Pairwise test conducted on the first difference of the linear form of the variables show that funds allocated to mining and quarrying proceed changes in demand, savings and time deposit. That is, causality runs uni-directionally from funds allocated to mining to raise the level of demand, savings and time deposits in banks in the Nigerian Economy. The test results also show that causality runs uni-directionally from demand deposit, savings deposit and time deposit to funds disburse to manufacturing and food processing respectively. This causality flow from the explanatory variables to FMF suggesting that bank deposit structure strongly influence credit disbursed to the manufacturing and food processing sector of the Nigerian economy. From the probability value of the F-statistic in the pairwise granger causality test conducted, demand deposit as an independent variable precede credit disburse to real estate and construction. That is, causality flow bi-directionally between demand deposit and increase the credit disburse to real estate and construction in the economy. There also exists bi-directional causal relationship between savings deposit and credit to real estate and construction sector. This suggest that increase in Savings Deposit could help increase the quantum of credit that banks will give to the real estate and construction sector of the economy. In turn, a boost of activities in the real estate and construction sector could stimulate more savings deposit in the economy through the window of savings and investments. Given the probability values of the F-statistic, we observe that there is uni-directional causal relationship between Credit to the Private Sector and two of the explanatory variables- Demand Deposit and Savings Deposit in the model, with Causality flowing from demand deposit to credit to the private sector as well as from savings deposit to credit to the private sector. This suggests that the deposit in demand and savings accounts in banks may be large enough to significantly influence the credit to the private sector. This may be occasioned by high level of awareness and patronage of bank product in Nigeria. The cause-effect test reveal that at a 5% level of significance, causality runs from demand deposit, savings deposit and time deposit to credit disbursed to government sector. Causality flows from demand deposit to CGS. We also observe some pockets of causal relationship between the Savings deposit and CGS as well as between time deposit and CGS. These implies that deposit structure actually impact on the credit disbursed to the government sector in Nigeria.

5.0 Concluding Remarks

This study sets out to investigate the issues relating to the nature, extent and direction of relationship between sectoral credit disbursement and deposit structure indicators of banks in Nigeria. After identifying six different functional sectors- the private, government, agriculture, mining, manufacturing, and construction sectors of the Nigeria economy that could be predicted by various bank deposit structure indicators, we develop six modified deposit structure-credit allocation models to empirically investigate the connectivity between the correlates. The empirical analysis of the yearly Nigerian data for the period 1980 to 2015 is used to estimate the coefficients and

significance of each model. The descriptive statistics tests, and unit root test were performed to evaluate the behaviour of the data series which lend continuity in the modelling process. In addition to the ordinary least square and co-integration techniques which focus on the short-run and long-run analyses respectively, the study employed the Granger causality test to examine the direction of causality between the dependent and independent variables in the models.

The Dickey Fuller test results indicate that all the data achieved stationarity after first differencing at order 1(1). The ordinary least square analysis revealed the existence of positive and significant relationship between demand deposit and credit to mining and quarrying, between time deposit and funds disbursed to real estate and construction as well as between saving deposit and credit allocated to the government sector in Nigeria. In addition, it shows the existence of negative and significant relationship between savings deposit and credit to mining and quarrying as well as between time deposit and credit to the government sector. Using the Johansen Co-integration test, our findings reveal that, but for the components of deposit structure with regard to FMQ, all other deposit structure indicators and sectoral credit disbursement variables are found to be co-integrated, indicating the existence of long run equilibrium relationship between deposit structure indicators and credit disbursement of banks in Nigeria. Employing Pairwise Granger Causality test, it was found that causality runs from demand deposit, savings deposit, and time deposit, to credit disbursed to agriculture and forestry, manufacturing and food processing, private and government sectors of the economy. These are seen as some of the sectors whose credit allocation are influenced by bank deposit structure. In the opposite direction, funds allocated to mining and quarrying Granger-causes changes in demand, savings and time deposits. Again, a bi-directional causality flows between demand savings deposit and credit to real estate and construction in Nigeria.

The results showed evidence of strong connectivity between bank deposit structure and credit disbursement variables in Nigeria. We therefore conclude that there is evidence of impact running both ways from deposit structure to credit disbursement and vice versa. This might be supporting the position that an expanding and active deposit structure can grow the credit disbursement of banks in a country. From the foregoing, the study recommends that bank management should improve on their deposit management strategies in order to create and enhance credit allocation to some preferred productive sectors of the Nigerian economy.

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