CHAPTER ONE
INTRODUCTION

1.1 Background to the Study

Economic growth is the major objective of macroeconomic policies. This is specially so as it relates to the living standards and social welfare of the populace. Therefore, the goal of monetary policy is to provide a stable economic framework which would ensure the necessary prerequisite for economic growth and consequently for economic development (Mera & Pop-Silaghi, 2015). The growth in Gross Domestic Product (GDP) is substantially and closely linked with the performance of real sector of the economy. It is obvious that the performance of the real sector ultimately affects national output and the economy as a whole. An impressive performance of the real sector necessarily increases real GDP, per capita income, generates employment, lowers poverty level and income inequalities as well as promotes the welfare of citizens (CBN, 2014). On the contrary, an abysmal performance of this very important sector summarily brings about economic recession. The economic recession witnessed in Nigeria in 2016 was to some extent attributable to poor performance of the real sector following a persistent fall in crude oil prices in the international oil market (CBN, 2014). The efficacy and success of government's monetary policy through the monetary authority is often evaluated by how well the real sector has performed amidst changes in macroeconomic fundamentals. The CBN (2010) notes that government policies can only be deemed successful if they impact positively on the production and distribution of goods and services. This is based on the

argument that a vibrant and productive real economy creates more linkages in the economy and promotes internal and external balance.

Globalization and integration of financial system has reverberated the importance of emerging markets in the economy of the world. These economies on becoming larger and more integrated into international trade and finance face an increasingly complex set of policy challenges. This, coupled with their important role in the world economy in terms of population and sheer economic size, effectively create a myriad of challenges in their economic, social and political implications even beyond their national borders (Yuosef, 2012). In response to these challenges and consequently mitigating perceived internal and external shocks that would befall the economy, monetary authority extemporary often rely on monetary policy as undeniably one of the venerated tool with awesome potential towards influencing economic activities. To this end, controlling the level of money supply to produce stable price in the economy and low unemployment is anchored on the monetary policy mechanism of the monetary authority which may be contractionary or expansionary. The expansionary monetary policy increases the level of money supply which often fuels inflation. Conversely, the contractionary monetary policy strongly aims to cut down inflation to prevent unwanted distortion, deterioration in the values of assets and ensure the economy returns to equilibrium where demand would equal supply of goods and services.

The tools of monetary policy and their utilization differ among countries and in most cases is based on economic objective that the monetary authority wants to achieve at that point in time and consequent to the prevailing economic condition. The CBN (2014), holds that the specific objective and the focus of monetary policy may change from time to time, depending on the level of economic development and economic fortunes of the country and the choice of instrument to use to achieve what objective would depend on these and other circumstances. The effectiveness of monetary policy relies on the policy-makers' ability to make accurate assessments of the effects of monetary policy on price stability and economic activities, as well as those of the timing of policy implementation (Vinayagathasan, 2013). The Central Bank of Nigeria since its operation in 1959 has adopted the use of various monetary policy tools (reverse requirements, cash reverse ratio and liquidity ratio), minimum rediscount rate (monetary policy rate) and open market operation among others to influence economic variables like price level, employment, national income, savings and investment to spur economic growth and development. However, the implementation of monetary policy by Central Bank of Nigeria has been plagued by a lot of challenges, some of which are within the control of the central bank, while others are completely outside its control consequently making it difficult in realizing target economic goals. Presently (September 2017), interest is as high as 23%, purchasing power of the local currency has been grossly eroded as inflation is over 16% based on the National Bureau of Statistics (NBS) economic report for August, 2017, and economic goal of employment creation has drastically deteriorated given that the unemployment

rate has risen to 14.2% in 2016 compared to 2.7% in 1993. Treasury bills, a financial instrument that is used for open market operations and raising debt for government has grown in volume and value and has become a prominent earning asset for investors and a source of balancing liquidity in the market. Since the CBN Act of 1958, there have been various regimes of monetary policy in Nigeria (tight and loose monetary policy) and these have been used to influence growth and price stability (Apere & Karimo, 2015).

The pace of economic growth in Nigeria has been attributed to instability in government discharge of monetary policy. Going back in time to the 1980s, evidence abounds that considerable level of relationship exists between the Nigerian stock of money and economic progress. The Central Bank of Nigeria being the regulator of the financial system wholly relies on variation on the stock of money as the main policy measure to regulate the economy (Apinran, 2015). Monetary policy aims at ensuring that money supply is at a level that is consistent with the growth target of real income, such that non-inflationary growth will be ensured. Monetary policy is used as inflation is generally considered as purely a monetary phenomenon (Chipote & Makhetha-Kosi, 2014). It is worthy to note however, that the sole reliance by the CBN on controlling the level of money supply as its major monetary policy target has yielded the desired result in terms of pushing the country to financial and economic independence. Nigeria depends on importation for virtually all her needs, while the value of the United States of America Dollar determines the value of the local currency: Naira. Crude oil export accounts for over 90% of Nigeria's foreign exchange, and the demand for forex far exceeds supply, hence frequent depreciation in the exchange rate. To alleviate

the economic cost of these distortions, enduring real exchange rate depreciation raises the relative benefit of investing in the act of second best fashion and tradable activities, which is the main reason why higher economic growth is strongly associated with current era of devaluation of currency because, there exist a unique affiliation between economic growth and the rate of interest, the rate of interest being a crucial determining factor of economic progress in Nigeria (Apinran, 2015).

Monetary policy has lived under many guises as it appears to generally boils down to adjusting the supply of money in the economy to achieve some combination of inflation and output stabilization (Mathai, 2009). Similar to fiscal policy, during period of economic depression, monetary policy is a very critical tool of neutralization. In a recession scenario, individuals will have less to spend on consumption (both local and foreign), production will fall and investment in new projects becomes difficult. In addition, industries may be constrained to retrench workers to cut operational costs and in general, reduction in aggregate demand. Expansionary monetary policy which raises the level of money supply would result in growth in output. Mathai (2009) notes that progression of an economy towards recovery from recession often results in increasing demand which in turn put pressure on input costs, including wages because, workers then use their increased income to buy more goods and services, further bidding up prices and wages and pushing generalized inflation upward - an outcome policymakers usually want to avoid. This is the rationale behind the striking of balance between price stability and growth of output by monetary authorities in the discharge of monetary policy.

Economists differ on the short and long run implication of monetary policy on performance of the real economy. Onderi (2014) while acknowledging Espinosa (1998) asserts that business economists and economic policy-makers share the opinion that short-run effects of monetary policy are very large. On the contrary, their academic counterparts view these effects as rather lame and inconsequential. Furthermore, most business economists and economic policy-makers believe that monetary authority can use its policy tools as often as possible without fear that repetitive use of these tools will lose their short-run effectiveness, contrary to most academic economists who believe that repeated systematic effort to use policy tools to affect the real economic activity will grow less and less effective over time.

1.2 Statement of the Problem

Investigations into the effect of monetary policy on the economy has continued to generate active research interest owing to the fact that the channels through which shocks are transmitted mutates with developments in both global and the domestic economy (CBN, 2014). One of the cardinal problems set out to be resolved by this study non achievement by the monetary authority of set macro-economic goals (single digit inflation target, optimum employment, stable exchange rate and sustainable interest rates) despite significant deployment of varying monetary policies. Price and monetary stability have been the core mandates of the Central Bank of Nigeria's monetary policy.

Aside the macro-economic reality of inefficiency of monetary policy in Nigeria, this study was also motivated by two unsettled disparity on the nexus between monetary policy and real sector of the economy. The first issue

relates to the controversy in theoretical finance literature regarding the motive for holding money and its consequent impact on price.

In addition, the second concern is related to the concentration of empirical studies on the effect of monetary policy on the real sector of the economy as a whole without emphasis on sectorial implication of monetary policy management. From CBN (2014), it is ideal for monetary authorities to weigh the consequences of their macroeconomic management actions on various sectors of the economy owing to the fact that different sectors have different capital intensities that generate different responses in sectorial output from monetary policy. Furthermore, knowledge of the size, timing, and persistence of monetary policy shocks on economic activities (on sectorial bases) provides the monetary authority with vital information required to fine-tune policy initiatives towards stabilizing the macro-economy, and the real sector in particular. Empirical studies across different countries of the world have focused on the real sector of the economy as a whole. A few examples will suffice here. – Ndzinisu (2008) for Swaziland, Mera and Pop-Silaghi (2015) for Romania, Khalid (2005) for Pakistan, Chipote-Makhetha-Kosi (2014) for South Africa, Alavinasab (2016) for Iran and Moser, Pointner and Reitschuler (2006) for Denmark, Sweden and United Kingdom. In the Nigerian environment, the researches of Obadeyi, Okhiria and Afolabi (2016), Adefeso and Mobolaji (2010), Adigwe, Echekoba and Onyeagba (2015), Udude (2014), Onyeiwu (2012) and Njoku and Dike (2016) among others centred on real economy.

Based on online search in the context of Nigeria, apart from the Research Department of Central Bank of Nigeria which conducted a research on effect of monetary policy on disaggregated real economy in 2014 and Nwosa and Saibu (2012), to the best of the researcher's knowledge, there is no other study that have disaggregated the five sectors (agriculture, industry, building and construction, services and whole and retail trade) of the real sector of the economy in an attempt to assess how monetary policy management affects its performance. Ajudua, Ojima and Okonkwo (2015) and Akintunde, Adesope and Okoruwa (2013) dwelt only on agriculture, Ayodeji (2011) and Oyediran (2006) for building and construction, Bakare-Aremu and Osobase (2015) and Imoughele and Ismaila (2014) for industry, while Atarere (2016) and Nto, Mbanasor and Osuala (2012) for wholesale and retail trade. It is the sole aim of this study to ascertain the implication of monetary policy on the performance of the real sector of the Nigerian economy (on sectorial basis) owing to the availability of only two studies CBN (2014) and Nwosa and Saibu (2012) by using up-to-date data (1990-2016) and applying the core monetary policy instruments used by the CBN: cash reserve ratio, monetary policy rate, liquidity ratio and which were omitted in the only two previous studies in Nigeria [CBN (2014) applied only monetary policy rate as monetary policy instrument while Nwosa and Saibu (2012) utilized interest rate, credit to private sector and exchange rate which are completely outside the direct and indirect monetary policy instrument of the Central Bank].

1.3 Objectives of the Study

The main objective of this study is to ascertain the effect of monetary policy on real sector of the economy of Nigeria using disaggregated approach. The specific objectives are stated as:

1. To ascertain the effect of monetary policy rate on agricultural sector output in Nigeria.
2. To determine the effect of liquidity ratio on industrial sector output in Nigeria.
3. To assess the effect of money supply on building and construction sector output in Nigeria.
4. To evaluate the effect of loan to deposit ratio on wholesale and retail sector output in Nigeria.
5. To examine the effect of exchange rate on service output in Nigeria.

1.4 Research Questions

In cautiously following the specific objectives of this study, the following questions were developed to guide the study:

1. To what extent does monetary policy rate affects agricultural sector output in Nigeria?
2. To what level does liquidity ratio affects industrial sector output in Nigeria in Nigeria?
3. To what height does money supply affects building and construction sector output in Nigeria?
4. To what measure has loan to deposit ratio stimulated wholesale and retail sector output in Nigeria?
5. How significant is the effect of exchange rate on service output in Nigeria?

1.5 Research Hypotheses

In line with the objectives and research questions of this study, the following hypotheses in null format were stated:

1. Monetary policy rate has no significant effect on agricultural sector output in Nigeria.
2. Liquidity ratio have no significant effect on industrial sector output in Nigeria.
3. Money supply has no significant effect on building and construction sector output in Nigeria.
4. Loan to deposit ratio has no significant effect on wholesale and retail sector output in Nigeria.
5. Exchange rate has no significant effect on service output in Nigeria.

1.6 Scope of the Study

This study centred on the effect of monetary policy instruments and their effects on real sector of Nigerian economy. The study partly covered the era of direct control (1981 – 1986) and era of market based control (1986 – date). The reforms which accompanied the market based control through the introduction of Open Market Operation (OMO), monetary policy rate, liquidity ratio and cash reserve ratio were studied. The scope of the study was limited to thirty six (36) years owing to the fact there are available data which substantially covered the variables of interest. In addition, the Central Bank of Nigeria has kept a record of the monetary policy utilized over the study's time frame. The real sector of the economy was chosen because it is the sector that measures the level of growth in the economy through real gross domestic product.

1.7 Limitations of the Study

The obvious limitation to this study is on the authenticity of the data as contained in the Central Bank of Nigeria statistical bulletin on 2016 as made available for public consumption on the 28th July, 2017. Whatever error that may be associated with the circumstance surrounding the data generation by the Central Bank of Nigeria is entirely out of control of this research and as such, is unaccounted for. However, this is not to cast a dent on the originality of the data as published by the Central Bank of Nigeria.

1.8 Significance of the Study

The following stakeholders will benefit immensely from the result of this research work:

Central Bank of Nigeria: The result of this research work will bring to the frontier of the Central Bank of Nigeria on how the sectorial components of real sector of the economy are influenced by their monetary management, and this will enable them to strictly fashion out monetary policy that will ensure sustainability in the various sectors for improved real GDP.

Academics/Scholars/Researchers: The debate on the effect of monetary policy on real economy is still ongoing. The result of this research work will explicitly contribute to existing literature on the effect of monetary policy on real sector of the economy based on sectorial disaggregated analysis in the context of Nigeria.

The General Public: The outcome of this research work will assist the general public to vividly understand how the different sectors of the economy have fared by virtue of monetary management of the Central Bank of Nigeria.

Investors and Potential Investors: Investors who invest in different sectors of the real economy will be able to comprehend the ultimate effect of

monetary policy mechanism of the Central Bank of Nigeria and where necessary give feedback to the CBN with regard to the monetary policy channel that is inevitably deterring production. The CBN can in turn amend and implement monetary policy that will in no small measure be of benefit to the different components of the real sector of the economy.

CHAPTER TWO
REVIEW OF RELATED LITERATURE

2.1 Conceptual Review

2.1.1 The Concept of Monetary Policy

The crucial importance of monetary policy at the macroeconomic level has raised the interest of specialists more than half a century ago, giving birth to a broad spectrum of views, dominated by the conviction according to which monetary policy transmission mechanism may be compared with a "black box" (Bernanke & Gertler, as cited in Andries, 2012). Monetary policy has lived under many guises but it generally boils down to adjusting the supply of money in the economy to achieve some combination of inflation and output stabilization. Monetary policy is the controlling of the money supply in an economy by the monetary authority (the Central Bank) through adjustments in interest rate to achieve desired macroeconomic goal. This is to say that monetary policy gives an insight of how the Central Bank manages liquidity in the economy to spur development growth through real output. Conventionally, one of the policy trust of monetary policy in an economy is to guarantee price stability. Monetary Policy refers to the specific actions taken by the Central Bank to regulate the value, supply and cost of money in the economy with a view to achieving government's macroeconomic objectives (CBN, 2016). In the standard models used in policy analysis, monetary policy's effects on the real economy generally derive from frictions that impede the rapid adjustment of the overall average level of prices, such as the fact that it takes time for households and firms to adjust their behaviour in response to changes in the stance of monetary policy (Lacker, 2014).

The adjustment in monetary policy tools of the Central Bank is very influential in real economy development. Take for instance, a cut in the monetary policy rate would results in equivalent reduction in cost of capital through decline in interest rate thus higher productive investments in the economy which correspondingly increase consumption of the citizens. In period of low monetary policy rate regime as envisaged through interest rates cuts, value of securities in the stock market appreciate which attracts more investments in financial assets by individuals and corporate institutions among others. This spurs the revenues of quoted firms through expansion of business operations, and when domestic consumption is high, the value of local currency tends to appreciate relative to foreign currencies as import of goods would be exorbitant. The appreciation in domestic productive economic activities creates employment opportunities, improves income of people employed and raises the standard of living of the populace. Monetary policy rests on the relationship between the rates of interest in an economy, that is the price at which money can be borrowed, and the total supply of money (Yuosef, 2012).

2.1.2 The Real Sector of Nigeria's Economy

The real economy is that sector of the economy that produces goods and services that translates to real output. The productive activities of an economy rest in the real sector which makes it entirely different from other sectors like the financial sector that is concerned with financial transactions. The Central Bank of Nigeria views the real sector of the economy as comprising of households, non-financial organisations and Non-Profit Institutions Serving Households (NPISH) involved in the production and distribution of goods and services (from a combination of factor resources),

necessary to meet the consumption demand of an economy. The real sector in Nigeria is divided into three: primary, secondary and tertiary sector. The primary sector encompasses agricultural and mining activities; secondary sector consists of manufacturing and building & construction activities, while the tertiary sector is made up of services and commerce. In a nutshell, the real sector of Nigeria's economy is constituted by agriculture & mining, manufacturing, building and construction, services and commerce output sectors. Based on the documentation of the Central Bank of Nigeria, the signals pertaining to the choice of goods and services to be produced and distributed in the real sector emanate from two key markets: production factor market and output market. Production factor market deals with raw materials, labour market, land and capital markets, while output market relates to production of agricultural and manufactured goods and general services by business units from factors of production.

The real sector drives economic growth and development, and provides an indication of the living standard of the citizens of an economy and the effectiveness of government's macroeconomic policies. It further facilitates the creation of economic linkages with other sectors and helps in capacity building, employment and income generation. Global Alliance for Banking and Values (2015) asserts that a sustainable real sector requires enterprises and individuals that emphasizes people before profit while focusing their resources on initiatives that result in economic resilience, environmental regeneration and social empowerment for the community and the people they serve. The sector is one of the sectors that is capable, if vibrant, of fast-tracking economic growth and development coupled with high level of massive employment

creation. However, financing the sector has been a major challenge considering the slow pace of growth in the financial sector which is further aggravated by the incessant money market (banks) collapses, caused by the malfeasance of corporate insiders (Ibadin, Moni & Eikhomun, 2014). Sanusi (2011) notes that the real economy is important for a lot of reasons. Firstly, the sector produces and distributes the tangible goods and services required to satisfy aggregate demand in the economy. Its performance is a gauge or an indirect measure of the standard of living of the populace. Secondly, the performance of the sector can be used to assess the effectiveness of macroeconomic policies. Government policies can only be adjudged successful if they impact positively on the production and distribution of goods and services thereby impacting positively on the welfare of the citizenry. Thirdly, a vibrant real sector, particularly the agricultural and manufacturing sub-sectors create more linkages in the economy than any other sector and thus would reduce the economic pressures on the external sector. Finally, the relevance of the real sector is also manifested in its capacity building role, as well as in its high employment and income generating potentials.

2.1.3 Monetary Policy in Nigeria

The current monetary policy of the Central Bank of Nigeria is carefully hinged on realization of price and exchange rate stability. The Central Bank of Nigeria's price targeting and exchange rate stability motives cannot be over-emphasized in the sense that in an emerging economy such as Nigeria, stability in exchange rate and low inflation rate is a "sine qua non" to sustaining economic growth. This is in addition to hedging the economy against internal and external shocks associated with linkage to the

international financial markets. Prior to the introduction of Structural Adjustment Programme (SAP) in 1986, monetary policy of the Central Bank of Nigeria was targeted towards attainment of internal and external balance of payment through direct monetary control. This stance however shifted to market mechanism starting from 1986, with the instruments utilized for monetary policy similarly changing over the years. In other words, the direct era (pre SAP) and indirect era (post SAP) are the two separate phases on monetary policy conduct in Nigeria.

It is apparent from the foregoing that the conduct of monetary policy over the years has gone through major changes. During the early years of independence (1961-64), which coincided with the period for the second development plan, monetary policy actions were focused on the establishment of a strong financial base and the promotion of domestic financial infrastructure, such as the money and capital market institutions (CBN, 2014). The consistent allocation of financial resources to sectors that have high potentials to contributing towards economic growth characterized this period. The argument by the monetary authority was that the priority need of the citizenry must be kept in focus and responded to convincingly in order to better their welfare and accelerate the pace of growth and development. It was documented that the Central Bank of Nigeria was reaped in 1962 to enable the government access fund at lowest cost available to finance the Second National Development Plan.

The hardship and lack of productivity that characterised the post-civil war era necessitated a substantial increment in workers' salaries and wages in 1971 and 1974 by the Adebo and Udoji commissions respectively. These,

however, came at a significant cost of heightened inflation which the monetary authority in an attempt to check, encouraged Deposit Money Banks to allocate available credit to productive sectors to revive the economy. The direct monetary policy style of the Central Bank of Nigeria came to an end in 1992 giving way to indirect control following the financial liberalization of the economy. The indirect monetary policy relied on intermediate targets to influence the ultimate objective of policy and saw the introduction of various several other policy instruments such as the minimum rediscount rate (MRR) otherwise called monetary policy rate (CBN, 2014). Nevertheless, the aim of the direct and indirect monetary control was to ensure mobilization and allocation of funds from surplus to deficit units of the economy to spur growth and development. The introduction of Open Market Operation in 1993 as a tool of monetary policy to engender adequate growth in money supply without necessarily resulting to inflation was adjudged as welcomed development.

During the period 2008 – 2011, the monetary authority was overwhelmed by the need to ensure sustainability in money supply to influence gross domestic product considering uncertainties in macroeconomic environment, financial stability, exchange rate stability and interest rate. Despite the monetary policy goals set then, the global financial crisis that started in the United States of America (USA) and eventually spreading to other stock market of the world {including Nigerian Stock Exchange (NSE)} dealt a big blow to the realization of these goals. The banking system was affected by the global financial crisis following disinvestments by foreign investors resulting in massive capital outflows and pressure on exchange rate amidst dwindling external reserve and falling oil prices in the international oil

market. The Central Bank of Nigeria reports that in the wake of the global financial crisis, it largely adopted the policy of monetary easing to address the problem of liquidity shortages in the banking system from September 2008 to September 2010. The monetary policy easing measures taken during the period include progressive reduction of monetary policy rate from 10.25% to 6.0%, reduction of cash reserve requirement from 4.0% to 2% and 1% and reduction of liquidity ratio from 40% to 30% and 25% among other measures. On restoration of stability and re-emergence of liquidity surfeit in the banking system, the CBN adopted a tightening stance from September 2010 to December 2011 vis-a-viz increasing monetary policy rate from 6% to 12%, cash reserve requirement from 1% to 2% , 4% and eventually to 8% as well as liquidity ratio from 25% to 30%.

2.1.4 Instruments of Monetary Policy in Nigeria

Monetary policy instruments varies from country to country depending on the level of development but the aim is the same. The monetary policy instrument in Nigeria as documented and discussed by the Central Bank of Nigeria in its "Understanding Monetary Policy" Series No 3 of 2011 include:

Reserve Requirements: This instrument is used by the Central Bank to influence the level of bank reserves and hence, their ability to grant loans. Reserve requirements are lowered in order to free reserves for banks to grant loans and thereby increase money supply in the economy. On the other hand, they are raised in order to reduce the capacity of banks to provide loans thereby reducing money supply in the economy.

Open Market Operation: The most important and flexible tool of monetary policy is open market operations. It is the buying and selling of government securities in the open market (primary or secondary) in order to control the

amount of money in the banking system. The CBN by purchasing securities, the central bank injects money into the banking system and stimulates growth whereas by selling securities it absorbs excess money. Thus, in the event of excess liquidity in the system, the CBN will sell government securities (e.g. Treasury Bills) in a bid to reduce the money supply. On the other hand however, during liquidity shortages, the CBN buys government securities so as to increase money supply. Instruments commonly used for this purpose include treasury bills, central bank bills, or prime commercial paper.

Monetary Policy Rate: This instrument is a medium provided by the CBN which enables the DMBs to borrow reserves against collaterals in form of government or other acceptable securities. The central bank operates this facility in accordance with its role as lender of last resort and transactions are conducted in form of short term (usually overnight) loans. The central bank lends to financially sound DMBs at the policy rate. This rate sets the floor for the interest rate regime in the money market (the nominal anchor rate) and thereby affects the supply of credit, the supply of savings (which in turn affects the supply of reserves and monetary aggregate) and the supply of investment (which affects employment and GDP).

Exchange Rate: The balance of payments can be in deficit or in surplus and this can affect the monetary base, hence the money supply, in one direction or the other. By selling or buying foreign currencies (especially the US$), the central bank ensures that the exchange rate is at an optimal level. The real exchange rate when misaligned affects the current account balance because of its impact on external competitiveness.

Prudential Guidelines: The CBN may require DMBs to observe certain prescribed rules in their credit operations in order to achieve specified outcomes. Key elements of prudential guidelines remove some discretion from bank management and replace them with rules.

Moral Suasion: The central bank issues licenses to DMBs and regulates the operation of the banking system. Thus, it can persuade banks to follow certain policies such as credit restraint or expansion, increasing savings mobilization and promoting exports through financial support, which the DMBs will ordinarily not undertake on the basis of their risk/return assessment alone.

2.1.5 Strategies of Monetary Policy Targeting in Nigeria

2.1.5.1 Monetary Targeting

Monetary targeting has to do with controlling money supply for long term goal price stability. In instances where economic growth and development is prone to inflationary tendencies, monetary targeting appears to be the core goal of monetary policy through close surveillance on monetary aggregates. If the monetary aggregates were growing too quickly, it could trigger inflationary pressures (more money chasing after the same amount of goods and services leading to rising prices) and constrains the CBN to raise interest rates or otherwise halt growth in money-supply (CBN, 2011). A monetary targeting strategy comprises three elements: reliance on information conveyed by a monetary aggregate to conduct monetary policy, announcement of targets for monetary aggregates, and some accountability mechanism to preclude large and systematic deviations from the monetary targets (Mishkin, 2000).

2.1.5.2 Inflation Targeting

Inflation targeting involves setting of inflation rate by the CBN and adjusting monetary policy tools to achieving that target. According to Svensson (2010),

inflation targeting involves prescription of a numerical inflation target followed by implementation of monetary policies that accentuate inflation forecast (forecast targeting) and a high degree of transparency and accountability. The thrust of inflation targeting is to ensure price stability and deter encroachment in the purchasing power of money. Regarding monetary target, recent policy indication shows that the CBN may have relaxed in its pursuit of full-fledged inflation targeting for the country (Bassey & Essien, 2014). Inflation targeting of the CBN has recorded success in the past decades but the global financial crisis which stared in 2007 in USA casted a dent to its efficacy. During the global crisis, DMBs were faced with liquidity constraints to the point that the monetary policy rate was reduced to 6% from 12% to enhance flow of liquidity in the economy. Anaeto (2016) indicated that the full-fledged inflation targeting framework may not be very relevant in the prevailing economic dispensation, popularly called the new normal, as it may not address the exchange rate and foreign reserves variability, economic growth as well as employment objectives of the Nigerian economy.

2.1.5.3 Price Level Targeting

Information that will enable assessment of the performance of price level targeting is scant in literature. However, the Swedish experiment of targeting price stability during the 1930s remains the only attempt at targeting price level over a prolonged period of time (Guender & Oh, 2005). Price level targeting is a monetary approach that involves the lowering or raising of interest rate to ensure stability in prices of goods and services from year to year. In this framework, the CBN tries to maintain price within a set range rather than targeting a particular inflation rate. Following price level targeting, the monetary authority aims to keep price levels in check or maintain a path

that would increase at steady rate over time, let say, 1% per fiscal year. Price level targeting is often said to imply more short-run inflation variability and thereby more employment variability than inflation targeting and counter to this conventional wisdom, under discretion a price level target results in lower inflation variability than an inflation target if unemployment is at least moderately persistent (Svensson, 1996). As shown by Pedersen (2010) when there is no persistence in cost-push shocks, then it is possible to perfectly replicate the optimal commitment solution by assigning a price level target to the central bank, and how price level targeting presents a way of keeping the conventional interest rate operating procedure effective, when the zero lower bound binds.

2.1.5.4 Exchange Rate Targeting

Exchange rate targeting involves the fixing of exchange rate of domestic currency in relation to other countries' currencies. The exchange rate targeting is usually seen as a means of facilitating trade between countries. This would be ideal for emerging economies which relies mostly on exports of commodities to earn foreign exchange. Despite exchange rate targeting ability to check inflation and currency volatility in exchange rate, it has some weaknesses. As documented by Petursson (2000), firstly, it deprives the central bank of its ability to use monetary policy to respond to domestic idiosyncratic shocks. Secondly, countries with fixed exchange rate regimes become prone to speculation against their currencies. Thirdly, a fixed exchange rate policy can reduce the flow of information. Finally, a fixed exchange rate policy can increase the likelihood of a financial crisis if the bulk of domestic liabilities are of short duration or are denominated in foreign currency, as is common among countries with underdeveloped financial

markets or a history of high inflation. Using an optimizing model of a small open economy, Uribe (2002) studied the macroeconomic effects of purchasing power parity rules whereby the government increases the devaluation rate when the real exchange rate (defined as the price of tradables in terms of non-tradables) is below its long-run level and reduces the devaluation rate when the real exchange rate is above its long-run level. The result shows that the mere existence of such a rule can generate aggregate fluctuations due to self-fulfilling revisions in expectations.

2.1.6 Monetary Policy Transmission Mechanism

Monetary policy transmission mechanism refers to the channels through which the effect of adjustments of monetary policy instruments of the Central Bank affects the economy through production and prices. Monetary policy transmission mechanism details the process which the monetary policy decisions are passed to the economy through the financial system super structures. Monetary policy transmission mechanism describe how policy induced changes in the nominal stock of money or the short term nominal interest rate affect real variables such as aggregate output and employment (Ireland, 2015). The decision of the Central Bank with respect to monetary policy rate, cash reserve ratio, open market operation and liquidity ratio among others influence overall economic condition and welfare of the people. The four basic channels of monetary policy transmission are succinctly discussed in subsequent sub-headings.

2.1.6.1 Interest Rate Channel

The interest rate channel is the traditional transmission mechanism of monetary policy in the economy. The interest rate channel appears too superior relative to other channels like assets price and exchange rate because

of the tremendous effect of interest rate in cost of capital for production. The interest channel is viewed conventionally from the Investment Savings – Liquidity preference Money supply (IS-LM) model which graphically shows the relationship between interest rate and output. IS-LM model holds that monetary policy operates through the liability side of the balance sheets: giving some degree of price stickiness. A change in money is transmitted to the real economy through its impact on the cost of capital and consumption (Abdullahi, 2014). Injection of liquidity is injected into the financial system, it can raises the expected price level and hence expected inflation, thereby lowering the real interest rate. Households consequently seize the opportunity of lower real interest rates to increase investment in consumer durables, such as automobiles or refrigerators or resident housing, while firms also take on investment projects with lower rates of return and step up hiring and training of new workers (Herbertsson & Hall, 2003).

Kovanen (2011) analysed interest rate pass-through in Ghana. Time series and bank-specific data were utilized to highlight linkages between policies, wholesale market, and retail market interest rates. The results of the analysis shows that responses to changes in the policy interest rate are gradual in the wholesale market. Prolonged deviation in the interbank interest rate from the prime rate illustrate the challenges the Bank of Ghana faces when targeting a short-term money market interest rate. Asymmetries in the wholesale market adjustment possibly relate to monetary policy signalling, weak policy credibility, and liquidity management. In the retail market, pass-through to deposit and lending interest rates is protracted and incomplete. Gitonga (2015) investigated the impact of interest rate channel of monetary

transmission mechanism in executing monetary policies in Kenya, during the period 2005-2013. The study employed a Vector AutoRegression (VAR) methodology using impulse response graphs and variance decomposition to test the relative impact of the different variables tested being repo rate,NEER,M3, CPI, GDP and savings, which data sets were quarterly. The empirical analysis found that with exception of innovation (M3), there exists significant influence of interest rate channel of monetary transmission shock to GDP and CPI, although weak and a strong significant influence on NEER. Wulandari (2012) assessed the important role of two monetary transmission mechanism channels in managing inflation and contributing to economic growth, by employing Structural Vector Autoregression (SVAR) model. The monetary transmission channels are interest rate channel and credit-bank lending channel. The model is then solved by implementing forecasting error variance decomposition to investigate the contribution of each variables to both inflation and economic growth. It was shown that interest rate channel plays important role in monetary transmission mechanism for maintaining inflation but has limited role in the economic growth. In the other hand, credit-bank lending channel can effectively affect economic growth.

2.1.6.2 Credit Channel

Theoretically, credit or the bank lending channel entails a situation where the CBN's monetary policy affects the magnitude of funds that DMBs lend to firms and individuals and which eventually affects the real sector of the economy. Under this channel, monetary policy works by Central Banks prescription of liquidity ratio and loan to deposit ratio which affects DMBs' assets and liabilities. An expansionary monetary policy through reduction in liquidity ratio and loan to deposit ratio increases the magnitude of money the

banks can lend to economic agents. The reliance and availability of bank capital attracts investments in productive segments which propels the real sector of the economy. As noted by CBN (2016), two key conditions are necessary for a lending channel to operate are: (i) inability of DMBs to shield their loan portfolios from changes in monetary policy; and (ii) inability of Borrowers to fully insulate their real spending from changes in the availability of bank credit. The credit aspects of the monetary policy transmission mechanism particularly in the balance sheet channel are critical in any monetary policy initiatives because it focuses on the role of financial intermediaries and the critical role of banks as opposed to just the use of interest rates in managing overall economic activity (Farajnezhad, Ziaei, Choo & Karimiyan, 2016).

Markidou and Nikolaidou (2007) ascertained the relevance of the credit channel of monetary policy transmission in Greece by employing a SVAR model on both aggregated and disaggregated data and estimating the response of bank loans to different macroeconomic shocks. By distinguishing between households and firms instead of focusing on the response of total bank credit (heterogeneity of the loan types) to a tightening monetary policy shock and by employing a SVAR methodology using monthly data, the study identified structural models to study bank credit in Greece as a source of macroeconomic variation for the period 1995-2005. The findings suggested that the credit channel in Greece for the period 1995-2005 is inoperative in spite of the two monetary policy variables used, the monetary base and the interest rate. The responses of the different bank credit measures to monetary policy changes do not significantly differ, rendering the credit channel

ineffective for both consumers and business firms. Carrera (2011) identified the bank lending channel (using bank level data), and tested its relevance for understanding the transmission to economic activity by comparing monetary policy effects under two scenarios with and without a bank lending channel operating (using structural autoregressive vectors.) The study considered a sample period in which a policy variable can capture the monetary policy stance of the central bank. For the case of Peru, it was found that the bank lending channel has operated but this channel is not important for identifying the transmission process from monetary policy to macroeconomic activity.

2.1.6.3 Assets Price Channel

Asset prices, though not a goal or instrument of monetary policy, are nonetheless important for its realization, since they are a component of its transmission mechanism (Gantnerova, 2004). Assets price channel of monetary policy transmission propagates the effect of monetary policy decisions of the Central Bank on prices of securities in the stock market. An upward shift in monetary policy rate increases interest rate/cost of capital in the economy which affects the values of securities quoted on the stock exchange. That aside, revenues of quoted firms would decline, while operational cost will rise. This may force some firms to lay off some of their workers as a means of cutting cost. Speedy development of financial systems, the phenomenon of the so-called financial innovations (derivatives, securitisation) and a growing degree of liberalisation of international financial transactions increase the importance of the asset price channel and the activity of asymmetric information in the monetary transmission mechanism. Thus the transmission of liquidity through the financial system and the economy

partially changes, as well as the initial and feedback monetary effects on the movement of consumer prices and asset prices (Ivanov & Lovrinovic, 2009).

Mishkin (2001) surveyed the transmission mechanisms of monetary policy beyond the standard interest rate channel by focusing on how monetary policy affects the economy through other asset prices. It outlined how the monetary transmission mechanisms operating through stock prices, real estate prices, and exchange rates affect which affect investment and consumption decisions of both firms and households. Given the role that asset prices play on the transmission mechanism, central banks have been often tempted to use them as targets of monetary policy. The findings from the study showed that despite the significance of asset prices in the conduct of monetary policy, targeting asset prices by central banks is likely to lead to worse economic outcomes and might even erode the support for their independence.

2.1.6.4 Exchange Rate Channel

The exchange rate transmission details the effects of monetary policy adjustments on price and output through exchange rate. Exchange rate channel constitutes an important monetary policy variable through which monetary policy decisions of the Central Bank is transmitted to the real sector of the economy. This is because of its effect on value of local currency, inflation, external sector, credibility in macroeconomic fundamentals, capital flows and stability in the financial system. Frequent fluctuation in exchange rate may fuel or check inflationary tendency provided that foreign goods are consumed by citizens. When the exchange rate is sustainable and devoid of unwarranted variation, domestic consumptions become cheaper, while imported goods become expensive. Increased demand for domestic goods and services spurs production and leads to growth in real output. In this way, monetary policy

transmission through exchange rate is said to affect the real sector of the economy. Relying on the portfolio and expectations channel theory, CBN (2011) stated that under a floating exchange rate regime, wealth portfolios include both domestic and foreign assets, and as the supply of money increases, a portfolio adjustment takes place, resulting in a higher demand for foreign assets, which will depreciates the exchange rate of domestic currency and hence the value of the domestic assets. Furthermore, additional real effects of a policy-induced increase in the short term interest rate come about when the domestic nominal interest rate rises above its foreign counterparts, equilibrium in the foreign exchange market requires that the domestic currency gradually depreciates at a rate that, again, serves to equate the risk-adjusted returns on various debt instruments, in this case, of markets for financial assets and durable goods.

The exchange rate is one of the intermediate policy variables through which monetary policy is transmitted to the larger economy through its impact on the value of domestic currency, domestic inflation (the pass-through effect), the external sector, macroeconomic credibility, capital flows, and financial stability. Thus, changes in the exchange rate might induce changes in the relative prices of goods and services, and the level of spending by individuals and firms, especially if significant levels of their wealth are held in foreign currencies. Gumata, Kabundiz and Ndou (2013) explored the different channels of transmission of monetary policy shock in South Africa in a data-rich environment. The analysis contains 165 quarterly variables observed from 1990Q1 to 2012Q2. Large Bayesian Vector Autoregressive model, which can easily accommodate a large cross-section of variables without running out of

degree of freedom was utilized. The model includes five channels of transmission: credit, interest rate, asset prices, exchange rate, and expectations. The results showed that all channels seem potent, but their magnitudes and importance differ. The results indicated that the interest rate channel is the most important transmitter of the shock, followed by the exchange rate, expectation, and credit channels.

In the same vain, Nunkoo-Gonpot, Sookia and Allybokus (2011) focused on the study of two channels: the interest rate and the exchange rate channels. A fourth order Vector Autoregressive (VAR) model of money, interest rates, exchange rates, output and price, based on quarterly data from the year 1985 to 2006 was used. Granger Causality tests show that none of the variables in the VAR model is exogenous, whilst impulse response analyses and forecast error variance decompositions point to the significance of monetary policy in the short term. In addition, the response of output and price level to interest rate and exchange rate shocks identify both channels as significant means of monetary transmission in Mauritius, with the interest rate channel being more potent in transmitting the changes to the output of the economy. Cevik and Teksoz (2012) empirically evaluated the effectiveness of monetary policy transmission in the Gulf Cooperation Council (GCC) countries using a structural vector autoregressive model. The results indicated that the interest rate and bank lending channels are relatively effective in influencing non-hydrocarbon output and consumer prices, while the exchange rate channel does not appear to play an important role as a monetary transmission mechanism because of the pegged exchange rate regimes. The empirical analysis suggested that policy measures and structural reforms—

strengthening financial intermediation and facilitating the development of liquid domestic capital markets—would advance the effectiveness of monetary transmission mechanisms in the GCC countries.

2.1.7 How Monetary Policy Affects the Real Economy

The ultimate objective of monetary policy is to promote sound economic performance and high living standards of the citizenry. These give citizens confidence in a country's currency as a store of value, unit of account and medium of exchange, enabling them to make sound economic and financial decisions. There are diverse ways in which monetary policy impacts the wellbeing of individuals depending on the policy thrust at a point in time. One of the ways is its influence on the cost and availability of credit. An expansionary monetary policy reduces the cost of credit and thus, boosts investments. This would in turn increase output and employment and ultimately citizenry's wellbeing. The reverse also holds when monetary authorities seek to pursue a restrictive monetary policy. The choice of the direction of monetary policy is contingent on prevailing economic and monetary conditions. Consequently, during a period of economic boom, the authorities could decide on non-accommodating monetary policy, by implementing policies that would reduce the growth in money supply. The converse takes place when the authorities want to boost economic activities. In such situation, monetary authorities will pursue monetary policies that are aimed at increasing the supply of money to the economy for growth and development. Economic agents are thus motivated to borrow more money for investments or personal consumption. This will in turn increase the demand and supply of goods and services which will ultimately make producers to employ more people or machines to produce more goods and services to meet

the increased levels of aggregate demand and eventually, higher levels of employment would be achieved in the economy.

Monetary policy also impacts the lives of individuals owing to the influence of money supply on the allocation of resources in the economy. Money supply in an economy can be controlled if the monetary authority observes that the supply of money is growing faster than the economy‘s capacity to produce goods and services. If the monetary authority does not intervene to control the growth in money supply under the circumstance, it will lead to demand pull inflation. This is a signal that the amount of money in circulation is more than what the current volume of goods and services produced could optimally accommodate, and this is likely to be inflationary (CBN, 2011). In the event that money supply is not controlled, economic agents would be discouraged from planning and further investing as they will consider their investments not to be secure. This is because when there is inflation, the value of investments and currency holdings would be eroded. Rising inflation rate makes economic and financial environments unpredictable. Monetary policy also gauges the expectation of the markets about future prices. Investors in the financial markets will normally be apprehensive should they perceive that the central bank is not focused on containing inflation. To compensate for this, they will usually add a risk premium to long-term rates making the rates higher. This implies the market expectation about monetary policy direction in the future does have a substantial impact on long-term interest rates. The monetary authorities try to address market expectations through a policy of moving gradually once they

start changing interest rates or by disclosing the stance of policy in the foreseeable future.

Policy-induced changes in real interest rates affect the public‘s demand for goods and services mainly through changes in borrowing costs, the availability of bank loans, and the wealth of households to purchase durable goods. A decrease in real interest rates lowers the cost of borrowing, which leads businesses to increase their level of investment spending thereby resulting in households buying more durable goods. Lower real interest rates and a stable macroeconomic policy environment may increase banks’ willingness to lend to businesses and households. This may increase spending especially by smaller borrowers who have limited access to credits, other than from banks. Lower real interest rates also make common stocks and related investments more attractive than bonds and other debt instruments leading to a rise in stock prices. Households with stocks in their portfolios find that the value of their holdings is higher and the resultant increase in wealth makes them willing to spend more. Higher stock prices also make it more attractive for businesses to invest in plants and equipment by issuing stocks (CBN, 2011).

2.2 Theoretical Framework

Theories have been modelled in the literature in the discourse of the alleged nexus between monetary policy and real sector of the economy. The influence of changes in monetary policy on the real sector of the economy is viewed majorly from three theoretical consideration: Classical Quantity Theory of Money, Keynesian and monetarist accord. These theories were reviewed to provide a sound theoretical background to this study.

2.2.1 Classical Quantity Theory of Money

The theory was first developed by Jean Bodin in 1958 but later refined by Irving Fisher in 1911 (Jhingan as cited in Onderi, 2014). The classical economists view money as a medium of exchange. To them, people hold money only for transactional purposes. All versions of the quantity theory of money demonstrate that there is a strong link between .money and the price levels. The theory seeks to establish an exact relationship between money and price ceteris paribus. Classists describe money as veil and its impact on the overall economy is neutral, having effect only on price level. In the event that money supply increases then interest rate, real income and general level of real economic activities remain unaffected as the price level increase proportionately (Apinran, 2015). According to Smitha (2010), the classical economists did not explicitly formulate demand for money theory but their views are inherent in the quantity theory of money. They emphasized the transactions demand for money in terms of the velocity of circulation of money because money acts as a medium of exchange and facilitates the exchange of goods and services. The Fisher's equation is stated as:

$$MV = PT \quad \ldots\ldots 2.1$$

Where M represents the quantity of money in circulation, V is the number of times a unit of money is used in transaction per unit of time, P is the weighted average of all individual prices and T is the total amount of goods and services exchanged for money, PT represents the demand for money and MV represents the supply of money. The transactions demand for money, is determined by the level of full employment income because the classical economists believed in Say‘s Law whereby supply created its own demand, assuming the full employment level of income (Smitha, 2010). They affirm

that the event of downward rigidity of money wage can result in unemployment, and given the velocity of money and output level, if the Central Bank raises the stock of money, the increase in liquidity as a result of this will automatically increase the demand for goods and services which also raises the general price level (Apinran, 2015). Fisher's quantity theory of money faced some criticism from Keynes. These include lack of theoretical value, constant velocity, truism, unrealistic assumption, neglect of the asset function and store of value function, multiplication of two non-compatible factors (M and V), lack of an explanation on how change in 'M' changes' P', and finally its being a static theory based on assumptions (Jhingan as cited in Onderi, 2014).

2.2.2 Cambridge Quantity Theory of Money

The Cambridge quantity theory of money also known as the neoclassical or cash balance approach quantity theory of money was pioneered by Alfred Marshall in 1917. The theory posits that individuals hold money for transaction purposes, however, some may be held for security and for meeting unexpected obligations. Neoclassical economists hypothesized that income earners strike a balance between the convenience and security that money provides and the loss of income resulting from money holding (Onderi, 2014). The Cambridge quantity theory of money is modelled as follows:

$M^d = kPQ$ ……..2.2

Where M^d is the demand for money, P is the price, ' is the real income and 'k' is the proportion of income held as currency and bank deposits. The Cambridge quantity theory of money links prices to the demand for money and not the supply of money since idle cash balance does not in reality create

demand and affect prices. Several economists including Don Patinkin and J.M. Keynes criticized the cash balance approach of neglecting the real balance effects that is integrating the commodity and money market, assumption of unity in elastic demand for money, neglect of speculative demand for money and neglect of interest rate (Jhingan, 1997 as cited in Onderi, 2014)

2.2.3 Keynesian Monetary Theory

The Keynesian theory of money is seen as an extension of the Cambridge quantity theory of money in the sense that it incorporates holding of bonds and securities as an alternative to holding idle cash balance as an asset. Keynes' theory links the demand for money to the variations in the interest rate, thus introducing speculative demand for money that arises due to uncertainty about interest fluctuations. Consequently, holding money for the purpose of buying bonds in the future on the expectation that bond prices will drop is essentially a speculative demand for money (Onderi, 2014). The Keynesian theory of money is a theory of the actual workings of a money economy (Smitha, 2010). Keynes maintains that economic activities are largely effected by the key role exercised by monetary policy in an economy. He postulates that interest rate, aggregate demand, level of employment, output and income are sensitive to change in the money supply .Aggregate supply function, fairly price –interest with perfect competitive market and close economy are some of the assumptions of Keynesian model.

Smitha (2010) notes that in the entire Keynesian system, there are two situations in which money is neutral. The first is the situation of full employment and the second is the special case of liquidity trap. Keynes visualized conditions in which the speculative demand for money would be highly or even totally elastic so that changes in the quantity of money would

be fully absorbed into speculative balances. Keynesian monetary theory argues that demand for money is negatively related to nominal interest which is a significant departure from the classical quantity theory of money but, less departure from the Cambridge approach which did not rule out such a relationship (Dwivedi as cited in Onderi, 2014). The theory is practically based on one idea of price rigidity and economy possibly working or performing below full employment, level of output, employment, and income and emphasized the issue of output rather than price as a function of variation in economic conditions (Apinran, 2015). Having reviewed the classical quantity theory of money and the Cambridge theory of money, it is pertinent to state here that this study is anchored on Keynesian monetary theory. This is based on the argument that Nigeria is an emerging economy and lacks adequate financial resources to command accelerated growth and development.

2.2.4. Relevance of Keynesian Monetary Theory as the Theoretical Framework of this Research Work

As earlier stated, the Keynesian monetary theory forms the theoretical basis for which this study was pursued. The theory posits that individuals not only hold money for transaction but also for investments in assets (such as bond) to avoid variation that may arise from interest rate instability. Nigeria is an emerging economy and lacks adequate financial resources to command accelerated growth and development due to the developing nature of the financial system, especially the stock market. Relying on the assumption of the Keynesian monetary theory, when individuals invest idle fund, resources are mobilized from surplus units and channelled to deficit units which spurs real output. Profits from investments improves the welfare of the people and

the resultant effect is increased consumption of desired goods and services. The rise in consumption ultimately results in increased domestic production which is well matched by the activities of the real sector. Sequel to the upbeat in domestic consumption, the real sector of the economy will witness sustained growth hence, justification for Keynesian monetary theory as theoretical hinge point of this study.

2.3 Empirical Review

2.3.1 Monetary Policy and Real Sector of the Economy

Adigwe, Echekoba and Onyeagba (2015) analysed the impact of monetary policy on the Nigerian economy. In doing this, the Ordinary Least Square Method (OLS) was used to analyse the data between 1980 and 2010. The result of the analysis shows that monetary policy represented by money supply exerts a positive impact on GDP growth but negative impact on the rate of inflation. Furthermore, Obadeyi, Okhiria and Afolabi (2016) evaluated the impact of monetary policy on the growth of emerging economy. The study covered the period between 1990 and 2012. Automated Statistical Package Technique (ASPT) was used to analyse the model. The Ordinary Least Square (OLS) technique was adopted in the study in order to assess the relationship among the economic variables. The study showed that interest rate, money supply and exchange rate will automatically assist in the mobilization and utilization process of financial resources to achieve a desired national economic growth, but the administration of monetary policy structure is weak in Nigeria. Falade and Folorunso (2015) examined the relative effectiveness of fiscal and monetary policy instruments on economic growth sustainability in Nigeria in order to determine the appropriate mix of both policies. The paper employed error correction mechanism, Johansen cointegration test among the

series using annual data for the period 1970-2013. Data were sourced mainly from Statistical Bulletin published by the Central Bank Nigeria. The result suggested that there is a long run relationship among fiscal and monetary variables and economic growth. The paper, however, found that the current level of exchange rate and its immediate past level, domestic interest rate, current level of government revenue and current level of money supply are the appropriate policy instrument mix in promoting economic growth both in the short and long run.

Saqib and Aggarwal (2017) ascertained the comparative effect of fiscal and monetary policy on economic growth in Pakistan using annual time series data from 1984 to 2014. The cointegrtion result suggested that both monetary and fiscal policy have significant and positive effect on economic growth. The coefficient of monetary policy is much greater than fiscal policy which implies that monetary policy has more concerned with economic growth than fiscal policy in Pakistan. Ahmad, Afzal and Ghani (2016) explored importance of monetary measures in promoting economic growth of Pakistan. The study obtained annual time-series data covering the range of 1973 to 2014, employing Augmented Dickey-Fuller (ADF) unit root test to measure stationary of variables. Gross domestic product, Money supply, Inflation and Interest rate are stationary at level while exchange rate measured stationary at first difference. Autoregressive Distribution Lag (ARDL) Cointegration approach applied to distinguish the robust among the variables with specification of short-run and longrun. Empirical findings mentioned long-run association occurs among variables, money supply and exchange rate, which positively influence economic growth. Inflation positively while insignificance

and interest rate negatively affect economic growth. Chipote and Makhetha-Kosi (2014) determined the role played by monetary policy in promoting economic growth in the South African economy over the period 2000-2010. The study employed the Augmented Dickey-Fuller and Phillips Perron unit root tests to test for stationarity in the time series. The Johansen co-integration and the Error Correction Mechanism were employed to identify the long-run and short-run dynamics among the variables. The study showed that a long run relationship exists among the variables. Also, the core finding of this study showed that money supply, repo rate and exchange rate are insignificant monetary policy instruments that drive growth in South Africa whilst inflation is significant.

Gul, Mughal and Rahim (2012) presented a review that how the decisions of monetary authorities influence the macro variables like GDP, money supply, interest rates, exchange rates and inflation in Pakistan. The method of least square OLS explains the relationship between the variables under study. Tight monetary policy with balanced adjustments in independent variables showed a positive relationship with dependent variable. Alavinasab (2016) assessed the impact of monetary policy on economic growth in Iran over the period 1971-2011. The findings of regression analysis showed that in the long run, economic growth has found to be significantly influenced by money supply, exchange rate and inflation rate. In short run, the results of estimated Error-correction model indicated that money supply and exchange rate significantly impact on economic growth. Using the autoregressive distributed lag (ARDL) bounds testing approach Twinoburyo and Odhiambo (2016) evaluated the short-run and long-run impact of monetary policy on

economic growth in Kenya for the period 1973 to 2013. The paper used both the broad money supply and the 3-month Treasury bill rate as proxies of monetary policy. Both short-run and long-run empirical results supported monetary policy neutrality, implying that monetary policy has no effect on economic growth – both in the short run and in the long run.

Ndzinisa (2008) specified and estimated three equations linking monetary policy variables with economic growth to determine the efficacy of monetary policies on economic growth. In the view of the transmission mechanism, domestic interests were at the centre of the analysis. The econometric model results indicated that real GDP is influenced by, amongst other variables, monetary variables such as domestic interest rate, exchange rate, credit extension and price differentials between Swaziland and South Africa. The study further finds that credit extension has temporary negative impact on real GDP but with positive long-run effects. Udude (2014) appraised the impact of monetary policy on the growth of Nigeria economy between the period of 1981 and 2012 with the objective of finding out the impact of various monetary policy instruments (money supply, interest rate, exchange rate and liquidity ratio) in enhancing economic growth of the country within the period considered. To identify the stationarity characteristics of the data employed in the empirical investigation, various advanced econometric techniques like Augmented Dickey Fuller Unit Root Test, Johansen Cointegration Test and Vector Error Correction Mechanism (VECM) were employed. The cointegration result indicated that there is long run relationship among the variable with two cointegrating vectors. The result of the vector error correction mechanism (VECM) test indicated that only

exchange rate exerted significant impact on economic growth in Nigeria while other variables did not. Equally, only money supply though statistically insignificant possessed the expected sign while others contradicted expectation. Onyeiwu (2012) addressed the impact of monetary policy on the Nigerian economy. In doing this, the Ordinary Least Squares Method (OLS) was used to analyse data between 1981 and 2008. The result of the analysis showed that monetary policy presented by money supply exerts a positive impact on GDP growth and Balance of Payment but negative impact on rate of inflation.

Njoku and Dike (2016) unearthed the effect of monetary policy on stabilizing the economy of Nigeria and the level of success achieved against its desired objectives. Inflation being one of the indicators of economic stability was measured as dependent variable using liquidity ratio, exchange rate, interest rate and cash reserve requirement as the independent variables which represent instrument of monetary policy. In order to determine the relationship that exists between the dependent variable and independent variables secondary data for the period 1986 to 2013 were collected. The Johansen Co integration test confirmed the existence of a long run relation between the variables. Adopting the multiple regression model, the study confirmed the existence of a significant impact of only one monetary policy instrument (exchange rate) on inflationary rate while other explanatory variables (Cash Reserve Ratio, Liquidity ratio and interest rate) failed to contribute significantly to economic stability. Imoughele and Ismaila (2016) looked into the effect of monetary policy variables and inflation on Nigeria's economic growth via time series data from 1985-2012. Employing co-

integration, error correction model and Granger Causality techniques for the empirical analysis, the Augmented Dickey Fuller (ADF) test statistic revealed that the time series properties of the variables attained stationarity at level, first order and second order. The variables were co integrated at most 1 with at least 2 co integrating equations which indicates a valid long run relationship among economic growth, monetary policy variables and inflation. The Error Correction results showed that growth in Nigeria's economy is highly responsive to bank credit to the private sector, exchange rate, broad money supply and inflation. Chaudhry, Qamber and Farooq (2012) investigated the long run and short run relationships of monetary policy, inflation and economic growth in Pakistan using co-integration and causality analysis during the period 0f 1972-2010. The results indicated that credit to private sector, the variable of financial depth, real exchange rate and budget deficit are found elastic and significant variables to influence the real GDP in Pakistan. The pair-wise Granger Causality results suggested that real GDP and real exchange rate are causing to each other bi-directionally. The real GDP also do cause financial depth (M2GD), domestic credit (CREDIT) and budget deficit (BDEF) uni-directionally. The real exchange rate is also causing the financial depth and budget deficit variables.

Jawaid, Qadri and Ali (2011) empirically examined the effect of monetary, fiscal and trade policy on economic growth in Pakistan using annual time series data from 1981 to 2009. Money supply, government expenditure and trade openness are used as proxies of monetary, fiscal and trade policy respectively. Cointegration and error correction model indicated the existence of positive significant long run and short run relationship of monetary and

fiscal policy with economic growth. Result also indicated that monetary policy is more effective than fiscal policy in Pakistan. In contrast, trade policy has insignificant effect on economic growth both in the short run and in the long run. Purnamawati (2014) ascertained the effect of government policy on economic growth in Indonesia (from the aspect of Fiscal and Monetary). The independent variable in this study was fiscal policy and monetary policy (government spending, the money supply, and taxes), while its dependent variable is economic growth (Gross Domestic Product). The research data was secondary data obtained from the Central Bureau of Statistics and the Ministry of Finance during the years of 1988-2013. The results showed that: the fiscal and monetary aspects have a significant effect on economic growth in Indonesia. Kamaan (2014) quantitatively measured the effect of monetary policy on economic growth in Kenya. Findings from this study indicated that one standard deviation monetary policy shock proxied by the CBR has a negative and insignificant effect on the output in the first two months which then becomes positive and insignificant in the next four months. However, a one standard deviation shock of the interbank rate to inflation is positive and significant for the first two and a half months. The effect continues to be positive but insignificant upto the sixth month.

Ehimare (2011) determined the effectiveness of monetary policy in achieving economic growth in Nigeria for the period 1980-2009. The study employed the Ordinary Least square method in carrying out the research. From the various test carried out it was found that monetary policy rate (MPR) (formerly minimum rediscount rate (MRR), exchange rate and treasury bill investment have negative impact on GDP. Also it was seen that during the

period under review that the manipulation of monetary policy instruments have not proven to be effective in achieving economic growth. Srithilat and Sun (2017) assessed the impact of monetary policy on the economic development by using annual time series data from 1989-2016. The Johansen Cointegration and Error Correction Model was been employed to analyse the association between variables. The finding showed that money supply, interest rate and inflation rate negatively effect on the real GDP per capita in the long run and only the real exchange rate has a positive sign. The error correction model result indicated the existence of short run causality between money supply, real exchange rate and real GDP per capita. Amarasekara (2007) analysed the effects of interest rate, money growth and the movements in nominal exchange rate on real GDP growth and inflation in Sri Lanka for the period from 1978 to 2005. The results showed that none of the sub-samples since 1978 can be identified with a particular targeting regime. In contrast, the interest rate, monetary aggregates and the exchange rate, contain important information in relation to the monetary policy stance.

Nwoko, Ihemeje and Anumadu (2016) evaluated the extent to which the Central Bank of Nigeria Monetary Policies could effectively be used to promote economic growth, covering the period of 1990 to 2011. The influence of money supply, average price, interest rate and labour force were tested on Gross Domestic Product using the multiple regression models as the main statistical tool of analysis. Findings showed that CBN Monetary Policy measures are effective in regulating both the monetary and real sector aggregates such as employment, prices, level of output and the rate of economic growth. Empirical findings from this study indicated that average

price and labour force have significant influence on Gross Domestic Product while money supply was not significant. Interest rate was negative and statistically significant. Kyari (2015) analysed the effect monetary policy variables on savings, national income and investment as proxies to the real sector economy in Nigeria. The paper explored the significance of this channel using VAR model, as tests suggested the null hypothesis of no significant effect was rejected and a conclusion was drawn that one of the monetary variables such as money supply exert a significant impact on the real sector economy. Jovanovic, Krstevska and Popovska-Kamnar (2015) explored the real effects of several monetary-policy instruments in Macedonia, an economy characterized by surplus liquidity. They used regime-switching Vector Autoregressions and track the responses of different economic activity indicators to changes in the monetary policy instruments. Findings suggested that the interest rate channel is weakly effective in Macedonia. The responses to the other instruments are not very sizeable, either, but are significant meaning that monetary policy can affect economic activity through the reserve.

CBN (2014) investigated the effect of monetary policy on different components of real output, by employing the structural vector autoregressive (SVAR) framework. It used a suite of policy and non-policy macroeconomic variables based on quarterly data spanning the period 1993Q1 and 2012Q4. A six variable SVAR for aggregate output (baseline model) and a seven variable SVAR for the disaggregated output components were estimated. Inter alia, they found from the results of the impulse response functions that sectoral output responded heterogeneously following contractionary monetary policy

shocks, with some immediately responding negatively (services and wholesale/retail sectors), while others displayed lagged negative responses (manufacturing, building and construction, and agriculture). The results of the forecast error variance decomposition showed that the most important monetary policy variables that explain the variation in sectoral output are interbank call rate and money supply. Innovations from the monetary policy rate and exchange rate do not significantly explain the variations in output. Jacobson, Jansson, Vredin and Warne (2002) presented estimates of the effects of monetary policy shocks on the Swedish economy. A theoretical model of an open economy was used to identify a structural VAR model. The empirical results from the identified VAR model are compared with two less structural approaches for identification of monetary policy shocks. The first assumed that shocks can be measured as deviations from a forward looking interest rate rule, estimated using Sveriges Riksbank's (Swedish central bank) own forecasts. The second approach focused on the effects of "narrative" monetary policy shocks as given by devaluations of the Swedish currency. They found that plausible theoretical restrictions often result in price puzzles and effects of some devaluations are consistent with the conventional wisdom about the effects of monetary policy shock.

Vinayagathasan (2013) identified the monetary policy indicator that better explains the Sri Lankan monetary policy transmission mechanism. This study also estimates how shocks stemming from foreign monetary policy and/or oil price affect domestic macroeconomic variables. To that end, they use a seven variable structural VAR model by utilizing monthly time series data from Sri Lanka covering the period from January 1978 to December

2011. The empirical findings suggested that the interest rate shocks play a significant and better role in explaining the movement of economic variables than monetary aggregate shocks or exchange rate shocks. Second, the targeting of reserve money is a better strategy for the Sri Lankan economy than a focus on narrow or broad money. Third, foreign monetary policy shocks and oil price shocks do not seem to affect the domestic economy. Apere and Karimo (2014) examined the effectiveness of monetary policy on economic growth and inflation in Nigeria over the period 1970 to 2011. The model was dynamically stable and showed no evidence of serial correlation. Estimation results showed that in the short run it is output and inflation that drives monetary growth, while output growth is affected by inflation only. Results from the impulse response and variance decomposition showed that monetary policy variables may not have an instantaneous impact on output, but are key determinants of output growth in the long–run. Llaudes (2007) studied the effects and the transmission mechanism of unexpected monetary policy shocks in an open economy setting within the context of a VAR framework. The results show that the behaviour of these two sectors varies within a country, with the tradable sector showing a higher degree of responsiveness to policy shocks than the non-tradable.

Forhad, Homaifar and Salimullah (2016) ascertained the effectiveness of the monetary policy transmission of Bangladesh using Structural Vector Autoregressive model (SVAR) for the period of 1972-2014. The SVAR model investigated how a monetary policy shock defined as an unexpected rise in interest rate affects real and nominal macro variables; namely real output, prices, real effective exchange rates, and money supply. Results suggested that

a monetary policy shock does have a short run effect on real output, price level, and exchange rates. A monetary policy shock generates inflationary pressure leading to a devaluation of the Bangladeshi Taka. Nwosa and Saibu (2012) investigated the transmission channels of monetary policy impulses on sectoral output growth in Nigeria for the period 1986 to 2009. Secondary quarterly data were used for the study while granger causality and Vector Auto-regressive Method of analysis were utilized. The results showed that interest rate channel was most effective in transmitting monetary policy to Agriculture and Manufacturing sectors while exchange rate channel was most effective for transmitting monetary policy to Building/Construction, Mining, Service and Wholesale/Retail sectors. Darrat, Tah and Mbanga (2014) determined the relative efficacy of monetary and fiscal policies for stabilizing the US economy, a debate that began with Anderson and Jordan's well-known study. The paper examines the contention of Senbet that monetary policy matters for stabilizing real economic activities; fiscal policy does not. The study showed that this claim is unfounded and apparently the outcome of prematurely dismissing fiscal policy from the cointegrating vector. In the context of a properly specified model, results obtained from cointegration and error-correction tests using data and time period similar to Senbet's consistently suggest that only fiscal policy Granger-causes real output over the long-run. Moreover both monetary and fiscal actions Granger-cause significant short-run effects on the real side of the economy.

Jayaraman and Choong (2012) examined the effectiveness of monetary policies pursued so far under different elected governments and under different economic conditions with specific focus on transmission mechanism

of monetary policy during the last 31 years (1979-2009). Employing a simple bounds testing ARDL procedure, the findings of the study are revealed there is a long run relationship between real output, prices, monetary aggregates, the interest rate, and the exchange rate. The bounds test results confirmed that the relationship runs in only one direction: changes in money supply affect the output; and changes in interest rate do not have any influence; and changes in the exchange rate under the managed float arrangements do have an impact. Thus the transmission mechanism operates only through monetary aggregate and interest rate has no role.

2.3.2 Monetary Policy and Agricultural Performance

Ajudua, Ojima and Okonkwo (2015) examined the impact of monetary policy variables on the agricultural sector in Nigeria from 1986 – 2013. Employing the ordinary least square (OLS) regression method, a multiple regression equation to check the economic relationship between agricultural output with Agriculture Gross Domestic Product (AGDP) as the dependent variable, and Money Supply (MS), Interest Rate (INT), Monetary Policy Rate (MPR) and Inflation Rate (INF) as explanatory variables was carried out. The unit root test to check for stationarity of variables and the Johansen cointegration test to establish long run equilibrium relationship between the dependent and explanatory variables were employed. The study revealed that there exist a relationship between monetary policy and agricultural sector performance in Nigeria. Akintunde, Adesope and Okoruwa (2013) analysed the effectiveness of government annual budgetary allocation to agriculture and the role of monetary policy instruments in the growth of agricultural GDP. Data were sourced from the CBN statistical bulletin (various issues), and the National Bureau of Statistics. The data covered 1980-2012 and the method of

analysis used was the OLS using E-view. The result of the analysis showed that Agricultural Credit Guarantee Scheme Fund, previous year GDP and Consumer Price Index contribute positively to the growth of agricultural GDP, other variables of interest like the interest rate, exchange rate, and government expenditure on agriculture contributed negatively to agricultural GDP growth.

Shahnoushi, Henneberry and Manssori (2009) explored the relationship between food prices and monetary policy variables, using a Vector Error Correction Model (VECM) approach applied to annual data from 1976 to 2006. Results indicated that food prices in Iran have a long-run and short-run equilibrium granger causality relationship with money supply. More specifically, monetary policy reforms are shown to have a significant impact on food prices and domestic agricultural production. Yakubu (2015) examined the impact of monetary policy on selected sectoral output in Nigeria 1986-2012. The study employs the Cointegration test and VAR methodology. Cointegration test revealed that there is long run relationship between monetary policy variables, agricultural sector and manufacturing sector output and no long run relationship between monetary policy variables and services sector output. The result from impulse response function shows that monetary policy rate does not impact agricultural outputs. The variance decomposition showed that inflation was the most important variable that explains variation in the agricultural sector output, followed by M1 and lending rate.

Dadrasmoghaddam and Zamaninejad (2013) studied the effects of macroeconomic variables on agricultural relative prices over the period 1961 to 2004 were used. The effects of monetary variables on the response rate of prices of agricultural and non-agricultural (industry and services) than the

inflation rate changes were analysed using regression analysis and mass analysis. Findings indicated that monetary policy on price index and index price and non-agricultural sector (industry and services) is effective and money in the long-run neutrality hypothesis is rejected. The results also showed that short-term agricultural prices relative to non-agricultural sectors are adjusted faster than monetary shocks. Mushtaq, Abedullah and Ahmad (2011) evaluated the impact of monetary and macroeconomic factors on real wheat prices in Pakistan for the period 1976-2010, using Johansen's co-integration approach. The Augmented Dickey-Fuller test reveals that all the variables used are first-difference stationary, except the trade openness indicator, which is second-difference stationary. There is also a longrun equilibrium relationship among these variables. The results indicated that real money supply, openness of the economy, and the real exchange rate have a significant effect on real wheat prices in the long run. The impulse response function shows that a trade openness shock impacted wheat prices to some extent and that it took three to four years for prices to become stable, following the shock.

Ogunbadejo and Oladipo (2016) ascertained the impact of monetary policy on fishery growth in Nigeria economy. It adopted the error correction model (ECM) techniques to analyse the times series data. The result of the ECM confirmed the existence of long-run equilibrium between the dependent and independent variables. The study showed that long run relationship exists among the variables. The core finding of this study showed that money supply and interest rate are significant monetary policy instruments that drive the growth in Nigeria. Siftain, Nadeem, Javed, Ayub and Ali (2016) investigated

the potential impact of monetary policy on food prices in Pakistan in long run and short run by employing Johansen cointegration technique and vector error correction model, respectively. Monthly time series data from July 1991 to May 2014 were used. This study found that there was a significant relationship between food prices and monetary variables (money supply, and discount rate) in the long run while there was no significant relationship in short run, this study further found that seasonal variation were more responsible for short run fluctuations in the food prices.

Utilising yearly data from 1970 to 2011, Muroyiwa, Sitima, Sibanda and Mushunje (2014) empirically investigated the impact of monetary policy on agricultural gross domestic product in South Africa using Vector Error Correction Model (VECM). The study revealed that inflationary shocks and the money market rate have an enormous negative impact on the performance of the Agricultural GDP whilst the manufacturing index and the stock market help to improve the agricultural GDP. A unit increase in money market rate results in a decrease in the Agricultural GDP by approximately 0.021 percentage points. Hassan (2012) evaluated the long-run neutrality of money supply on agricultural prices; the effect of money supply on agricultural prices; and effect of key macroeconomic indicators on agricultural prices in Nigeria. Using least square estimation, it was observed that money supply had significant impact on agricultural prices and that agricultural prices do not react more sensitively than aggregate price to changes in money supply. Money supply and exchange rate also accounts for 86.2% of variations in agricultural prices.

While focusing on the agricultural and industrial sectors, Nampewo (2014) assessed the effect of a positive interest rate shock, while taking care of the effect of exogenous exchange rate shocks on real output. The analysis was based on a Dynamic Stochastic General Equilibrium (DSGE) model. The empirical findings suggested that the agricultural and industrial sectors are negatively affected by positive interest rate shocks. Apere and Karimo (2015) investigated the transmission channel of monetary policy shocks to agricultural output growth over the period 1970 – 2012. Data were drawn from the Central Bank of Nigeria Statistical Bulletin, 2013. The study estimated a VAR model and showed that producers are able to effectively transfer increases in cost of production to the final consumer through increased prices; and that though monetary policy shocks, interest rate and consumer prices have dominant impacts on agricultural output growth in Nigeria, but that monetary policy shocks transmitted through the interest rate channel are more effective.

Ehinomen and Akorah (2012) assessed the effectiveness of the monetary policies in promoting agricultural development in Nigeria. The data were sourced from the publications of Central Bank of Nigeria (CBN) such as CBN statistical bulletin, CBN statements of Accounts and annual reports, as well as Federal Office Statistics (now National Bureau of Statistics) Publications of relevant years. The relevant variables for which data were sourced include: Minimum Re-discount Rate (MRR), Treasury Bill Rate (TBR), broad money supply (M2), agricultural sector output and index of agricultural production at 1990 base year for the period 1970 to 2010. The method of analysis used was the Ordinary Least Square method (OLS). The

results of the analyses showed that although CBN's monetary policies play crucial role in influencing the level of agricultural productivity in the country, it has not recorded significant progress in terms of providing enabling environment for better performance in the agricultural sector.

2.3.3 Monetary Policy and Industrial/Manufacturing Sector

Kutua and Ngalawa (2016) employed a Panel Structural Vector Autoregressive model ($P-SVAR$) to investigate how monetary policy shocks affect industrial output in BRICS countries using monthly data for the period 1994 to 2013. The study finds that variations in the exchange rate have the largest impact on industrial output in the BRICS countries. It is also observed that inflation rates significantly increase industrial output, peaking after about eleven months. Further analysis revealed that interest rates have a marginal effect on exchange rates, while money supply makes a relatively large contribution to exchange rate fluctuations. Again, it is observed that changes in money supply exert a very large impact on variations in the rate of inflation. Bakare-Aremu and Osobase (2015) unearthed the impact of monetary and fiscal policies (i.e. stabilization policies) on the performance of the manufacturing sector as a real sector in Nigeria, using an error correction mechanisms model, and discover that those policies has expected impact on output of the manufacturing sector in Nigeria both in the short-run and long-run. Relationship among the stabilization policies on one hand and industrial or manufacturing sector out put on the other hand. The model makes use of time series data while ordinary least squared was the techniques of analysis, the data were filtered with use of augmented dickey fuller unit root test while Johansen cointegration test was used to justify the long-run relationship among all included variables. While the error correction model serves the

basis for adjustment from short-run drift (disequilibrium) to long-run equilibrium through its speed of adjustment. The research work established that stabilization policy has a great impact on manufacturing sector performance.

Mehdi and Reza (2011) estimated the major determinants of monetary Policy and investigates how effects of monetary Policy have changed industry sector Growth in Iran. The work provided evidence on the long run relationship between monetary policies industry sector in Iran. Results of the study represented volume of monetary and exchange policies effectiveness in Iran's economy which showed that output growth in the industry can also be enhanced through successful management of the domestic credit through moderate reduction in the cost of borrowing in the financial market. Gichuhi (2016) assessed the impact of monetary policy in boosting manufacturing sector growth in Kenya. The paper used the Vector Autoregression (VAR) Model to measure the impact of monetary policy on the growth of Kenya's manufacturing sector through analysis of four variables; interest rates which are used as the proxy for monetary policy, exchange rates, real GDP and manufacturing sector GDP. Quarterly time series data were used was for the period 1980-2015. The study found a significant positive relationship between monetary policy and growth of Kenya's manufacturing sector in the short-run and long-run. Analysis showed also that Kenyan exchange rates and lending rates are insignificant as they do not cause a major difference in the manufacturing sector mainly due to fiscal dominance and also due to deregulation in Kenya's financial sector and this is evidenced by figures obtained after running the VAR model.

Imoughele and Ismaila (2014) examined the impact of monetary policy on Nigeria's manufacturing sector performance for the period 19862012. Data were collected from the Statistical Bulletin and Annual Report and Statement of Accounts of the Central Bank of Nigeria as well as the Annual Abstracts of statistics (various issues) published by the National Bureau of Statistics (NBS). Unit root test, Granger Causality test, co integration and VAR model were some of the econometrics techniques used for data estimation. The variables were co integrated at most 2 with at least 3 co integrating equations. The individual variables: external reserve, exchange rate and inflation rate were statistically significant to manufacturing sector output while broad money supply and interest rate were not statistically significant to manufacturing sector output in the previous and current year. However, interest rate, exchange rate and external reserve impacted negatively on the sector output but broad money supply and inflation rate affect the sector positively. The pair-wise Granger Causality results suggest that real exchange rate and external reserves granger cause Nigeria's manufacturing output to each other unidirectional. Owolabi and Adegbite (2014) empirically ascertained the impact of monetary policy on industrial growth in Nigerian economy using secondary data obtained from central bank of Nigeria statistical bulletin covering the period of 1970 to 2010. multiple regressions were employed to analyse data on such variables, manufacturing output, Treasury Bills, Deposit & leading and Rediscount Rate for Nigeria over the period 1970 to 2010 were all found have significant effects on the industrial Growth with the Adjusted R2 of 0.8156 (81.56%).

Ghosh (2009) exploit two digit level industry data for the period 1981 to 2004 to ascertain the interlinkage between a monetary policy shock and industry value added. The Vector Autoregression (VAR) was used to estimate the model. The result of the analysis showed that industry exhibit different responses to monetary policy tightening and financial accelerator level are important on explaining the differential responses. Ubi, Effiom and Eyo (2012) empirically assessed the impact of monetary policy on industrialization in Nigeria as an open economy, deploying macroeconomic time series variables of industrial output, exchange rate, interest rate, money supply, balance of trade, and total reserves. Using vector error correction mechanism of ordinary least squares econometric technique as the estimation method, the study revealed that these variables have statistically significant impact on industrialization.

Okonkwo, Egbulonu and Emerenini (2015) examined the impact of monetary policy variables on manufacturing in Nigeria from 1981 – 2012. The researcher specified four explanatory variables based on theoretical underpinnings. The Johansen cointegration test was employed in order to establish long run equilibrium relationship between the explained and the explanatory variables. The error correction model (ECM) was employed to estimate the model. The study revealed that money supply and credit to private sector exert tremendous influence on manufacturing in Nigeria. Omini, Ogbeba and Okoi (2017) investigated the impact of monetary policy shocks on industrial output in Nigeria using restricted VAR (VECM) model and Granger causality test for the period 1970 to 2015. In doing this, data on the manufacturing and solid minerals subsectors was used for the analysis. Results

showed that contribution of manufacturing subsector to GDP responded positively to shocks in monetary policy, commercial bank credit to industrial sector and exchange rates, while contribution of solid minerals subsector to GDP responded positively to shocks in commercial bank credit to the industrial sector and exchange rate after the first year. On the other hand, the causality test result indicated a unidirectional causality running from monetary policy rate and exchange rate to the contribution of manufacturing sector to GDP on the one hand, and commercial bank credit to the industrial sector and exchange rate to the contribution of solid mineral sector to GDP on the other.

Obinna, Ebenezer and Adeyemi (2017) investigated the effect of monetary policy on the manufacturing sector output in Nigeria using a quarterly data from 1981 to 2015 employing the structural vector autoregressive (SVAR) framework. An eight variable SVAR for manufacturing sector output was employed. The short-run SVAR showed that only monetary policy rate and money supply conformed to theory. The impulse response functions showed that all monetary variables as well as other variables with the exception of government expenditure conformed to economic theory. One major finding of the study is that the lending interest rate accounted for the biggest variance in the manufacturing contribution to gross domestic product as shown by the forecast error variance decomposition. Adeleke and Ngalawa (2016) determined the relationship between monetary policy and growth of the manufacturing sector in Algeria. Using a structural vector autoregressive model and quarterly frequency data for the period 1980Q1 to 2010Q4, the study found no evidence that money supply responds to fluctuations in manufacturing sector growth or Gross Domestic Product

(GDP) growth. Interest rates, however, are seen to explain nearly a third of the variations in manufacturing output growth, suggesting that the manufacturing sector is sensitive to interest rates. The study also revealed that money supply variations are largely explained by changes in interest rates. A peek at the monetary transmission process reveals that Algeria employs monetary aggregates as the primary operating tool of monetary policy.

Igbinedion and Ogbeide (2016) the nexus between monetary policy and manufacturing capacity utilization in Nigeria for the 1980-2014 period, using an error-correction modelling approach. The results reveal that both current and past values of lending rate adversely affect manufacturing performance, but manufacturing performance responds positively to the current period's banking credit confirming that policy enhance access to funds can stimulate investment in manufacturing sub-sector in Nigeria. Real exchange rate shows mixed performance; the current exchange rate has a negative but insignificant effect, whereas the impact of one lagged period was positive and significant. Broad money supply positively and significantly influences manufacturing sector growth. Adeleke (2014) assessed the relationship between monetary policy and the growth of manufacturing sectors of Africa's Oil Exporting Countries (AOECs) using a panel data analysis. The study also conducted an individual analysis of each member of the AOECs, using the net oil exporters only and examines the monetary policy transmission mechanism, oil price shock and output relationship in each country using the a Structural Vector Autoregression (SVAR). Results revealed a negative or inverse relationship between oil and manufacturing output growth of the AOECs which might be an indication of the existence of

Dutch Disease in these countries' economies. Secondly, through the panel cointegration analysis the study discovered that there exists a very weak long-run relationship between monetary policy variables and manufacturing output, but the relationship appears to be stronger in the short-run. Thirdly, building on the panel results where the countries exhibit individual cross-sectional differences, the SVAR showed that the effectiveness of monetary policy in promoting the growth of the manufacturing sector in the AOECs is ultimately affected by oil price shock, with the severity depending on the following: the exchange rate system; monetary policy objectives; broadness of export base and level of investment in the manufacturing sector.

2.3.4 Monetary Policy and Building & Construction Sector

Fatnassia, Chawechi, Ftitia and Maatoug (2014) analysed whether a monetary policy based on three main variables (inflation, money supply, and output gap) has a nonlinear impact on real estate investment trust (REIT) markets. In addition, they extended their analysis to examine whether these monetary policy components impact the possibility of boom and bust regimes occurring in the market. Empirically, they proposed different Markov-switching model variants to determine the nonlinear time-varying impact of monetary policy on the REIT market. Results showed the monetary policy environment is supposed to affect, on one hand, the REIT returns and, on another hand, the possibility of boom and bust markets. Finding also proved that expansionary monetary policy has an impact only in the case of boom market. Chou and Chen (2014) investigated whether monetary policy has asymmetric effects on US equity REIT returns by using Markov-switching models. They adopted a number of measures of monetary policy and found

substantial, statistically significant regime switching in the response to a monetary policy action that corresponds to “boom” and “bust” regimes, in which the former is characterized by high returns and low volatility, and the latter by low returns and high volatility. In particular, they found strong evidence that policy actions taken during boom markets have larger effects on REIT returns than those taken during bust markets.

Bredin, Reilly and Stevenson (2007) determined the response of Real Estate Investment Trusts (REIT's) to unexpected changes in US monetary policy. Findings revealed a significant negative response of REIT returns to a surprise change in the policy rate. The paper then examined the potential sources behind such an observed response and observed important differences between the REIT market and the broader equity market. Intuitively the impact of monetary policy on dividend news appears to be more pronounced in the REIT case. Kalu, Gyang, Aliagha, Alias and Joachim (2015) examined the relationship between the inflationary rates and prices of building materials in the face of Monetary Policy. The study covers a period of ten years and considered twenty-four (24) major construction materials. The result showed that there is a significant relationship between the movement of the Monetary Policy Rate (MPR) and the inflation rate. The regression of the prices of the building materials against the MPR showed no significant relationship; though the price fluctuated within the period. MPR did not show to have an effect on movement of building material price; hence MPR may not be an effective tool for price stabilization in the building materials market.

Mallick (2011) determined the impact of monetary policy along with relevant macro-economic factors on the construction sector activities’ growth

and housing prices in Indian context. The empirical result indicated that it is mainly commercial bank credit from supply side and rise in income in demand side have positive influences on the construction sector growth. Nevertheless, it observed a dominance of demand side over supply side factor contributing to shortages of housing. While examining the factors influencing housing prices, they found overall inflation rate puts upward pressure and money supply puts downward pressure. Ning and Li (2015) studied the impact of China's macroeconomic policies (monetary policy) on the efficiency of investment in real estate listed companies. Based on real estate listed companies as the research object, within the 2008-2009 years of time window, this paper examined the relationship between monetary policy and the excessive investment based on the Richardson (2006) model. The results showed that China's state-owned holding listed companies generally have excessive investment behaviour and invest too much greater degree than the private listed companies. And further, tight monetary policy and the investment efficiency of state-owned holding listed companies have significantly negative relationship.

Using quarterly data from1998 to 2010, Xu and Chen (2012) ascertained the impact of key monetary policy variables, including long-term benchmark bank loan rate, money supply growth, and mortgage credit policy indicator, on the real estate price growth dynamics in China. Empirical results consistently demonstrated that expansionary monetary policy tends to accelerate the subsequent home price growth, while restrictive monetary policy tends to decelerate the subsequent home price growth. These results suggested that Chinese monetary policy actions are the key driving forces

behind the change of real estate price growth in China. Findings showed that hot money flow does not have a significant impact on the change of home price growth after controlling for the money supply growth. Kondybayeva and Ishuova (2013) estimated the influence of monetary policy on actual growth of prices per square meter of housing in the Republic of Kazakhstan with the help of factor-augmented vector autoregression model FAVAR, using a data set comprising 76 quarters for the period from 1994:01 to 2012:04. Most aspects of the model are defined from statistical data on the economy of the Republic of Kazakhstan. The increment rate of the CPI ratio, the index of actual effective exchange rate for a group of CIS and non-CIS countries (24 countries), the average monthly rated salary per one employee, the M3 money supply and rated house prices (1 , 2 , 3 , 4 class of comfort) have been calculated. A comparative standard of the analysis of the consequences of monetary policy options for the Republic of Kazakhstan with data for the Russian Federation and Republic of Belarus, shows that monetary policy in the Republic of Kazakhstan meets the standards of the leading countries.

Liang and Cao (2008) investigated the impact of monetary policy on property prices for the case of China over the period 1999Q1-2006Q2. After considering the time series characteristics of the dataset, a high dimensional autoregressive distributed lag (ARDL) framework was used as the appropriate specification and the long-run relationship between property prices, interest rate, money supply and bank credit is identified by the bounds test. The empirical results suggested that there exist both long-run and short-run causality from real long-term interest rate and bank credit to property prices, implying these instruments may be more effective to control roaring property

prices. Gabriel and Lutz (2014) used a structural factor-augmented vector autoregression (FAVAR) model and a large dataset of daily time series to study the impact of unconventional monetary policy on housing, real estate, and related markets. Findings indicated that an expansionary unconventional monetary shock lowers key housing market interest rates; raises equity market returns for homebuilders and real estate investment trusts (REITs); reduces the cost to insure subprime mortgage-backed and commercial real estate debt; and lowers housing distress.

2.3.5 Monetary Policy and Wholesale and Retail Sector

Kelikume (2015) investigated the relative responsiveness of sectoral output to changes in interest rate and credit allocation in Nigeria. The study used quarterly time series data spanning over a period of 23 years, sourced directly from the CBN and the National Bureau of Statistics. The paper utilized the impulse response function and Granger causality test to examine the sensitivity of sector output to changes in interest rate and credit. The result obtained from the study show the various sectors of the Nigerian economy responds significantly to credit allocation but not to interest rate. The result for the Wholesale and Retail Trade sector shows that it takes approximately between two to three quarters for the sector to respond positively to an increase in credit to the private sector while the response of the sector to interest rate changes is relatively flat.

Kolev and Morales (2005) argued that the effects of monetary policy on informal economic activity can be very different from those on the officially reported one. To this point, they considered a two-sector monetary business cycle model in which one of the sectors, which we call the formal

sector, is affected positively by the liquidity effects generated by monetary policy actions. The other sector, which we call the informal sector, shrinks from expansionary monetary policy since the pickup of inflation acts as a tax on the transactions of this sector's participants. The model was consistent with the evidence presented on UK informal sector. According to the estimates an increase in the interest rate causes an expansion of informal sector activity while the official sector contracts.

Nto, Mbanasor and Osuala (2012) examined the influence of monetary policy variables on banks' credit supply to small and medium scale enterprises (SMEs) in Nigeria. Time series data which were collected on quarterly basis were elicited from the Central Bank of Nigeria (CBN) Statistical bulletin and financial statements for five commercial banks. The data covered a period of 1995-2010 and were analysed using Fully Modified Least Squares (FMOLS). Considering the time series properties of the variables, unit root test was done with Philips Perron test to establish stationarity prior to actual analysis. The result of the FMOLS indicated that policies on interest rate and liquidity ratio were negatively and positively significant at 1% probability level respectively.

Hove, Mama and Tchana (2012) employed a New Keynesian Dynamic Stochastic General Equilibrium (DSGE) model to evaluate the optimal monetary policy responses to commodity terms of trade shocks in emerging market economies. The model was calibrated to the South African economy. The study showed that CPI inflation targeting performs relatively better than exchange rate targeting and non-traded in action targeting both in terms of reducing macroeconomic volatility and enhancing welfare. However, macroeconomic stabilisation comes at a cost of increased exchange rate

volatility. The results suggest that the appropriate response to globally induced exogenous shocks is to adopt inflation targeting.

Sariola (2009) build two simple vector autoregression models to find out what are the within-sample effects of monetary policy shocks and exchange rate shocks on Finnish export and import volumes during the period 1997Q1-2007Q4. Contractionary monetary policy shock does not have immediate negative effect on exports. Impact turns negative after 1 1/2 years and is persistent. Impact was not statistically significant thanks to diversified Finnish export market. Monetary policy shock is experienced negatively in imports in four quarters along with slowdown of domestic demand. Euro appreciation against dollar will have an immediate negative impact on Finnish export volume. Deepest impact is over two quarters after the positive shock but the negative effect will last two years. Result is in line with the Finnish export pricing behaviour favouring producer currency pricing which should lead to expenditure switching effect in case of exchange rate appreciation.

Bach, Machado, Kudlawicz-Franco, Martins and Pereira da Veiga (2017) analysed the performance of the automotive retail industry taking into consideration the monetary policy employed by the Brazilian government from 1994 to 2014. Since the research area lacks empirical evidence they decided to use econometric methods that led to estimation models, based on regression and correlation, to check the relation between monetary policy and sector performance. They found out that the performance of the sector, represented by production and export level, was connected to the variables related to the monetary policy. When the performance was measured using exports, the economic variables act as expansion or constrains mechanisms.

Ju, Lin and Wei (2002) combine the credit channel of monetary policy transmission literature and the credit constraints and trade literature to examine how monetary policy affects exports through a credit channel. They identified exogenous monetary tightening events in exporting countries based on the "impossible trinity" theorem and apply them to an empirical gravity model. In a large sector bilateral trade dataset for the years 1970-2000, they found strong and robust evidence that the export-reducing effect of tight monetary policy is significantly amplified by various measures of sector financial constraints. Findings also showed that by reducing financial market frictions at the country level, financial development significantly alleviate the adverse effect of credit constraints.

Danmola and Olateju (2013) assessed the impact of monetary policy on the current account‘s components for the period 1970-2010 in Nigeria. The study employed Johasen Cointegration, Ordinary Least Square Method (OLS) and Error Correction Model, and the study confirms a long-run relationship between monetary policy (proxy by money supply) and components of current account under consideration. Money supply positively influences all the variables expect exchange rate that is negative. The study further showed that money supply significantly influences exports, imports and industrial output at 5% level of significant. The error correction model shows an appropriate sign, indicating that over 30 percent of the of the last year’s shock is adjusted back to the longrun equilibrium association in the present year.

2.3.6 Monetary Policy and Service Sector

Kilinc and Tunc (2016) looked at the sector-level asymmetric effects of the monetary policy shocks on economic activity in Turkey. Using business cycles for the state of the economy, we find that monetary policy shocks have

strong effects on both aggregate GDP, services and industrial production and sub-sectors during recessionary periods. The results are weaker for the expansionary periods. The paper further studies whether the results depend on the state of the credit cycles. Similar results emerge in that the monetary policy is more effective during credit slowdowns with economically more feasible quantitative effects compared to the business cycles.

Kelikume (2015) investigated the relative responsiveness of sectoral output to changes in interest rate and credit allocation in Nigeria. The study used quarterly time series data spanning over a period of 23 years, sourced directly from the CBN and the National Bureau of Statistics. The paper utilized the impulse response function and Granger causality test to examine the sensitivity of sector output to changes in interest rate and credit. The response of the service sector output to interest rate and credit shocks produced an interesting pattern. Service sector output responds positively almost immediately to an increase in credit to the private sector but is relatively insensitive to shocks emanating from a rise in interest rate over the four quarters.

Laokulrach (2013) ascertained whether the increase in service sector employment in Thailand is affected by monetary and fiscal policies or if the effect comes from other policies. The multiple regression analysis was applied in the study. The result showed that the supply side policies and socioeconomic factors affect employment of service sector in Thailand rather than fiscal and monetary policies. Trade openness, and industrialization have positive relationship while minimum wage rate has positive impact to service sector employment.

2.4 Summary of Literature Review

The linkage between monetary policy and real economy has attracted a lot of researches in this area. Studies regarding the nexus between monetary policy and real economy have been pursued majorly on neoclassical theory of money, Keynesian monetary theory and quantity theory of money. The findings emanating from studies differed across countries, however, bulk of the literature acknowledged the significance influence of monetary policy on real economy. Nigeria is a developing country and same applies to the management of its monetary policy instruments. With this, it is ideal to re-ascertain the effect of monetary policy on real economy by disaggregating real economy into agriculture, building & construction, industrial/manufacturing, wholesale & retail trade and services.

WEBOMETRIC ANALYSIS OF EMPIRICAL REVIEW SUMMARY

AUTHORS	PROBLEM STUDIES	SAMPLE SIZE&PERIOD	METHOD OF ESTIMATION	MAJOR FINDINGS
Ndzinisa, P. (2008)	The efficacy of monetary policy on economic growth in Swaziland	Swaziland, using annual data for the period 1980 to 2006	Unit Root (ADF), Ordinary Least Square (OLS), Johansen Co-integration test and ECM	The study further finds that credit extension has temporary negative impact on real GDP but with positive long-run effects.
Obadeyi J. A., Okhiria A. O. & Afolabi V. K. (2016)	Evaluating the Impact of Monetary Policy on the Growth of Emerging Economy: Nigerian Experience	Nigeria, covers between 1990 and 2012	Ordinary Least Square (OLS)	Interest rate, money supply and exchange rate will automatically assist in the mobilization and utilization process of financial resources to achieve a desired national economic growth, but the administration of monetary policy structure is weak in Nigeria.
Falade, O. E. & Folorunso, B. A. (2015)	Fiscal and Monetary Policy Instruments and Economic Growth Sustainability in Nigeria	Nigeria, series using annual data for the period 1970-2013	Unit Root (ADF&PP), Johansen Co-integration test and ECM	There is a long run relationship among fiscal and monetary variables and economic growth.
Saqib, N. & Aggarwal, P. (2017)	Impact of Fiscal and Monetary Policy on Economic Growth in an Emerging Economy	Pakistan using annual time series data from 1984 to 2014.	Unit Root (ADF), Johansen Co-integration test and ECM	Monetary policy is much greater than fiscal policy which implies that monetary policy has more concerned with economic growth than fiscal policy in Pakistan.
Ahmad, D., Afzal, M. & Ghani, U. (2016)	Impact of Monetary Policy on Economic Growth Empirical Evidence of Pakistan	Pakistan time-series data from of 1973 to 2014	Unit Root (ADF), Autoregressive Distribution Lag (ARDL)	Monetary policy positively influence economic growth.

Chipote, P. & Makhetha-Kosi, P. (2014)	Impact of Monetary Policy on Economic Growth: A Case Study of South Africa	South African economy over the period 2000-2010	Unit Root (ADF&PP), Johansen Co-integration test and ECM	Money supply, repo rate and exchange rate are insignificant monetary policy instruments that drive growth in South Africa whilst inflation is significant.
Gul, H., Mughal, K. & Rahim, S. (2012)	Linkage between Monetary Instruments and Economic Growth	Pakistan time-series data from of 1990 to 2010	Ordinary Least Square (OLS)	Tight monetary policy with balanced adjustments in independent variables shows a positive relationship with dependent variable.
Alavinasab, S. M. (2016)	Monetary Policy and Economic Growth A case study of Iran	Iran over the period 1971-2011	Unit Root (ADF&PP), Johansen Co-integration test and ECM	The findings of regression analysis show that in the long run, economic growth has found to be significantly influenced by money supply, exchange rate and inflation rate.
Twinoburyo, E. N. & Odhiambo, N. M. (2016)	Monetary Policy and Economic Growth in Kenya: The Role of Money Supply and Interest Rates	Kenya for the period 1973 to 2013	Autoregressive Distributed Lag (ARDL)	Both short-run and long-run empirical results support monetary policy neutrality, implying that monetary policy has no effect on economic growth – both in the short run and in the long run.
Adigwe, P. K., Echekoba, F. N., & Onyeagba, J. B. C. (2015)	Monetary Policy and Economic Growth in Nigeria: A Critical Evaluation	Nigeria using data between 1980 and 2010.	Ordinary Least Square (OLS)	Monetary policy represented by money supply exerts a positive impact on GDP growth but negative impact on the rate of inflation.
Udude, C. C. (2014)	Monetary Policy and Economic Growth of Nigeria	Nigeria using data from (1981-2012)	Unit Root (ADF), Johansen Co-integration test and VECM	It is only exchange rate exerted significant impact on economic growth in Nigeria while other variables did not.
Onyeiwu, C. (2012)	Monetary Policy and Economic Growth of Nigeria	Nigeria data between 1981 and 2008	Ordinary Least Square (OLS)	Monetary policy exerts a positive impact on GDP growth and Balance of Payment but negative impact on rate of inflation.
Njoku, C. O. & Dike, S. (2016)	Monetary Policy and Economic Stability in Nigeria: An Empirical Analysis	Nigeria data for the period 19862013	Unit Root (ADF), Johansen Co-integration test and Ordinary Least Square (OLS)	the study confirmed the existence of a significant impact of only one monetary policy instrument (exchange rate) on economic stability
Imoughele, L. E. & Ismaila, M. (2016)	Monetary Policy, Inflation and Economic Growth in Nigeria: Exploring the Co-Integration and Causality Relationship	Nigeria time series data from 1985-2012	Unit Root (ADF), co-integration, error correction model and Granger Causality	The Error Correction results showed that growth in Nigeria's economy is highly responsive to bank credit to the private sector, exchange rate, broad money supply and inflation.
Qamber, Y. & Farooq, F. (2012)	Monetary Policy, Inflation and Economic Growth in Pakistan: Exploring the Co-integration and Causality Relationships	Pakistan during the period of 1972-2010	Unit Root (ADF), Johansen Co-integration test and Ordinary Least Square (OLS)	The results indicate that credit to private sector, the variable of financial depth, real exchange rate and budget deficit are found elastic and significant variables to influence the real
Jawaid, S. T., Qadri, F. S. & Ali, N. (2011)	Monetary-Fiscal-Trade Policy and Economic Growth in Pakistan: Time Series Empirical Investigation	Pakistan using annual time series data from 1981 to 2009.	Unit Root (ADF), Johansen Co-integration test and ECM	Existence of positive significant long run and short run relationship of monetary and fiscal policy with economic growth

Purnamawati, G. A. (2014)	the effect of government policy on the economic growth in Indonesia (from fiscal and monetary aspects)	Indonesia during the years of 1988-2013	Double Linear Regression	fiscal and monetary aspects have a significant effect on economic growth in Indonesia.
Kamaan, C. K. (2014)	The Effect of Monetary Policy on Economic Growth in Kenya	Kenya using data from 1985-2012	Vector Auto Regressions (VARs).	One standard deviation monetary policy shock has a negative and insignificant effect on the output in the first two months which then becomes positive and insignificant in the next four months.
Ehimare, O. A. (2011)	The effectiveness of monetary policy in achieving economic growth: the case of Nigeria, 1980-2009	Nigeria and time series data from 1980-2009	Ordinary Least square method	Monetary policy rate (MPR) (formerly minimum rediscount rate (MRR)), exchange rate and treasury bill investment have negative impact on GDP.
Srithilat, P. & Sun, G. (2017)	The Impact of Monetary Policy on Economic Development: Evidence from Lao PDR	Lao PDR time series data from 1989-2016	Unit Root (ADF), Johansen Co-integration test and ECM	The finding shows that money supply, interest rate and inflation rate negatively effect on the real GDP per capita in the long run and only the real exchange rate has a positive sign
Amarasekara, C. (2017)	The Impact of Monetary Policy on Economic Growth and Inflation in Sri Lanka	Sri Lanka for the period from 1978 to 2005.	vector autoregressive (VAR) framework	Monetary policy has significant effect on economic growth
Nwoko, N.M., Ihemeje, J.C.& Anumadu, E.(2016)	The Impact of Monetary Policy on the Economic Growth of Nigeria	Nigeria covering period of 19902011	multiple regression models	Empirical findings from this study indicate that average price and labour force have significant influence on Gross Domestic Product while money supply was not significant.
Kyari, G. V. (2015)	An Evaluation of the Impact of Monetary Policy on the Real Sector in Nigeria	Nigeria using data from 1984 - 2010	VAR model	Monetary variables such as money supply exert a significant impact on the real sector economy.
Jovanovic, B., Krstevska, A. & Popovska-Kamnar, N. (2015)	Can Monetary Policy Affect Economic Activity under Surplus Liquidity? Some Evidence from Macedonia	Macedonia from 2001-2014.	Regime-switching vector Autoregressions	Interest rate channel is weakly effective in Macedonia.
CBN (2014)	Effects of Monetary Policy on the Real Economy of Nigeria: A Disaggregated Analysis	Nigeria, quarterly data spanning the period 1993Q1 and 2012Q4.	Structural VAR	Findings were consistent with economic theory, as output in each sector is expected to decline following monetary tightening.
Jacobsson, T., Jansson, P., Vredin, A. & Warne, A. (2002)	Identifying the Effects of Monetary Policy Shocks in an Open Economy	Sweden from 1970 to 2000	VAR model	They found that the effects of some devaluations are consistent with the conventional wisdom about the effects of monetary policy shock.
Vinayagathasan, T. (2013)	Monetary Policy and the Real Economy: A Structural VAR Approach for Sri Lanka	Sri Lanka from January 1978 to December 2011	Structural VAR	Interest rate shocks play a significant and better role in explaining the movement of economic variables than monetary aggregate shocks or exchange rate shocks

Apere, T. O. & Karimo, T. M. (2014)	Monetary Policy Effectiveness, Output Growth and Inflation in Nigeria	Nigeria over the period 1970 to 2011	Structural VAR	Estimation results showed that in the short run it is output and inflation that drives monetary growth, while output growth is affected by inflation only
Llaudes, R. (2007)	Monetary Policy Shocks in a Two-Sector Open Economy: An Empirical Study	VAR framework.	15 OECD countries.	The results show that the behaviour of these two sectors varies within a country, with the tradable sector showing a higher degree of responsiveness to policy shocks than the non-tradable.
Forhad, A. R., Homaifar, C. A. & Salimullah, A. H. M. (2016)	Monetary Policy Transmission Effect on the Real Sector of the Bangladesh Economy	Bangladesh for the period of 1972-2014	Structural VAR	Monetary policy shock does have a short run effect on real output, price level, and exchange rates.
Nwosa, P. I. & Saibu, M. O. (2012)	The Monetary Transmission Mechanism in Nigeria: A Sectoral Output Analysis	Nigeria for the period 1986 to 2009.	Unit Root (ADF), granger causality and Vector Auto-regressive Method of analysis	The results showed that interest rate channel was most effective in transmitting monetary policy to Agriculture and Manufacturing sectors while exchange rate channel was most effective for transmitting monetary policy to Building/Construction, Mining, Service and Wholesale/Retail sectors.
Darrat, A. F., Tah, K. A. & Mbanga, C. L. (2014)	The Impact of Monetary and Fiscal Policies on Real Output: A Re-examination	Jordan for the period 1959:Q1 to 2010:Q2	Unit Root (ADF), granger causality and ECM	Fiscal policy Granger-causes real output over the long-run
Jayaraman, T. K. & Choong, C. (2012)	How does monetary policy affect real sector of Papua New Guinea?	Papua New Guinea from 1979-2009	Unit Root (ADF), ARDL and ECM	The bounds test results confirm that the relationship runs in only one direction: changes in money supply affect the output; and changes in interest rate do not have any influence; and changes in the exchange rate under the managed float arrangements do have an impact.

2.5 Critique of Literature

Obadeyi, Okhiria and Afolabi (2016) evaluated the impact of monetary policy on the growth of emerging economy. The study covered between 1990 and 2012. Automated Statistical Package Technique (ASPT) was used to analyse the model. The Ordinary Least Square (OLS) technique was adopted in the study in order to assess the relationship among the economic variables. The study showed that interest rate, money supply and exchange rate will automatically assist in the mobilization and utilization process of financial

resources to achieve a desired national economic growth, but the administration of monetary policy structure is weak in Nigeria. The authors' fails to disaggregate the real economy into agriculture, building & construction to ascertain which of the sector in the real economy is greatly affected by adjustments in monetary policy. This is a source of criticism and this issue was seen in the works of Falade and Folorunsho (2015) and Chipote and Makhetha-Kosi (2014). Nwosa and Saibu (2012) studied the effect of monetary policy and real economy of Nigeria and applied only monetary policy rate as the only measurement of monetary policy. The non-inclusion of other instruments like cash reserve ratio, open market operation and liquidity ratio is a source of criticism considering the dynamics in the real economy.

2.6 Gap in Literature

CBN (2014) and Nwosa and Saibu (2012) disaggregated the real economy and determined the influence monetary policy has on its performance. CBN (2014) applied only monetary policy rate as monetary policy instrument while Nwosa and Saibu (2012) utilized interest rate, credit to private sector and exchange which are completely outside the direct and indirect monetary policy instrument of the Central Bank. This study takes a new approach by applying the core monetary policy instruments used by the CBN: cash reserve ratio, monetary policy rate, liquidity ratio and open market operation which where gross omitted in the only two previous studies in Nigeria by CBN (2014) and Nwosa and Saibu (2012). Furthermore, the response of disaggregated real economy: agriculture, building & and construction, wholesale & retail trade and services to shocks in monetary policy instruments: cash reserve ratio, monetary policy rate, liquidity ratio and open market operation in Nigeria environment which absent in the works of

Nwosa and Saibu (2012), Falade and Folorunsho (2015), Njoku and Dike (2016) and Imoughele and Ismaila (2016) among others by utilizing up to date data from 1981 to 2016.

CHAPTER THREE
RESEARCH METHODOLOGY

3.1 Research Design

In order to examine the effect of monetary policy on disaggregated real economy consisting of agriculture, building & and construction, wholesale & retail trade and services sectors from 1981 to 2016, this study adopted a hypothetico-deductive research design. The choice of hypothetico-deductive research design was hinged on the fact that this study was modelled and pursued within the framework of the Keynesian theory of money and its validaty or neutrality can only be ascertained by a hypothetico-deductive approach. In this research design, hypotheses are modelled and formulated from the assumption of an existing theory.

3.2 Nature and Sources of Data

Secondary data sourced from the 2016 edition of the Central Bank of Nigeria's (CBN's) statistical bulletin were utilized for this study. The data for all the variables were on yearly parameters as usually contained in statistical bulletin of Central Bank of Nigeria (CBN). The entire data consisting of agricultural, industrial, building & construction, wholesale & retail trade and service sectors' contribution to real gross domestic product (dependent variables) as well as monetary policy rate, liquidity ratio, money supply, loan to deposit ratio and exchange rate (independent variables) were collected from the mentioned source.

3.3 Model Specification

An estimation of a linear regression equation was followed to actualize the objective of this study. The modified model of Nwosa and Saibu (2012) was utilized accordingly. The original model is as stated below:

$$X_t = [Y^t \; INT \;\; EXT \; LPSC \;\; LASP \;\; LCPI +]^1 + \varepsilon_t \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 3.1$$

Where X_t = dimensional vector of the endogenous variables, EXT = exchange rates; INT = interest rate; $LPSC$ = domestic credit; $LASP$ = asset price index; $LCPI$ = consumer price index and Y^t = sectoral outputs.

Subsequent to Nwosa and Saibu (2012) and disaggregating the real economy, the following models were functionally estimated thus:

$$ACRGDP = f[MPR, LR, MS, LDR, EXR] \quad \ldots\ldots 3.2$$

$$BCCRGDP = f[MPR, LR, MS, LDR, EXR] \quad \ldots\ldots 3.3$$

$$ICRGDP = f[MPR, LR, MS, LDR, EXR] \quad \ldots\ldots 3.4$$

$$WRTCRGDP = f[MPR, LR, MS, LDR, EXR] \quad \ldots\ldots 3.5$$

$$SCRGDP = f[MPR, LR, MS, LDR, EXR] \quad \ldots\ldots 3.6$$

The models were logged to ensure the dependent and independent variables are in the same numerical base and to avoid the probable effect of outlier. The logging is apparent in the models as depicted below:

Model 1

$$ACRGDP_t = \beta_0 + \beta_1 MPR_t + \beta_2 LR_t + \beta_3 MS_t + \beta_4 LDR_t + \beta_5 EXR_t + \varepsilon_t \quad \ldots\ldots 3.7$$

Model 2

$$ICRGDP_t = \beta_0 + \beta_1 MPR_t + \beta_2 LR_t + \beta_3 MS_t + \beta_4 LDR_t + \beta_5 EXR_t + \varepsilon_t \quad \ldots\ldots 3.8$$

Model 3

$$BCCRGDP_t = \beta_0 + \beta_1 MPR_t + \beta_2 LR_t + \beta_3 MS_t + \beta_4 LDR_t + \beta_5 EXR_t + \varepsilon_t \quad \ldots\ldots 3.9$$

Model 4

$$WRTCRGDP_t = \beta_0 + \beta_1 MPR_t + \beta_2 LR_t + \beta_3 MS_t + \beta_4 LDR_t + \beta_5 EXR_t + \varepsilon_t \quad \ldots\ldots 3.10$$

Model 5

$$SCRGDP_t = \beta_0 + \beta_1 MPR_t + \beta_2 LR_t + \beta_3 MS_t + \beta_4 LDR_t + \beta_5 EXR_t + \varepsilon_t \quad \ldots\ldots 3.11$$

Where:

ACRGDP is agricultural contribution to real GDP

BCCRGDP is building and construction contribution to real GDP

ICRGDP is industrial contribution to real GDP

WRTCRGDP is wholesale and retail trade contribution to real GDP

SCRGDP is services contribution to real GDP

MPR is monetary policy rate

LR is liquidity ratio

MS is money supply

LDR is loan to deposit ratio

EXR is exchange rate

a_0 is a constant term, ε is the error term and i is the time trend incorporated in any regression model based on the classical assumption of a linear regression model to account for variables omitted in the model.

3.4 Description of Variables

The dependent variable is real economy and was disaggregated into Agricultural Contribution to Real Gross Domestic Product (ACRGDP), Building & Construction Contribution to Real Gross Domestic Product (BCCRGDP), Industrial Contribution to Real Gross Domestic Product (ICRGDP), Wholesale and Retail Trade Contribution to Real Gross Domestic Product (WRTCRGDP) and Services Contribution to Real Gross Domestic Product (SCRGDP). The independent variables are Monetary Policy Rate (MPR), Liquidity Ratio (LR), Money Supply (MS), Loan to Deposit Ratio (LDR) and Exchange Rate (EXR).

ACRGDP is agricultural contribution to real GDP: This is agricultural sector contribution to the real gross domestic product. Agricultural sector contribution to the real gross domestic product was applied in the works of Ajudua, Ojima and Okonkwo (2015), Akintunde, Adesope and Okorwu (2013) and Ogunbadeyo and Oladipo (2016).

BCCRGDP is building and construction contribution to real GDP: This is building and construction contribution to the real gross domestic product. This variable was utilized in the studies of Bredin, Reily and Stevenson (2007), Kalu, Gyang, Alilagha, Alias and Joachum (2013).

ICRGDP is industrial contribution to real GDP: This is percentage of the real gross domestic product that was accounted by production in the industrial sector of the real economy. Bakare-Aremu and Osobase (2015), Mmehdi and Riza (2011) and Gichuhu (2016) have employed this variable.

WRTCRGDP is wholesale and retail trade contribution to real GDP: This is magnitude of fund that trading activities dominated by small and medium scale enterprises contributes to the real gross domestic product. Atarere (2016) and Sariola (2009) have applied this indicators in monetary policy and wholesale and retail trade nexus.

SCRGDP is services contribution to real GDP: The service sector is also called the tertiary sector. This sector include education, health, social work, computer services, recreation and electricity among others. Peneva (2013) and Kolev and Morales (2005) used this proxy.

MPR is monetary policy rate: This is interest rate charged by the Central Bank of Nigeria in extending funds to deposit money banks in Nigeria. Akintunde, Adesope and Okorwu (2013), Nwosa and Saibu (2012) and Ogunbadeyo and Oladipo (2016) used this instrument of monetary policy.

LR is liquidity ratio: The liquidity ratio is the total specified liquid assets of deposit money banks relative to total liabilities which must be maintain by the deposit money banks to meet up with their short term obligations. CBN (2013)

and Nwosa and Saibu (2012) acknowledged this measurement of monetary policy.

MS is money supply: Money supply is the total amount of money in circulation in an economy at a particular time period. Money supply encompasses coins, currency notes, fixed, savings and time deposit of individuals held in banks. The extent of liquidity different money instruments have on the economy at a specified period stipulates the money supply. Ajudua, Ojima and Okonkwo (2015). Ehinomen and Akorah (2012) and Hassan (2012) have applied this proxy.

LDR is loan to deposit ratio: loan to deposit ratio is the ratio of banks' total loan to total deposits. A higher loan to deposit ratio signals that a deposit money banks is giving out larger fraction of its customers' deposits in the forms of loans and advances. Atarere (2016) and Sariola (2009) applied this indicator.

EXR is exchange rate: Exchange rate is the price of one country's currency against another. It is the rate at which a country's currency is exchanged for another or currencies of other countries. The exchange rate of Nigerian Naira against other countries of the world especially the USA Dollar, British Euro and European Euros has greatly deteriorated over the years starting in 1986 when the Structural Adjustment Programme (SAP) was introduced in Nigerian. Hassan (2012) and Ogunbadejo and Oladipo (2016) have applied this indicator.

3.5 Method of Data Analysis

The result of the analysis were presented based on the research hypotheses and questions formulated. The models were estimated using Auto-regressive Distributive Lag (ARDL) technique of data analysis. The Structural Vector

Auto-regression (SVAR) Model was be used to ascertain the response of selected macroeconomic variables to shocks in monetary policy tools.

Unit Root Test

It is imperative to ascertain the unit root properties of each set of time series data prior to their inclusion in co-integration analysis and eventual evaluation of long-run relationships. This test has gained popularity in the analysis of macro-economic time series data with stochastic trends (Maddala, 2007). Augmented Dickey-Fuller (ADF), Philip Peron (PP) and Kwiatkowski-Phillips-Schmidt-Shin (KPSS) tests will be used to determine the stationarity of the variables in line with econometric postulation. The presence of unit root implies that a time series data set is non-stationary hence not suitable for inclusion in co-integration analysis. However, on the flip side, absence of unit root indicates stationarity of a time series data set and consequent suitability for inclusion in co-integration analysis. Existence or otherwise of unit root in a time series data could be articulated by a consideration of a variable *y* with a unit root expressed by a first order autoregressive equation AR(1) as depicted below:

$$Y_t = \propto Y_{t-1} + \mu_t \qquad 3.x1$$

Where

Y_t = Dependent variable of choice at time t

$\propto$ = Coefficient of one period lagged value of dependent variable of choice

Y_{t-1} = One period lagged value of dependent variable of choice

μ_t = White noise error term assumed statistically independent and randomly distributed with zero mean, constant variance and serially uncorrelated

Flowing from equation 3.xx above, a modelling procedure can be specified generally for evaluation of the existence or otherwise of unit root for the time series data. This is depicted below as follows:

$$\Delta Y_{t-1} = \alpha_0 + \alpha_2 Y_{t-1} + \sum_{i=1}^{\rho} \delta_1 \Delta Y_{t-1} + \epsilon_i \qquad 3.x2$$

Where

Y_t = Variable of choice

α_0 = Intercept

Δ = First difference operator

α_1 = (for i = 1 and 2) and δ_i (for i = 1, 2...ρ) are constant parameters

$\sum_i$ = Stationary stochastic process

ρ = Number of lagged terms chosen by Akaike Information Criterion (AIC) to ensure that $\sum_i$ is white noise

In order to test for the existence or otherwise of unit root, the following implied hypotheses are stated:

H_0: $\alpha_2 = 0$, i.e. there is a unit root – implying time series is not stationary

H_1: $\alpha_2 \neq 0$, i.e. there is no unit root – implying the time series is stationary

Arriving at a decision as to the stationarity or otherwise of a time series data entails comparing the absolute values of the calculated Augmented Dickey Fuller (ADF) tests statistic with those of McKinnon's critical values. If the calculated ADF test statistic is higher than the McKinnon's critical value, then the null hypothesis (H_0) is accepted implying the presence of unit root in Y_{t-1} and $\Delta Y_{t-1}$and connoting that the time series data are non-stationary and also not integrated at levels {of order zero usually written as I(0)}.

However, acceptance of the null hypothesis will warrant additional conduct of stationarity tests on the differenced variants of the time series data with the aim of achieving stationarity. In order to achieve the generalized model for further differencing, there is need for a slight modification of equation 3.xx to

include the second differences on lagged first, as well as the k lags of the second differences as follows:

$$\Delta^2 Y_t = \Psi_1 \Delta Y_{t-1} + \sum_{i=1}^{\rho} \emptyset_i \Delta^2 + \varepsilon_t \qquad 3.x3$$

The hypotheses to be tested in this differenced situation are:

$H_0 = \Psi_1 = 0$, i.e. there is a unit root, implying that the time series is non-stationary

$H_1 = \Psi_1 \neq 0$, i.e. there is no unit root, implying that the time series is stationary Essentially, if the time series become stationary on first differencing, they are said to be co-integrated of order one and this is expressed as I(1). In the event that they are not stationary at first differencing but become so on second differencing, then the time series are said to be integrated of order two, written as I(2). Routinely, the lagged variables are factored into the models to function as control variables as well as to depict the dynamic nature of the study variables – monetary policy and real sectors of the Nigerian economy (Akpasung & Babalola, 2011).

Co-integration Relationship

Co-integration is a sin qua non for SVAR estimation. The co-integration relationship between the variables were ascertained by Auto-Regressive Distributed Lag (ARDL) bound. Ascertaining the long-run dynamic relationship between Monetary Policy and Real Sector of the Nigerian Economy was achieved through the Autoregressive Distributed Lag (ARDL) Bound technique. This technique which was made popular through the works of Persaran and Shin (1996) as well as Pesaran and Pesaran (2001) has significant advantages in the following regards:

i. Utilisation of the method is feasible regardless of whether the time series data are stationary or not. This implies that it is inconsequential whether the time series regressors are stationary at I(0), I(1) or both;
ii. ARDL produces good results when utilised in the estimation procedures involving data with small sample size;
iii. In addition to (ii) above, ARDL also produces quality results even when the time series variables are fractionally integrated.

Granger Causality Test

The direction of the causal relationship between the variables as well as the macroeconomic effect of monetary policy was ascertained with the aid of the Granger causality test. The granger causality technique gives an idea of the predicting power of a variable. Take for instance, a is said to predict changes in b only if a granger-cause b and b is said to predict variation in a only if b granger causes a. For the inferences on the predicting power of a and b to be valid, then p-value of f-statistic of a and b must be statistically significant at 5% level of significance.

Error Correction Model (ECM)

The speed of adjustment of the model to equilibrium following disequilibrium in previous period was assessed using the ADRL error correction model in the event that the variables in the models are co-integrated. The error correction mechanism of the ADRL gives an idea of the nature of relationship (positive/negative) between the variables in short run and long run as well. A negative and significant error correction coefficient depicts a situation that the model is able to return to equilibrium consequent in imbalance is preceding year. However, a positive (whether significant or not) unveils the failure of the

model to move towards equilibrium consequent in disequilibrium recorded in previous periods.

3.6 Regression Results Interpretation

The Adjusted R-Squared, F-Statistic and Durbin Watson test were the statistical criteria to interpret the result of the models that were estimated. Furthermore, the coefficient of the respective variables were used to ascertain the nature of relationship between regressand and the regressor.

Adjusted R-Square (R^2): The Adjusted R-Square details the variation in the dependent variables that was as a result of changes in the independent variable (s). An Adjusted R-Square statistic that is close to one is an indication of tremendous power of the explanatory variable (s) on the dependent variable. Similarly, a very low Adjusted R-Square statistic points to the weakness of the explanatory variable (s) in influencing the dependent variable.

F^* Statistic: The significance of the independent variable (s) in influencing the dependent variable is ascertained by the F-statistic. A p-value of less than 0.05 implies that the explanatory variable(s) is/are significant in influencing the explained variable. However, a p-value higher than 0.05 connotes the insignificance of the explanatory variable(s) in determining the variation in the dependent variable.

Durbin Watson Statistic: The Durbin-Watson test was the conventional tool to check for autocorrelation in the model. In a situation where is the Durbin-Watson detects the presence of autocorrelation in the model, the serial correlation LM test was utilized to correct the autocorrelation issue observed.

3.7 A Priori Expectation

The Keynesian monetary theory envisages that individuals invest idle funds and this spurs real output owing to increase in consumption. By implication,

monetary policy variables are expected to relate positively with disaggregated real economy. The expected signs of the independent variables are shown in Table 1

Table 1: A Priori Expectation

Symbol	Variable	Substitution	Supposed Signs
MPR	Monetary Policy Rate	Monetary Policy	-
LR	Liquidity Ratio	Monetary Policy	-
MS	Money Supply	Monetary Policy	+
LDR	Loan to Deposit Ratio	Monetary Policy	-
EXR	Exchange Rate	Monetary Policy	+

Source: Researcher's Assumption from Keynesian Monetary Theory

CHAPTER FOUR
DATA PRESENTATION AND ANALYSIS

4.1 Data Presentation

The data used in the analysis were sourced from Central Bank of Nigeria statistical bulletin of 2016 and are condensed in the data presentation section. The data relating to the independent variables viz- monetary policy rate, liquidity ratio, money supply growth rate, loan to deposit ratio and exchange rate are detailed in Table 2, while Table 3 presents the corresponding data in respect of the dependent variables – growth rate of agricultural, industrial, building and construction, wholesale & retail trade, and service sectors' contribution to real gross domestic product.

4.1.1 Trend in Monetary Policy Tools

Monetary Policy Rate

Monetary policy rate increased steadily by 333.3% from 6% (1981) to 26% (1993). Thereafter, it dropped gradually by 50% to the final rate of 13% in 2016. It is pertinent to mention that the trend in MPR was not particularly consistent.

Liquidity Ratio

Table 2 shows that liquidity ratio increased by 7.14% from 38.5% in 1981 to 41.25% in 2016. However, the ratio rose as high as 65.10% in 1984 and also followed the wide fluctuating trend witnessed in monetary policy rate and cash reserve ratio.

Growth rate of Money Supply

The growth rate in money supply spiked astronomically in the period under review growing from a modest figure of 6.57% in 1981 to 12.53%. The growth rate in this variable however slowed significantly between 2009 and 2016.

Table 2: Monetary Policy Rate, Liquidity Ratio, Growth rate of Money Supply, Loan to Deposit Ratio and Exchange Rate, Interest Rate from 1981-2016

Year	Monetary Policy Rate (%)	Liquidity Ratio (%)	Growth rate of Money Supply (%)	Loan to Deposit Ratio (%)	Exchange Rate (₦ per USD)
1981	6.00	38.50	6.57	74.50	0.6100
1982	8.00	40.50	18.68	84.60	0.6729
1983	8.00	54.70	13.34	83.80	0.7241
1984	10.00	65.10	10.66	81.90	0.7649
1985	10.00	65.00	11.06	66.90	0.8938
1986	10.00	36.40	4.06	83.20	2.0706
1987	12.75	46.50	18.65	72.90	4.0179
1988	12.75	45.00	25.92	66.90	4.5367
1989	18.50	40.30	3.42	80.40	7.3916
1990	18.50	44.30	31.47	66.50	8.0376
1991	14.50	38.60	21.53	59.80	9.9095
1992	17.50	29.10	32.22	55.20	17.2984
1993	26.00	42.20	34.96	42.90	22.0511
1994	13.50	48.50	25.65	60.90	21.8861
1995	13.50	33.10	16.26	73.30	21.8861
1996	13.50	43.10	13.93	72.90	21.8861
1997	13.50	40.20	13.82	76.60	21.8861
1998	14.31	46.80	18.25	74.40	21.8861
1999	18.00	61.00	24.88	54.60	92.6934
2000	13.50	64.10	32.46	51.00	102.1052
2001	14.31	52.90	21.26	65.60	111.9433
2002	19.00	52.50	17.73	62.80	120.9702
2003	15.75	50.90	19.43	61.90	129.3565
2004	15.00	50.50	12.30	68.60	133.5004
2005	13.00	50.20	19.58	70.80	132.1470
2006	10.00	55.70	30.11	63.60	128.6516
2007	9.50	48.80	25.93	70.80	125.8331
2008	9.75	44.30	30.61	80.90	118.5669
2009	6.00	30.70	14.91	85.70	148.8802
2010	6.25	30.40	14.72	74.20	150.2980
2011	12.00	42.00	9.35	44.20	153.8600
2012	12.00	49.70	12.40	42.30	157.5000
2013	12.00	63.20	-16.62	38.00	157.3100
2014	13.00	38.30	14.25	61.88	158.5626
2015	11.00	39.58	6.47	68.55	193.2792
2016	13.00	41.25	12.53	75.95	253.4923

Source: Central Bank of Nigeria statistical bulletin, 2016.

Loan to Deposit Ratio

Table 2 reveals the trend in loan to deposit ratio during the period 1981 to 2016. Loan to deposit ratio depreciated from 83.2% in 1986 to 75.95% in 2016. From 2014 to 2016, loan to deposit ratio increased considerably from 61.88% in 2014 to 75.95% in 2016.

Exchange Rate

Table 2 dispels that exchange rate (₦/US$) during the period from 1981 to 2016 depreciated significantly from ₦0.61/US$ to ₦253.4923/US$

respectively. This depreciation in the value of the ₦ in comparison to the US$ is quite significant at about 41,455% in the period under review.

Table 3: Growth Rate in Agricultural, Industrial, Building & Construction, Wholesale & Retail Trade and Service Sector Contribution to Real Gross Domestic Product from 1981-2016

Year	Agriculture (%)	Industries (%)	Building & Construction (%)	Wholesale & Retail Trade (%)	Service Sector (%)
1981	88.79	87.74	63.52	77.88	77.63
1982	15.30	-4.93	-11.52	2.42	13.11
1983	15.42	2.33	-10.24	20.35	1.46
1984	21.63	-5.67	-18.31	3.37	5.00
1985	11.30	0.18	-24.42	6.42	5.12
1986	4.09	-0.12	20.16	3.21	7.38
1987	28.90	22.02	11.78	35.94	6.93
1988	31.93	23.91	11.81	-102.69	12.85
1989	16.43	29.86	35.98	77.42	15.14
1990	17.23	17.05	11.43	9.69	17.79
1991	13.48	21.04	11.23	14.24	14.39
1992	33.07	38.22	19.78	32.92	33.32
1993	37.65	17.12	23.81	37.59	25.14
1994	33.68	24.95	22.34	36.98	23.14
1995	43.65	43.45	25.10	42.17	26.69
1996	26.19	25.25	14.08	23.29	17.79
1997	11.63	1.52	14.56	8.99	10.57
1998	9.66	-11.20	24.53	11.73	35.22
1999	6.02	19.85	9.62	8.48	18.55
2000	5.40	37.43	10.06	7.93	29.27
2001	25.16	-6.90	24.89	17.93	21.90
2002	52.60	9.81	15.09	16.80	14.57
2003	13.25	24.95	18.54	16.24	15.22
2004	7.08	27.29	24.81	37.88	27.22
2005	18.19	21.41	-50.38	20.54	27.17
2006	19.71	17.50	24.81	31.86	26.91
2007	12.15	9.45	24.81	9.95	21.97
2008	15.33	15.76	24.81	13.09	17.09
2009	13.12	-7.43	17.38	14.19	16.72
2010	10.91	37.56	17.57	12.18	17.04
2011	7.04	22.99	12.94	-74.25	15.87
2012	11.24	7.95	18.28	12.82	10.05
2013	5.95	3.76	18.22	13.58	15.29
2014	6.67	4.28	16.07	12.74	15.00
2015	8.24	-22.08	8.16	12.89	13.18
2016	8.77	-4.88	3.72	12.80	8.18

Source: Central Bank of Nigeria statistical bulletin, 2016.

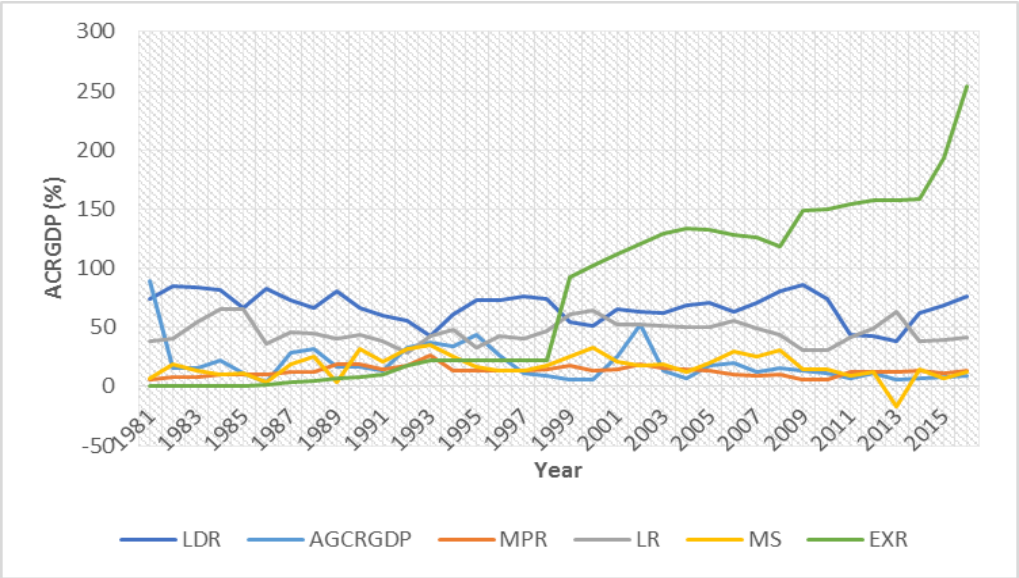
4.1.2 Trend in the Real Sectors of the Economy

Agricultural Sector Contribution to RGDP

The contribution of agriculture to RGDP of Nigeria has been on the rise over the years. In 1981 to contribution of agriculture to RGDP was 88.79% but as at 2016, it settled at 8.77%, a depreciation of over 100.0% in a period of thirty

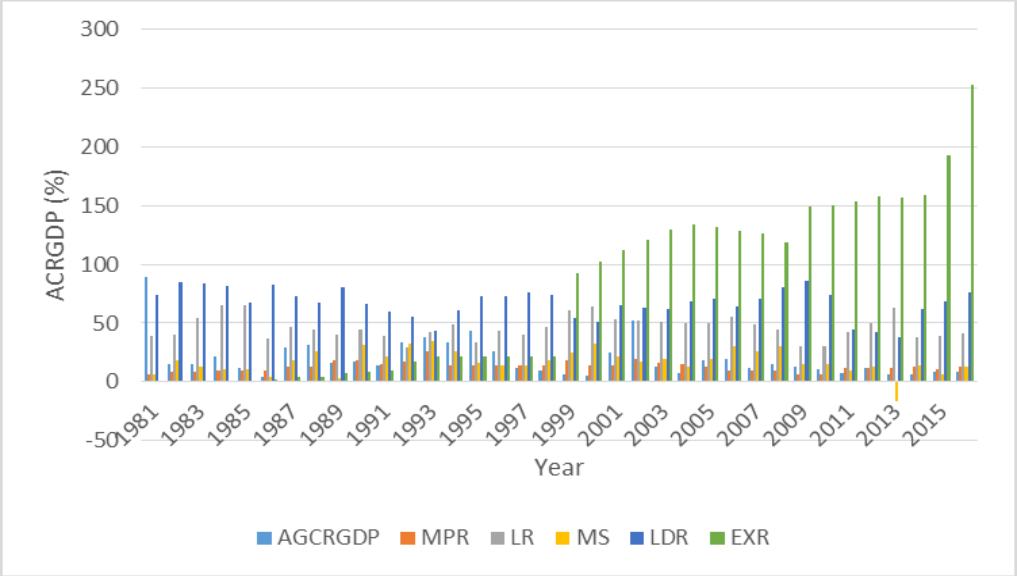
six years. As can be seen in Table 3, Fig.1 and 2, the contribution of agriculture to RGDP has never witness any decline in RGDP output.

Fig. 1: Graphical Trend in Agricultural Contribution to RGDP and Monetary Policy Tools from 1981 to 2016



Source: Central Bank of Nigeria statistical bulletin; and output data from Microsoft 15.0

Fig. 2: Bar Chart Trend in Agricultural Contribution to RGDP and Monetary Policy Tools from 1981 to 2016



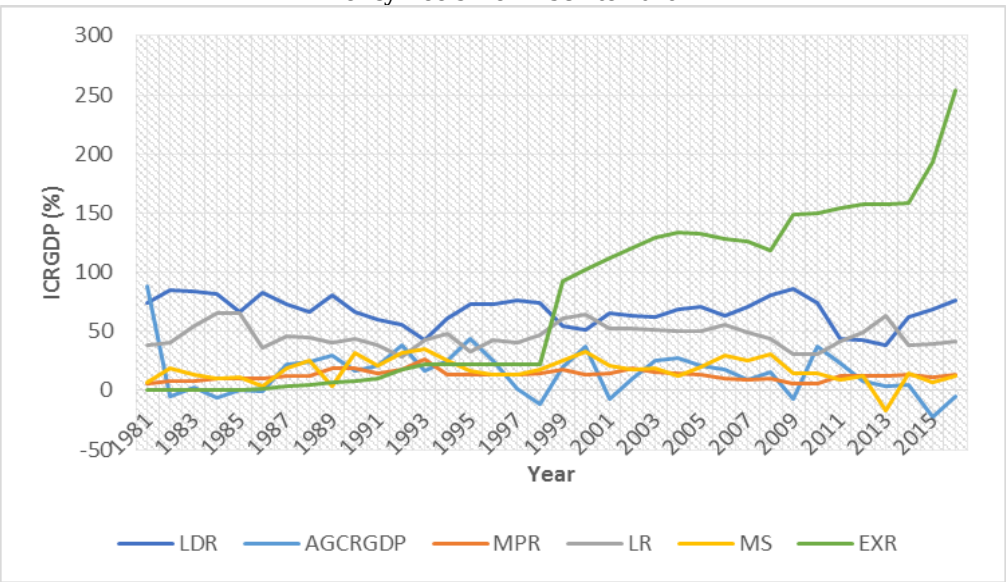
Source: Central Bank of Nigeria statistical bulletin; and output data from Microsoft 15.0

Industrial Sector Contribution to RGDP

Industrial sector's contribution to RGDP was 87.74% in 1981 but depreciated to 37.56% in 2010. Industrial sector contribution to RGDP has witnessed little fluctuation over the years. As at 2016, it was -4.88% compared to 17.05%

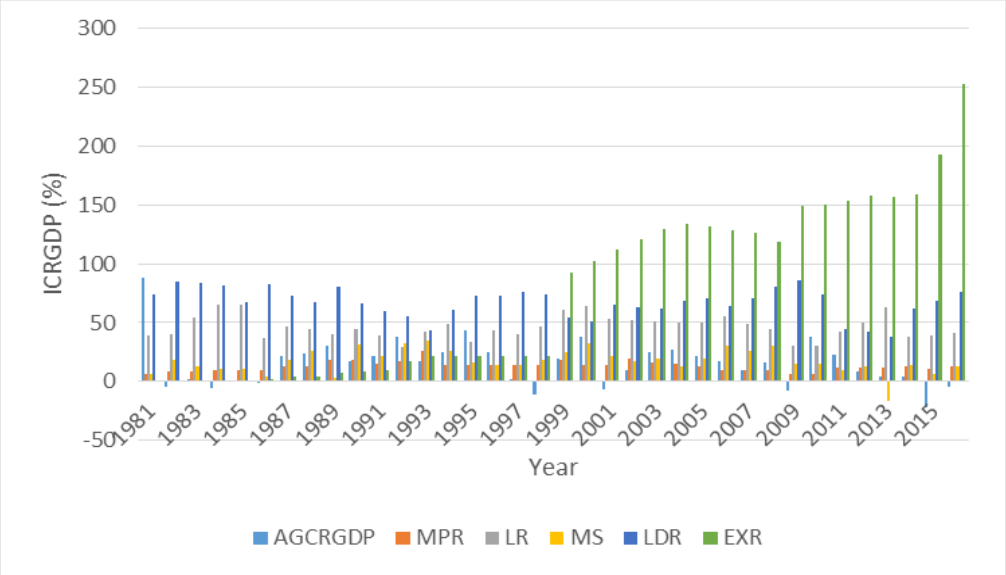
1990. Table 3, Fig.3 and 4 show the trend in industrial sector contribution to RGDP from 1981 to 2016.

Fig. 3: Graphical Trend in Industrial Sector Contribution to RGDP and Monetary Policy Tools from 1981 to 2016



Source: Central Bank of Nigeria statistical bulletin; and output data from Microsoft 15.0

Fig. 4: Bar Chart Trend in Industrial Sector Contribution to RGDP and Monetary Policy Tools from 1981 to 2016



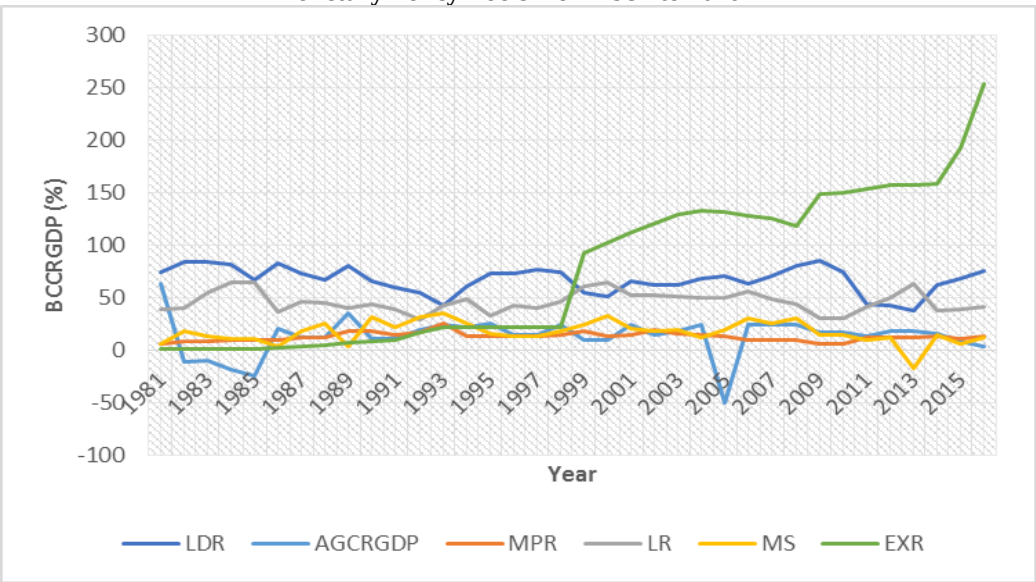
Source: Central Bank of Nigeria statistical bulletin; and output data from Microsoft 15.0

Building and Construction Contribution to RGDP

Building and construction sector has continued to contribute to non-oil GDP of Nigeria. From 63.52% in 1981, it surged to 3.72% in 2016. Between 2001 and 2015 building and construction contribution to RGDP depreciated from

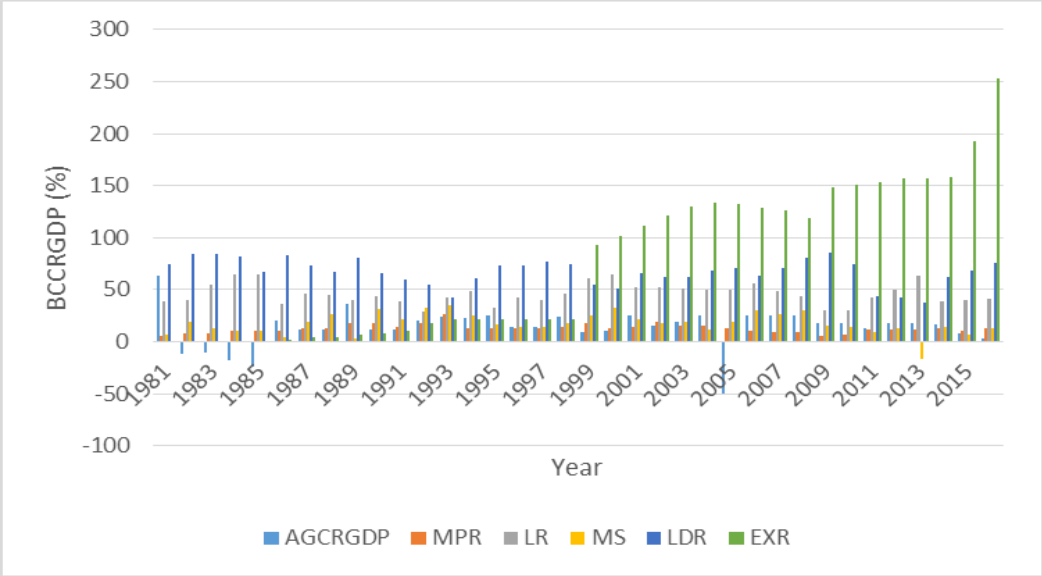
24.89% to 8.16%. Table 3, Fig. 5 and 6 give the graphical and bar chart trend in building and construction contribution to RGDP from 1990 to 2016.

Fig. 5: Graphical Trend in Building and Construction Contribution to RGDP and Monetary Policy Tools from 1981 to 2016



Source: Central Bank of Nigeria statistical bulletin; and output data from Microsoft 15.0

Fig. 6: Bar Chart Trend in Building and Construction Contribution to RGDP and Monetary Policy Tools from 1981 to 2016



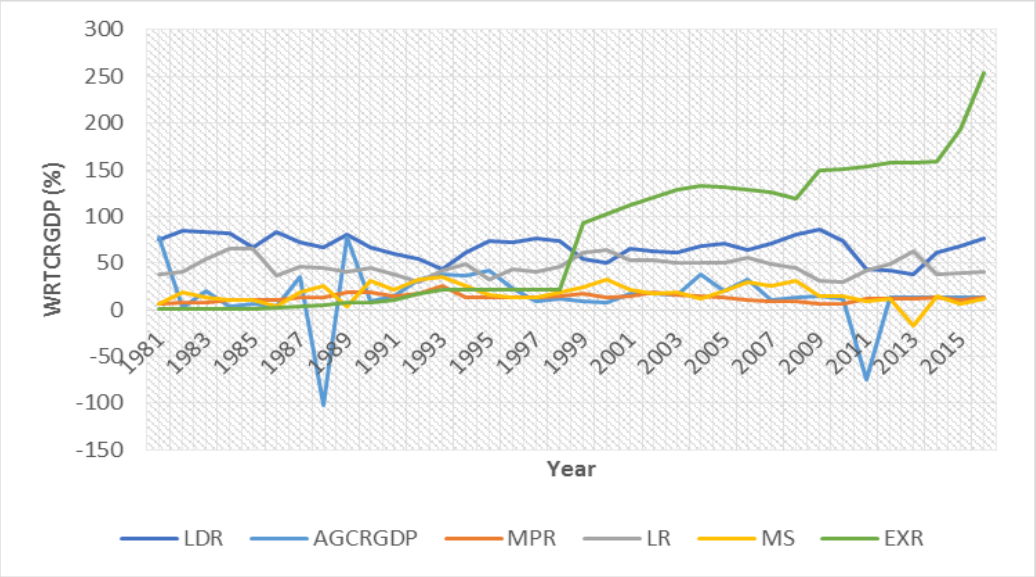
Source: Central Bank of Nigeria statistical bulletin; and output data from Microsoft 15.0

Wholesale and Retail Trade Contribution to RGDP

The growth rate of wholesale and retail trade sector's contribution to RGDP in 2002 was 16.80% showing a marginal rise relative to 17.93% in 2001. In 2011, wholesale and retail trade contribution to RGDP rose to 12.82%

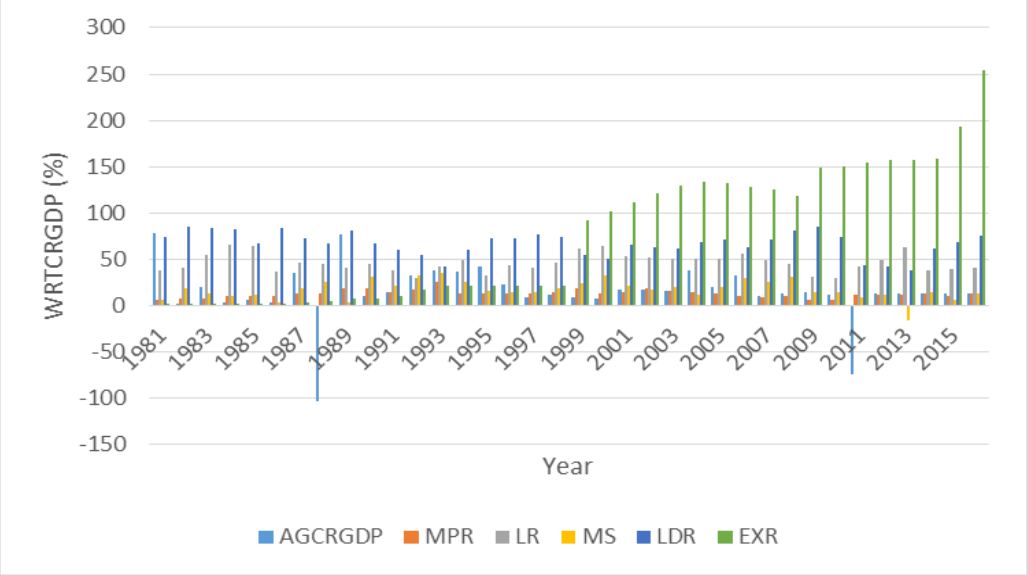
compared to -74.25% in the previous year. As can be seen in Table 3, Fig. 7 and 8, from 2001 to 2016 wholesale and retail trade contribution to RGDP wholesale and retail trade contribution to RGDP maintained a steady rise with the exception of the decline in 2010.

Fig. 7: Graphical Trend in Wholesale and Retail Trade Contribution to RGDP and Monetary Policy Tools from 1981 to 2016



Source: Central Bank of Nigeria statistical bulletin; and output data from Microsoft 15.0

Fig. 8: Bar Chart Trend in Wholesale and Retail Trade Contribution to RGDP and Monetary Policy Tools from 1981 to 2016

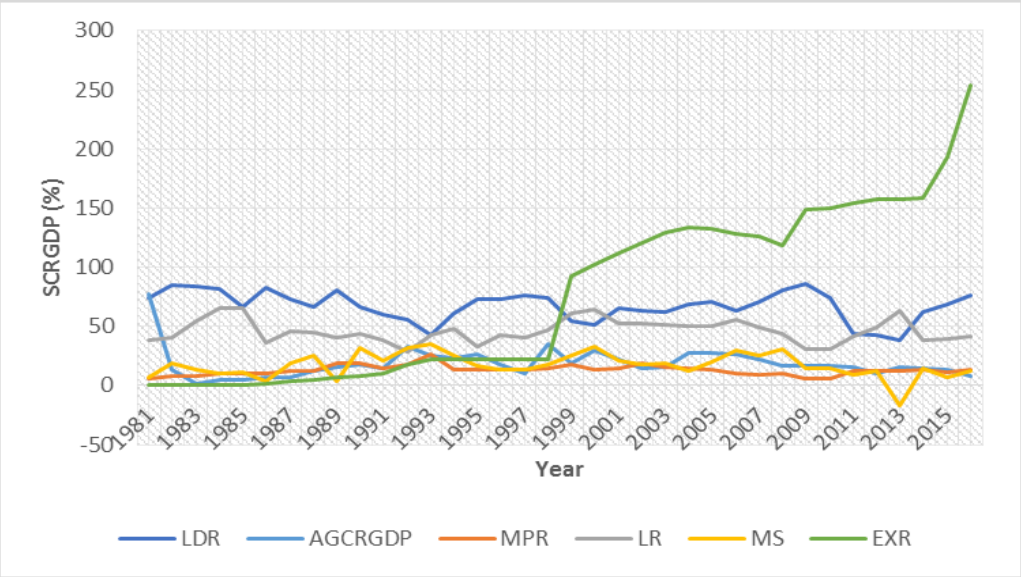


Source: Central Bank of Nigeria statistical bulletin; and output data from Microsoft 15.0

Service Sector Contribution to RGDP

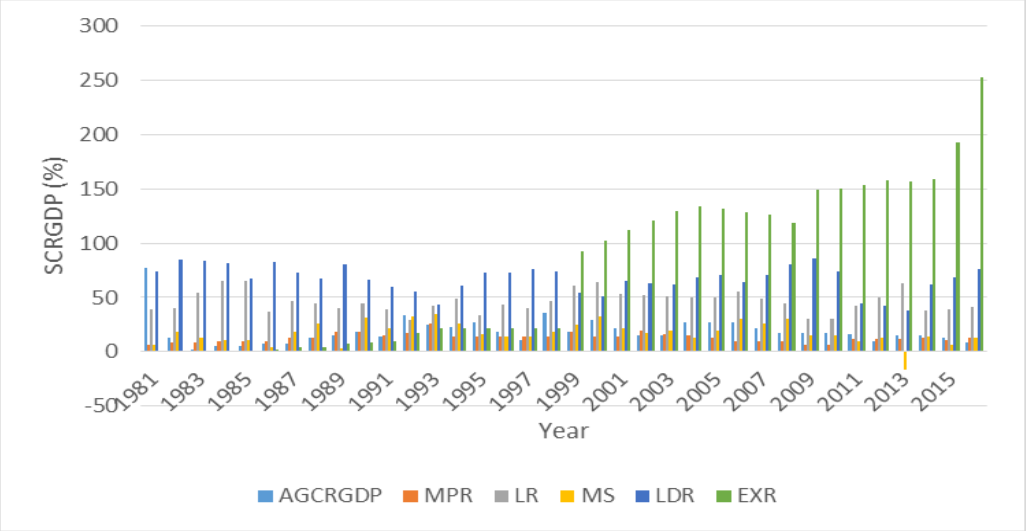
In 1981, the growth rate of service sector's contribution to RGDP was 77.63% but has falling to 10.05% in 2011. The service sector contribution to RGDP has continued to appreciate marginally from 2010 to 2013 before declining to 13.18% in 2014 which further depreciated to 11.08% and 8.18% in 2015 and 2046 respectively. As shown in Table 3, Fig. 9 and 10, service sector contribution to RGDP declined from 14.39% in 1990 to 8.18% in 2016.

Fig. 9: Graphical Trend in Service Sector Contribution to RGDP and Monetary Policy Tools from 1981 to 2016



Source: Central Bank of Nigeria statistical bulletin; and output data from Microsoft 15.0

Fig. 10: Bar Chart Trend in Service Sector Contribution to RGDP and Monetary Policy Tools from 1981 to 2016



Source: Central Bank of Nigeria statistical bulletin; and output data from Microsoft 15.0

4.2 Summary of Descriptive Statistics

The mean, median, maximum, standard deviation, skewness, kurtosis, Jarque-Bera, p-value and number of observations of the data were captured in an attempt to analyse the descriptive statistics of the data. From Table 4, the mean of the variables are 19.64 for ACRGDP, 15.32 for ICRGDP, 13.47 for BCCRGDP, 14.99 for WRTCRGDP, 18.89 for SCRGDP, 12.90 for MPR, 46.20 for LR, 17.30 for MS, 67.19 for LDR and 76.59 for EXR. The median for the data were shown to be 14.39, 17.09, 16.73, 13.34, 16.30, 13.00, 44.65, 17.00, 68.58 and 57.37 respectively for ACRGDP, ICRGDP, BCCRGDP, WRTCRGDP, SCRGDP, MPR, LR, MS, LDR and EXR. The maximum and minimum values are 88.79 and 4.09 for ACRGDP, 87.74 and -22.08 for ICRGDP, 63.52 and -50.38 for BCCRGDP, 77.88 and -102.69 for WRTCRGDP, 77.63 and 1.46 for SCRGDP, 26.0 and 6.0 for MPR, 64.10 and 29.10 for LR, 34.96 and -16.62 for MS, 85.70 and 38.00 for LDR and 253.49 and 0.61 for EXR.

Table 4: Descriptive Properties of the Data

	Mean	Median	Maximum	Minimum	Std. Dev.	Skewness	Kurtosis	Jarque-Bera	P-value	Obs
ACRGDP	19.63500	14.39000	88.79000	4.090000	16.59759	2.339105	9.646880	99.09998	0.000000	36
ICRGDP	15.31722	17.08500	87.74000	-22.08000	20.02506	1.119877	5.976862	20.81731	0.000030	36
BCCRGDP	13.47278	16.72500	63.52000	-50.38000	18.64908	-1.014838	6.582331	25.42902	0.000003	36
WTRCRGDP	14.98806	13.33500	77.88000	-102.6900	31.09441	-1.715855	9.047439	72.52222	0.000000	36
SCRGDP	18.88528	16.29500	77.63000	1.460000	12.89053	2.656927	13.07768	194.6949	0.000000	36
MPR	12.88528	13.00000	26.00000	6.000000	4.099724	0.740914	4.400492	6.235786	0.044250	36
LR	46.22028	44.65000	65.10000	29.10000	9.740112	0.344288	2.500441	6.085545	0.041135	36
MS	17.29861	16.99500	34.96000	-16.62000	10.22779	-0.704715	4.690370	7.265764	0.026440	36
LDR	67.19389	68.57500	85.70000	38.00000	12.59168	-0.641550	2.745340	6.566792	0.037095	36
EXR	76.59332	57.37225	253.4923	0.610000	72.03735	0.423761	1.985578	9.621017	0.029683	36

Source: Output Data from E-views 9.0

The standard deviation for the data are 16.59, 20.02, 18.65, 31.09, 12.89, 4.10, 9.74, 10.23, 12.59 and 72.04 accordingly for ACRGDP, ICRGDP, BCCRGDP, WRTCRGDP, SCRGDP, MPR,R, MS, LDR and EXR The data were positively skewed to normality as evidenced by the positive coefficient of the skewness for all the data. The kurtosis for all the variables were

positive, while the p-value of the Jarque-Bera statistics (significant at 5% level of significance) suggests that the data passed the test of normally and are free from any outlier that might impeded regression result.

4.3 Data Unit Root Test Result

The unit root test is utilized to ascertain stationarity in a time series. A time series has stationarity if a shift in time does not cause a change in the shape of the distribution; unit root are one cause for non-stationarity in time series data. The assessment of the stationarity of the data were carried with Augmented Dickey-Fuller (ADF), Phillips Perron (PP) and Kwiatkowski-Phillips-Schmidt-Shin (KPSS). The unit root test was performed at level and first difference. The non-stationarity of the data at level necessitated the first difference estimation.

Table 5: Result of ADF Test at Level

Variables	Intercept	Trend & Intercept	None	Inference
ACRGDP	7.190474 (1.00)	1.156910 (0.99)	10.22893 (1.00)	Not Stationary
ICRGDP	-1.196133 (0.66)	-1.936975 (0.61)	-1.430495 (0.13)	Not Stationary
BCCRGDP	4.256042 (1.00)	3.942429 (1.00)	4.048125 (0.99)	Not Stationary
WRTCRGDP	17.17339 (1.00)	8.087623 (1.00)	21.48182 (1.00)	Not Stationary
SCRGDP	-3.731131 (0.00)*	-2.935647 (0.17)	-3.919041 (0.00)*	Stationary
MPR	-3.140523 (0.03)**	-3.154491 (0.11)	-0.064878 (0.65)	Stationary
LR	-3.583809 (0.01)*	-3.557924 (0.04)**	-0.591124 (0.45)	Stationary
MS	-4.203854 (0.00)*	-4.265623 (0.00)*	-1.043729 (0.26)	Stationary
LDR	-3.585347 (0.01)*	-3.603950 (0.04)**	-0.460917 (0.50)	Stationary
EXR	1.311125 (0.99)	-1.385767 (0.85)	2.809754 (0.99)	Not Stationary

Source: Data output via E-views 9.0

Note: The optimal lag for ADF test is selected based on the Akaike Info Criteria (AIC), p-values are in parentheses where (*) & (**) denote significance at 1% and 5% respectively.

Table 6: Result of ADF Test at First Difference

Variables	Intercept	Trend & Intercept	None	Inference
ACRGDP	-4.103921 (0.00)*	-5.169283 (0.00)*	-3.003186 (0.01)*	Stationary
ICRGDP	-4.496941 (0.00)*	-5.035577 (0.00)*	-3.558071 (0.00)*	Stationary
BCCRGDP	-3.992608 (0.00)*	-4.808289 (0.00)*	-3.363548 (0.00)*	Stationary
WRTCRGDP	-4.190792 (0.00)*	-5.165963 (0.00)*	-3.318359 (0.00)*	Stationary
SCRGDP	-4.343087 (0.00)*	-5.144301 (0.00)*	-3.540387 (0.00)*	Stationary
MPR	-6.331664 (0.00)*	-6.397278 (0.00)*	-6.400926 (0.00)*	Stationary
LR	-6.425895 (0.00)*	-6.348991 (0.00)*	-6.525491 (0.00)*	Stationary
MS	-10.16052 (0.00)*	-10.02897 (0.00)*	-10.31634 (0.00)*	Stationary
LDR	-5.540247 (0.00)*	-5.518290 (0.00)*	-5.623491 (0.00)*	Stationary
EXR	-3.669242 (0.01)*	-3.995108 (0.02)**	-3.041231 (0.00)*	Stationary

Source: Data output via E-views 9.0

Note: The optimal lag for ADF test is selected based on the Akaike Info Criteria (AIC), p-values are in parentheses where (*) & (**) denote significance at 1% and 5% respectively.

Table 7: Result of PP Test at Level

Variables	Intercept	Trend & Intercept	None	Inference
ACRGDP	6.128911 (1.00)	1.264930 (0.99)	7.972190 (1.00)	Not Stationary
ICRGDP	0.015052 (0.95)	-1.674573 (0.74)	0.831172 (0.87)	Not Stationary
BCCRGDP	5.235586 (1.00)	2.015735 (1.00)	6.664099 (1.00)	Not Stationary
WRTCRGDP	13.78297 (1.00)	8.005502 (1.00)	16.32731 (1.00)	Not Stationary
SCRGDP	10.55226 (1.00)	6.728242 (1.00)	12.49895 (1.00)	Not Stationary
MPR	-3.085940 (0.04)**	-3.058354 (0.13)	-0.223216 (0.60)	Stationary
LR	-3.570472 (0.01)*	-3.539208 (0.05)**	-0.238938 (0.59)	Stationary
MS	-4.319196 (0.00)*	-4.306483 (0.00)*	-1.395432 (0.15)	Stationary
LDR	-3.570472 (0.01)*	-3.539208 (0.05)**	-0.238938 (0.59)	Stationary
EXR	1.142402 (0.99)	-1.616624 (0.77)	2.564295 (0.99)	Not Stationary

Source: Output Data via E-views 9.0

Note: Spectral estimation methods are Bartlett kernel and Newey-West method for Bandwidth, p-values are in parentheses where (*) & (**) denotes significance at 1% and 5% respectively.

Table 8: Result of PP Test at First Difference

Variables	Intercept	Trend & Intercept	None	Inference
ACRGDP	-18.75149 (0.00)*	-24.30233 (0.00)*	-9.401758 (0.00)*	Stationary
ICRGDP	-8.292704 (0.00)*	-8.279287 (0.00)*	-8.418803 (0.00)*	Stationary
BCCRGDP	-3.876697 (0.01)*	-3.874369 (0.02)**	-4.038579 (0.00)*	Stationary
WRTCRGDP	-9.672475 (0.00)*	-11.76694 (0.00)*	-8.521654 (0.00)*	Stationary
SCRGDP	-9.672475 (0.00)*	-6.164094 (0.01)*	-5.152701 (0.00)*	Stationary
MPR	-7.457876 (0.00)*	-7.411914 (0.00)*	-7.663519 (0.00)*	Stationary
LR	-11.33251 (0.00)*	-11.33251 (0.00)*	-11.49966 (0.00)*	Stationary
MS	-11.43484 (0.00)*	-12.88152 (0.00)*	-11.61015 (0.00)*	Stationary
LDR	-6.100304 (0.00)*	-6.158454 (0.00)*	-5.992181 (0.00)*	Stationary
EXR	-3.669723 (0.00)*	-3.979343 (0.02)**	-2.994521 (0.00)*	Stationary

Source: Output Data via E-views 9.0

Note: Spectral estimation methods are Bartlett kernel and Newey-West method for Bandwidth, p-values are in parentheses where (*) & (**) denotes significance at 1% and 5% respectively.

Table 9: Result of KPSS Test at Level

Variables	Intercept	Trend & Intercept	Inference
ACRGDP	0.615323 (0.00)*	0.191059 (0.00)*	Stationary
ICRGDP	0.575365 (0.00)*	0.190907 (0.00)*	Stationary
BCCRGDP	0.542322 (0.00)*	0.199810 (0.00)*	Stationary
WRTCRGDP	0.586831 (0.00)*	0.210950 (0.00)*	Stationary
SCRGDP	0.574549 (0.00)*	0.208448 (0.00)*	Stationary
MPR	0.154592 (0.00)*	0.148170 (0.00)*	Stationary
LR	0.119727 (0.00)*	0.119106 (0.00)*	Stationary
MS	0.176928 (0.00)*	0.154076 (0.00)*	Stationary
LDR	0.306578 (0.00)*	0.066736 (0.00)*	Stationary
EXR	0.687698 (0.00)*	0.120301 (0.00)*	Stationary

Source: Data output via E-views 9.0

Note: The optimal lag for ADF test is selected based on the Akaike Info Criteria (AIC), p-values are in parentheses where (*) & (**) denote significance at 1% and 5% respectively.

ADF results are presented in Tables 5 and 6, PP tests in Tables 7 and 8, whereas KPSS unit root test result were summarized in Tables 9 and 10. The ADF and PP unit root test results indicated that all the variable were not stationary at level but all became stationary at first difference of estimation via none, intercept, and trend and intercept. The data achieved stationarity through the KPSS estimation at level form but not stationary at first difference

estimation. In overall, the data were stationary which free them from any stationarity defect that most time series data possess.

Table 10: Result of KPSS Test at First Difference

Variables	Intercept	Trend & Intercept	Inference
ACRGDP	0.746957 (0.00)*	0.143825 (0.00)*	Stationary
ICRGDP	0.208311 (0.05)**	0.083756 (0.19)	Stationary
BCCRGDP	0.529779 (0.00)*	0.162034 (0.00)*	Stationary
WRTCRGDP	0.703207 (0.00)*	0.201384 (0.00)*	Stationary
SCRGDP	0.597783 (0.00)*	0.200526 (0.00)*	Stationary
MPR	0.105128 (0.74)	0.039845 (0.57)	Not Stationary
LR	0.336822 (0.96)	0.288681 (0.71)	Not Stationary
MS	0.159549 (0.93)	0.141558 (0.70)	Not Stationary
LDR	0.153544 (0.98)	0.111643 (0.67)	Not Stationary
EXR	0.343652 (0.01)*	0.068785 (0.06)	Stationary

Source: Data output via E-views 9.0

Note: The optimal lag for ADF test is selected based on the Akaike Info Criteria (AIC), p-values are in parentheses where (*) & (**) denote significance at 1% and 5% respectively.

4.4 Diagnostics Test

Serial Correlation LM Test

When the variables in a model are serially correlated, inferences from estimation of such model would be spurious and unreliable in statistical terms. In order to prevent the occurrence of serial correlation in the models specified for this study, the serial correlation LM test was performed. The result which indicated in Table 11 reveals that the variables in the models were not serially correlated with each other as the p-values are insignificant at 5% level of significance.

Table 11: Serial Correlation LM Test

Estimates	F-statistic	P-value
Model 1	3.495319	0.1645
Model 2	2.044734	0.4433
Model 3	2.208946	0.3770
Model 4	6.019503	0.2464
Model 5	0.480689	0.5598

Source: Data output via E-views 9.0

Heteroskedasticity Test

The presence of heteroskedasticity is considered not ideal and casts a dent to inference that would be made from such estimation of a model. In an attempt to be sure of the absence of of heteroskedasticity, the models were all checked accordingly. The results of the test which are highlighted in Table 12 below

point to the fact that there is no heteroskedasticity in the models judging from the insignificant p-values of the f-statistics coefficient at 5% level of significance.

Table 12: Heteroskedasticity test

Estimates	F-statistic	P-value
Model 1	0.774524	0.7020
Model 2	0.595965	0.8057
Model 3	2.173896	0.3642
Model 4	1.069483	0.5959
Model 5	0.641851	0.7784

Source: Data output via E-views 9.0

Ramsey RESET Test

The Ramsey Reset specification is the general test for how well as model is specified. It determine whether non-linear combination of the fitted values help explain the dependent variable. With the result in Table 13, the non-linear combination of the fitted values of the independent does not explain the changes in the dependent owing to the insignificant p-values (5% level of significance) for all the regression models estimated.

Table 13: Ramsey Reset Specification

Estimates	t-statistic	df	P-value
Model 1	5.155098	(4, 1)	0.3176
Model 2	3.704058	2	0.0658
Model 3	11.93313	1	0.0532
Model 4	2.275213	1	0.2636
Model 5	1.417700	2	0.2920

Source: Data output via E-views 9.0

Multicollinearity Test

Multi-collinearity is said to exist in a multiple regression model if one variable can be linearly predicted from the others with a substantial degree of accuracy. To avoid the presence of multi-collinearity between the explanatory variables, the correlation matrix in Table 14 was estimated. From the correlation matrix, the highest correlation (0.48) between the independent variables was found

between monetary policy rate and liquidity. Consequently, multi-collinearity would not be said to exist between the explanatory variables.

Table 14: Correlation Matrix

	ACRGDP	ICRGDP	BCCRGDP	WTRCRGDP	SCRGDP	MPR	LR	MS	LDR	EXR
							-			-
ACRGDP	1.00000	0.61507	0.393514	0.343152	0.63844	0.07047	0.18822	0.12179	0.05390	0.37641
ICRGDP	0.61507	1.00000	0.444722	0.301634	0.68589	0.05101	-0.1972	0.16249	-0.1539	-0.2450
BCCRGDP	0.39351	0.44472	1.000000	0.320263	0.53405	0.09600	-0.3582	-0.0119	-0.1196	-0.0130
WTRCRGDP	0.34315	0.30163	0.320263	1.000000	0.40251	0.12273	-0.0947	-0.0741	0.17649	-0.1256
SCRGDP	0.63844	0.68589	0.534045	0.402513	1.00000	-0.0130	-0.1814	0.14640	-0.1001	-0.0938
MPR	0.07047	0.05101	0.096001	0.122729	-0.0130	1.00000	0.06856	0.34737	-0.4810	-0.1244
LR	-0.1882	-0.1972	-0.358249	-0.094655	-0.1814	0.06855	1.00000	-0.0442	-0.2897	0.03519
MS	0.12179	0.16249	-0.011905	-0.074077	0.14640	0.34737	-0.0442	1.00000	-0.0795	-0.1613
LDR	0.05390	-0.1539	-0.119612	0.176487	-0.1001	-0.4810	-0.2897	-0.0795	1.00000	-0.2736
EXR	-0.3764	-0.2450	-0.012952	-0.125565	-0.0938	-0.1244	0.03519	-0.1613	-0.2736	1.00000

Source: Data output via E-views 9.0

4.5 ARDL Co-integration Relationship

The confirmation of the stationarity of the data made way for the testing of the long run relationship between monetary policy and sectorial performance of the real sector. The Autoregressive Distributive Lag (ARDL) was selected because it takes into consideration the different order of integration of variables. The biases that may be associated with stationarity at level or first difference estimation is completely eliminated with the application of the ARDL co-integration methodology. The result of the ARDL long run relationship is detailed in Tables 15 – 19. From the ARDL result it was observed that monetary policy has long run relationship only with agricultural sector (Table 15) and wholesale & retail trade sector (Table 18). This assertion is based on the value of the f-statistic of 44.62909 for agricultural sector and 8.032951 for wholesale and retail trade which are all greater than the upper and lower bound test of 3.79 and 2.62 respectively at 5% significance level. Industrial, building & construction and service sector are not related with monetary policy in the long run. The foregoing result leads to the conclusion that it is only agricultural and wholesale &retail trade sectors of the economy

that are related with monetary policy of the Central Bank of Nigeria in the long run.

Table 15: ARDL Bound Test for Agricultural Sector and Monetary Policy

T-Test	5% Critical Value Bound		Remark
F-Statistic	**Lower Bound**	**Upper Bound**	
44.62909	2.62	3.79	Null Hypothesis Rejected

Source: Data output via E-views 9.0

Table 16: ARDL Bound Test for Industrial Sector and Monetary Policy

T-Test	5% Critical Value Bound		Remark
F-Statistic	**Lower Bound**	**Upper Bound**	
1.797363	2.62	3.79	Null Hypothesis Rejected

Source: Data output via E-views 9.0

Table 17: ARDL Bound Test for Building & Construction Sector and Monetary Policy

T-Test	5% Critical Value Bound		Remark
F-Statistic	**Lower Bound**	**Upper Bound**	
3.019287	2.62	3.79	Null Hypothesis Rejected

Source: Data output via E-views 9.0

Table 18: ARDL Bound Test for Wholesale & Retail Trade Sector and Monetary Policy

T-Test	5% Critical Value Bound		Remark
F-Statistic	**Lower Bound**	**Upper Bound**	
8.032951	2.62	3.79	Null Hypothesis Rejected

Source: Data output via E-views 9.0

Table 19: ARDL Bound Test for Service Sector and Monetary Policy

T-Test	5% Critical Value Bound		Remark
F-Statistic	**Lower Bound**	**Upper Bound**	
1.764403	2.62	3.79	Null Hypothesis Rejected

Source: Data output via E-views 9.0

4.6 Nature of ARDL Long Run Relation and Speed of Adjustment

Sequel to the affirmation of a long run relationship between Monetary policy and the constituent sub sectors of the real economy, it becomes imperative to determine the nature of the long run relationship as well as the speed of adjustment to equilibrium as these will assist in making further inferences. Going by the result in Table 20 regarding the long run nexus between agricultural sector and monetary policy in Nigeria, it was observed that monetary policy rate, money supply, loan to deposit ratio and exchange rate (significant) have negative relationship with agricultural sector's contribution to real gross domestic product, liquidity ratio has positive insignificant relationship with agricultural sector's contribution to real gross domestic

product. With regard to the speed of adjustment, the ECM coefficient reflected the expected negative sign which is significant. In the light of this, there is tendency for the model to move towards equilibrium subsequent to disequilibrium in prior period, hence there significant error correction in the first model as stated. About 80.11% of error in the previous period is corrected in the current year.

Table 20: ARDL Error Correction ACRGDP→ MPR, LR, MS, LDR and EXR

Co-integrating Form				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
D(ACRGDP(-1))	-0.147945	0.164896	-0.897206	0.4107
D(ACRGDP(-2))	-0.187086	0.112077	-1.669270	0.1559
D(ACRGDP(-3))	-0.128037	0.042439	-3.016995	0.0295
D(MPR)	-1.511304	0.317302	-4.762976	0.0050
D(MPR(-1))	-0.273489	0.283818	-0.963605	0.3795
D(MPR(-2))	-0.549779	0.303308	-1.812608	0.1296
D(LR)	-0.095590	0.100821	-0.948113	0.3866
D(LR(-1))	0.272200	0.093822	2.901255	0.0337
D(LR(-2))	-0.406866	0.073610	-5.527341	0.0027
D(LR(-3))	-0.409179	0.094481	-4.330821	0.0075
D(MS)	0.078677	0.081433	0.966164	0.3783
D(MS(-1))	-0.386350	0.059234	-6.522462	0.0013
D(MS(-2))	-0.051114	0.102483	-0.498756	0.6391
D(MS(-3))	0.554406	0.138928	3.990610	0.0104
D(LDR)	-0.218031	0.117778	-1.851201	0.1234
D(LDR(-1))	0.520827	0.117896	4.417697	0.0069
D(EXR)	-0.007759	0.040904	-0.189688	0.8570
D(EXR(-1))	-0.152468	0.045475	-3.352781	0.0203
D(EXR(-2))	-0.315281	0.046526	-6.776437	0.0011
D(EXR(-3))	0.521977	0.048064	10.860022	0.0001
CointEq(-1)	-0.801106	0.233167	-3.435754	0.0185
Long Run Coefficient				
MPR	-2.029511	1.189288	-1.706492	0.1486
LR	0.015401	0.138656	0.111070	0.9159
MS	-0.014505	0.214651	-0.067577	0.9487
LDR	-1.350385	0.542673	-2.488396	0.0553
EXR	-0.210512	0.059603	-3.531881	0.0167
C	145.259964	53.413252	2.719549	0.0418

Source: Data output via E-views 9.0

The long run relationship between wholesale & retail trade sector's contribution to real gross domestic product is depicted in Table 21 and the results reveal that monetary policy rate and liquidity ratio have positive and insignificant relationship with wholesale & retail trade sector contribution to real gross domestic product. On the contrary, money supply, loan to deposit ratio and exchange rate exhibited negative insignificant relationship with wholesale & retail trade sector. From the error correction adjustment, it was

observed that the ECM, though insignificant did not portray the supposed negative sign. Taking inference from this, there is no tendency for the model to move towards equilibrium following disequilibrium in previous period, hence no significant error correction taking place in the model.

Table 21: ARDL Error Correction WRTCRGDP→ MPR, LR, MS, LDR and EXR

Co-integrating Form				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
D(WRTCRGDP(-1))	0.623743	0.705969	0.883527	0.4702
D(WRTCRGDP(-2))	-0.278539	0.508005	-0.548299	0.6385
D(WRTCRGDP(-3))	-0.905338	0.321568	-2.815389	0.1064
D(MPR)	-13.444428	5.378712	-2.499563	0.1296
D(MPR(-1))	-0.985290	2.531363	-0.389233	0.7346
D(MPR(-2))	-7.403767	3.570130	-2.073809	0.1738
D(MPR(-3))	-7.938925	3.751411	-2.116251	0.1686
D(LR)	-3.066666	1.520296	-2.017151	0.1812
D(LR(-1))	-4.520316	1.368745	-3.302527	0.0807
D(LR(-2))	2.355706	1.678392	1.403549	0.2956
D(LR(-3))	-3.184603	2.179625	-1.461078	0.2815
D(MS)	-1.559184	0.933334	-1.670553	0.2368
D(MS(-1))	-2.186981	0.952060	-2.297105	0.1484
D(MS(-2))	1.453701	0.935755	1.553506	0.2605
D(MS(-3))	2.815780	2.024828	1.390627	0.2989
D(LDR)	-2.954913	1.470302	-2.009732	0.1822
D(LDR(-1))	-0.508879	1.529342	-0.332744	0.7710
D(LDR(-2))	-2.325117	1.256889	-1.849898	0.2056
D(LDR(-3))	2.510066	1.166448	2.151887	0.1643
D(EXR)	1.565006	0.920672	1.699851	0.2313
D(EXR(-1))	-0.563649	0.442179	-1.274710	0.3305
D(EXR(-2))	-0.723240	0.525155	-1.377193	0.3023
D(EXR(-3))	0.697142	0.653587	1.066641	0.3978
CointEq(-1)	-1.881213	0.569750	-3.301823	0.0808
Long Run Coefficient				
MPR	4.262827	2.272323	1.875978	0.2015
LR	0.426588	0.466089	0.915249	0.4567
MS	-2.992388	1.833652	-1.631928	0.2443
LDR	-2.527374	1.134974	-2.226814	0.1558
EXR	-0.216048	0.132690	-1.628218	0.2450
C	170.604879	94.506743	1.805214	0.2128

Source: Data output via E-views 9.0

4.7 Short Run Relationship from ARDL Technique

The nature of relationship between monetary policy measurement and sectorial performance of the real sector was assessed using the ARDL regression approach as against the conventional OLS methodology. The choice of ARDL is predicated on the fact that the variables have different order of integration and ARDL is perfectly suited to handle such. The global utility of Adjusted R-square, f-statistic, Durbin Watson and the relative

statistic of the individual variables were the statistical yardstick for interpretation of the ARDL short run relationship analysis.

Agricultural Sector Contribution to RGDP and Monetary Policy

Table 22 reveals that monetary policy rate (significant), liquidity ratio, loan to deposit ratio and exchange rate have negative relationship with agricultural sector contribution to real gross domestic product, while money supply showed insignificant positive relationship with agricultural sector contribution to real gross domestic product

Table 22: ARDL Regression: Agricultural Sector and Monetary Policy

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ACRGDP(-1)	0.050949	0.099209	0.513549	0.6294
ACRGDP(-2)	-0.039141	0.082805	-0.472689	0.6563
ACRGDP(-3)	0.059049	0.094931	0.622024	0.5612
ACRGDP(-4)	0.128037	0.042439	3.016995	0.0295
MPR	-1.511304	0.317302	-4.762976	0.0050
MPR(-1)	-0.937817	0.221818	-4.227859	0.0083
MPR(-2)	0.273489	0.283818	0.963605	0.3795
MPR(-3)	0.549779	0.303308	1.812608	0.1296
LR	-0.095590	0.100821	-0.948113	0.3866
LR(-1)	-0.435917	0.135799	-3.210027	0.0237
LR(-2)	-0.272200	0.093822	-2.901255	0.0337
LR(-3)	0.406866	0.073610	5.527341	0.0027
LR(-4)	0.409179	0.094481	4.330821	0.0075
MS	0.078677	0.081433	0.966164	0.3783
MS(-1)	0.026645	0.081008	0.328915	0.7555
MS(-2)	0.386350	0.059234	6.522462	0.0013
MS(-3)	0.051114	0.102483	0.498756	0.6391
MS(-4)	-0.554406	0.138928	-3.990610	0.0104
LDR	-0.218031	0.117778	-1.851201	0.1234
LDR(-1)	-0.342943	0.145594	-2.355472	0.0651
LDR(-2)	-0.520827	0.117896	-4.417697	0.0069
EXR	-0.007759	0.040904	-0.189688	0.8570
EXR(-1)	-0.106655	0.059888	-1.780914	0.1350
EXR(-2)	0.152468	0.045475	3.352781	0.0203
EXR(-3)	0.315281	0.046526	6.776437	0.0011
EXR(-4)	-0.521977	0.048064	-10.86002	0.0001
C	116.3686	12.39108	9.391316	0.0002
R-squared	0.995801	Mean dependent var		17.67875
Adjusted R-squared	0.973968	S.D. dependent var		12.30839
S.E. of regression	1.985898	Akaike info criterion		4.041222
Sum squared resid	19.71896	Schwarz criterion		5.277937
Log likelihood	-37.65955	Hannan-Quinn criter.		4.451158
F-statistic	45.60888	Durbin-Watson stat		1.666119
Prob (F-statistic)	0.000232			

Source: Data output via E-views 9.0

. Holding the various tools of monetary policy as proxied by monetary policy rate, liquidity ratio, money supply, loan to deposit ratio and exchange rate

constant, agricultural sector contribution to real gross domestic product rise by 116.36%. A percentage increase in monetary policy rate, liquidity ratio, loan to deposit ratio and exchange rate result in 151.13%, 9.56%, 21.80% and 0.76% reduction in agricultural sector contribution to real gross domestic product, whereas a unit appreciation in money supply improves agricultural sector contribution to real gross domestic product by 8.87%. The adjusted R-square reveals that 97.40% changes in agricultural sector contribution to real gross domestic product was as a result of fluctuations in measurements of possible aims of monetary policy through monetary policy rate, liquidity ratio, money supply, loan to deposit ratio and exchange rate. This is statistically significant with respect to the p-value (0.00) and f-statistic (45.61). The Durbin Watson coefficient of 1.67 is within the acceptable range of no autocorrelation in the model estimated.

Industrial Sector Contribution to RGDP and Monetary Policy

The output in Table 23 shows that there is an insignificant negative relationship between monetary policy rate, loan to deposit ratio and exchange rate and industrial sector contribution to real gross domestic, while insignificant positive relationship between liquidity ratio, money supply and industrial sector contribution to real gross domestic. Keeping monetary policy rate, liquidity ratio, money supply, loan to deposit ratio and exchange rate constant, industrial sector contribution to real gross domestic would be up by ₦302.63 billion. A unit increase in monetary policy rate, loan to deposit ratio and exchange rate, decrease industrial sector contribution to real gross domestic respectively by 24.51%, 195.56% and 42.32%. Industrial sector contribution to real gross domestic would appreciate by ₦86.03% and 135.02% equivalently owing to a percentage increase in monetary policy rate

and money supply. The result in Table 23 depicts the coefficient of the adjusted R-square as 0.270900. This is an insinuation that 27.10% changes in industrial sector contribution to real gross domestic was as a result of joint variation in monetary policy rate, liquidity ratio, money supply, loan ton deposit ratio and exchange rate. From the p-value (0.44) and f-statistic (1.41), monetary policy instruments did not significantly explain the changes in industrial sector contribution to real gross domestic product. The Durbin Watson value of 2.99 dispels no autocorrelation in the estimated output hence leading to the conclusion that the variables in the model are not serially correlated.

Table 23: ARDL Regression: Industrial Sector and Monetary Policy

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ICRGDP(-1)	-0.093392	0.502948	-0.185689	0.8645
ICRGDP(-2)	0.523593	0.785504	0.666569	0.5527
ICRGDP(-3)	-0.612317	0.504687	-1.213259	0.3118
ICRGDP(-4)	-1.078932	0.571457	-1.888038	0.1555
MPR	-0.245059	1.445110	-0.169578	0.8761
MPR(-1)	-3.191316	2.347795	-1.359282	0.2672
MPR(-2)	0.734212	2.010140	0.365254	0.7392
MPR(-3)	-0.059774	2.313867	-0.025833	0.9810
MPR(-4)	-5.094887	4.425634	-1.151222	0.3331
LR	0.860321	0.924608	0.930471	0.4208
LR(-1)	0.650100	1.043354	0.623087	0.5774
LR(-2)	1.048382	1.011788	1.036168	0.3763
LR(-3)	-0.402210	1.106827	-0.363390	0.7404
LR(-4)	0.965656	0.823423	1.172734	0.3255
MS	1.350167	0.991432	1.361835	0.2665
MS(-1)	-0.281194	0.448462	-0.627020	0.5751
MS(-2)	1.686983	0.664795	2.537597	0.0849
MS(-3)	1.713259	1.285946	1.332295	0.2749
LDR	-1.955645	1.115502	-1.753152	0.1779
LDR(-1)	-1.047823	1.253146	-0.836154	0.4644
LDR(-2)	0.744842	0.813512	0.915588	0.4274
LDR(-3)	-0.840953	0.988458	-0.850773	0.4574
LDR(-4)	-2.253590	1.686865	-1.335963	0.2739
EXR	0.423167	0.514725	0.822122	0.4713
EXR(-1)	-1.006036	0.658838	-1.526986	0.2242
EXR(-2)	-0.765128	0.518158	-1.476631	0.2363
EXR(-3)	-0.008924	0.483925	-0.018442	0.9864
EXR(-4)	1.064916	0.664221	1.603255	0.2072
C	302.6327	180.0455	1.680868	0.1914
R-squared	0.929442	Mean dependent var		14.74844
Adjusted R-squared	0.270900	S.D. dependent var		15.82221
S.E. of regression	13.51016	Akaike info criterion		7.490138
Sum squared resid	547.5736	Schwarz criterion		8.818461
Log likelihood	-90.84221	Hannan-Quinn criter.		7.930440
F-statistic	1.411364	Durbin-Watson stat		2.993835
Prob (F-statistic)	0.444968			

Source: Data output via E-views 9.0

Building & Construction Sector Contribution to RGDP and Monetary Policy

As shown in Table 24, insignificant positive relationship was found between liquidity ratio, exchange rate and building and construction sector contribution to real gross domestic product, while monetary policy rate, liquidity ratio and money supply were insignificantly and negatively linked with building and construction sector contribution to real gross domestic product.

Table 24: ARDL Regression: Building & Construction Sector and Monetary Policy

Variable	Coefficient	Std. Error	t-Statistic	Prob.
BCCRGDP(-1)	-0.330315	0.329241	-1.003262	0.4214
BCCRGDP(-2)	-0.215499	0.396182	-0.543938	0.6410
BCCRGDP(-3)	-0.234401	0.464727	-0.504383	0.6641
BCCRGDP(-4)	-0.972402	0.338668	-2.871251	0.1029
MPR	8.721924	3.441341	2.534455	0.1267
MPR(-1)	-3.907505	2.193464	-1.781431	0.2168
MPR(-2)	0.807882	2.330621	0.346638	0.7619
MPR(-3)	-8.608437	2.174637	-3.958563	0.0583
MPR(-4)	-2.258577	3.037894	-0.743468	0.5347
LR	1.260641	1.219746	1.033528	0.4100
LR(-1)	-0.667290	1.340736	-0.497704	0.6680
LR(-2)	1.228192	1.128586	1.088258	0.3901
LR(-3)	-1.081201	1.506804	-0.717546	0.5475
LR(-4)	-1.992885	1.156294	-1.723511	0.2269
MS	1.972766	0.777041	2.538819	0.1264
MS(-1)	1.714785	0.913041	1.878103	0.2012
MS(-2)	0.369117	0.646094	0.571305	0.6254
MS(-3)	-0.719016	0.811466	-0.886070	0.4691
MS(-4)	2.815030	1.665394	1.690308	0.2330
LDR	-0.070743	1.176357	-0.060137	0.9575
LDR(-1)	0.718396	1.875002	0.383144	0.7385
LDR(-2)	0.353833	1.369498	0.258367	0.8203
LDR(-3)	-2.338979	1.124000	-2.080943	0.1729
LDR(-4)	-0.591991	1.121408	-0.527899	0.6503
EXR	-1.015353	0.402804	-2.520710	0.1279
EXR(-1)	1.011276	0.559930	1.806076	0.2127
EXR(-2)	0.136725	0.406860	0.336050	0.7688
EXR(-3)	-0.322360	0.518158	-0.622127	0.5973
EXR(-4)	0.316612	0.403471	0.784720	0.5148
C	181.3169	107.8398	1.681354	0.2347
R-squared	0.947191	Mean dependent var		14.42406
Adjusted R-squared	0.181463	S.D. dependent var		15.49383
S.E. of regression	14.01773	Akaike info criterion		7.220935
Sum squared resid	392.9938	Schwarz criterion		8.595062
Log likelihood	-85.53496	Hannan-Quinn criter.		7.676419
F-statistic	1.236981	Durbin-Watson stat		2.874682
Prob (F-statistic)	0.544650			

Source: Data output via E-views 9.0

Building and construction sector contribution to real gross domestic product would amount to 32% if monetary policy rate, liquidity ratio, money supply, loan to deposit ratio and exchange rate are held constant. Building and construction sector contribution to real gross domestic product would increase

by 873.19%, 126.06% and 197.28% respectively in an event that monetary policy rate, liquidity ratio and money supply rise by a unit. However, the reverse would be the case through depreciation by 7.07% and 101.54% respectively if there is a percentage increase in liquidity ratio and exchange rate. In terms of the adjusted R-squared, monetary policy instruments explained 18.15% changes in building and construction sector contribution to real gross domestic product which is statistically significant as evidenced by the p-value (0.55) and f-statistic (1.24). No issue of autocorrelation in the model as Durbin Watson coefficient of 2.87 is the benchmark of no autocorrelation between the variables in the model.

Wholesale & Retail Trade Sector Contribution to RGDP and Monetary Policy

The result of the nexus between wholesale and retail trade contribution to gross domestic product in Table 25 depicts that monetary policy rate, liquidity ratio, money supply and loan to deposit ratio have insignificant negative relationship with wholesale and retail trade contribution to gross domestic product, whereas wholesale and retail trade was insignificantly and negatively related with exchange rate. Assuming that monetary policy rate, liquidity ratio, money supply, loan to deposit ratio and exchange rate are kept constant, about 320.94% will be the magnitude of increase in wholesale and retail trade contribution to gross domestic product. Wholesale and retail trade contribution to gross domestic product would depreciate 13.44%, 3.07%, 155.92% and 295.49% accordingly only if monetary policy rate, liquidity ratio, money supply and loan to deposit ratio increase by a unit, and a corresponding appreciation by 156.50% if exchange rate rises by a unit. That notwithstanding, monetary policy variables insignificantly explained the variation in wholesale and retail trade contribution to gross domestic product

as revealed by the insignificant p-value (0.15) and f-statistic (6.01). About 82.40% variation in wholesale and retail trade contribution to gross domestic product was attributed to the joint influence of monetary policy rate, liquidity ratio, money supply, loan to deposit ratio and exchange rate. No issue of autocorrelation in the estimated model following the Durbin Watson coefficient of 2.0.

Table 25: ARDL Regression: Wholesale & Retail Trade Sector and Monetary Policy

Variable	Coefficient	Std. Error	t-Statistic	Prob.
WRTCRGDP(-1)	-0.257470	0.489380	-0.526114	0.6513
WRTCRGDP(-2)	-0.902282	0.405597	-2.224578	0.1561
WRTCRGDP(-3)	-0.626799	0.399880	-1.567468	0.2575
WRTCRGDP(-4)	0.905338	0.321568	2.815389	0.1064
MPR	-13.44443	5.378712	-2.499563	0.1296
MPR(-1)	5.135730	2.443902	2.101447	0.1704
MPR(-2)	0.985290	2.531363	0.389233	0.7346
MPR(-3)	7.403767	3.570130	2.073809	0.1738
MPR(-4)	7.938925	3.751411	2.116251	0.1686
LR	-3.066666	1.520296	-2.017151	0.1812
LR(-1)	-1.480044	1.638260	-0.903424	0.4617
LR(-2)	4.520316	1.368745	3.302527	0.0807
LR(-3)	-2.355706	1.678392	-1.403549	0.2956
LR(-4)	3.184603	2.179625	1.461078	0.2815
MS	-1.559184	0.933334	-1.670553	0.2368
MS(-1)	-1.987635	1.263923	-1.572592	0.2564
MS(-2)	2.186981	0.952060	2.297105	0.1484
MS(-3)	-1.453701	0.935755	-1.553506	0.2605
MS(-4)	-2.815780	2.024828	-1.390627	0.2989
LDR	-2.954913	1.470302	-2.009732	0.1822
LDR(-1)	-2.123546	2.430047	-0.873871	0.4743
LDR(-2)	0.508879	1.529342	0.332744	0.7710
LDR(-3)	2.325117	1.256889	1.849898	0.2056
LDR(-4)	-2.510066	1.166448	-2.151887	0.1643
EXR	1.565006	0.920672	1.699851	0.2313
EXR(-1)	-2.561186	1.247034	-2.053822	0.1764
EXR(-2)	0.563649	0.442179	1.274710	0.3305
EXR(-3)	0.723240	0.525155	1.377193	0.3023
EXR(-4)	-0.697142	0.653587	-1.066641	0.3978
C	320.9441	189.1079	1.697148	0.2318
R-squared	0.988646	Mean dependent var		13.61094
Adjusted R-squared	0.824010	S.D. dependent var		30.84949
S.E. of regression	12.94171	Akaike info criterion		7.061200
Sum squared resid	334.9760	Schwarz criterion		8.435327
Log likelihood	-82.97920	Hannan-Quinn criter.		7.516684
F-statistic	6.005052	Durbin-Watson stat		3.501564
Prob (F-statistic)	0.152596			

Source: Data output via E-views 9.0

Service Sector Contribution to RGDP and Monetary Policy

Based on global utility criteria, Table 26 shows that 45.06% variation in service sector contribution to gross domestic product was attributed to of monetary policy rate, liquidity ratio, money supply, loan to deposit ratio and

exchange rate which is insignificant by looking at the p-value (0.33) and f-statistic (1.91). The Durbin Watson value of 2.3 falls within the acceptable range that is devoid of autocorrelation.

Table 26: ARDL Regression: Service Sector and Monetary Policy

Variable	Coefficient	Std. Error	t-Statistic	Prob.
SCRGDP(-1)	-0.701709	0.548647	-1.278981	0.2909
SCRGDP(-2)	-0.261474	0.495995	-0.527170	0.6346
SCRGDP(-3)	-0.311595	0.444284	-0.701341	0.5336
MPR	1.944383	1.246223	1.560221	0.2166
MPR(-1)	-0.372022	0.982791	-0.378536	0.7302
MPR(-2)	-0.299226	0.917910	-0.325987	0.7658
MPR(-3)	0.696576	1.034701	0.673215	0.5490
MPR(-4)	1.020096	1.084722	0.940422	0.4164
LR	-0.098361	0.380152	-0.258741	0.8126
LR(-1)	0.777128	0.484390	1.604345	0.2070
LR(-2)	0.000617	0.345356	0.001786	0.9987
LR(-3)	-1.008777	0.446201	-2.260815	0.1088
LR(-4)	0.303902	0.321160	0.946265	0.4138
MS	0.617688	0.376941	1.638688	0.1998
MS(-1)	0.643726	0.465408	1.383144	0.2606
MS(-2)	-0.236626	0.239421	-0.988327	0.3959
MS(-3)	-0.312616	0.344532	-0.907365	0.4311
MS(-4)	1.313593	0.696996	1.884651	0.1560
LDR	-0.143347	0.399432	-0.358876	0.7435
LDR(-1)	1.093887	0.608938	1.796385	0.1703
LDR(-2)	-0.747524	0.461728	-1.618971	0.2039
LDR(-3)	-0.366028	0.492954	-0.742520	0.5116
LDR(-4)	0.851981	0.383141	2.223671	0.1127
EXR	0.010750	0.164676	0.065282	0.9521
EXR(-1)	0.184079	0.255602	0.720180	0.5235
EXR(-2)	-0.065691	0.192755	-0.340802	0.7557
EXR(-3)	-0.373062	0.203825	-1.830304	0.1646
EXR(-4)	0.384154	0.168037	2.286131	0.1063
C	-90.22033	40.53261	-2.225870	0.1124
R-squared	0.946830	Mean dependent var		18.20844
Adjusted R-squared	0.450579	S.D. dependent var		7.663083
S.E. of regression	5.680100	Akaike info criterion		5.757191
Sum squared resid	96.79062	Schwarz criterion		7.085514
Log likelihood	-63.11506	Hannan-Quinn criter.		6.197493
F-statistic	1.907967	Durbin-Watson stat		2.313955
Prob (F-statistic)	0.330727			

Source: Data output via E-views 9.0

From the individual variables' coefficient analysis, liquidity ratio and loan to deposit ratio have insignificant negative relationship, while monetary policy rate, money supply and exchange rate have insignificant positive relationship with service sector contribution to gross domestic product. Service sector contribution to gross domestic product would be up by a tune of 90.22% when monetary policy rate, liquidity ratio, money supply, loan to deposit ratio and exchange rate are kept constant. Rising monetary policy rate, money supply

and exchange rate by a percentage result in depreciation in service sector contribution to gross domestic product 194.44%, 61.74% and 38.42% respectively, while an equivalent increase in liquidity ratio and loan to deposit ratio would lead to 9.84% and 1.08% appreciation in service sector contribution to gross domestic product respectively.

4.8 Variance Decomposition

Following the determination of the relationship between possible aims of monetary policy and sectorial performance of the real sector, it imperative to ascertain which of the monetary policy variable(s) cause(s) more variation in the sectorial performance. Accordingly, variance decomposition analysis was performed and the output depicted in Tables 27 – 31. The result in Table 27 unveils that money supply was the greatest in explaining variation in agricultural sector's contribution to real gross domestic product. This is hierarchically followed by exchange rate, loan to deposit ratio, monetary policy rate, while liquidity ratio showed the least influence. Changes in agricultural sector's contribution to real gross domestic product were more explained by the variations in agricultural sector's contribution to real gross domestic product itself. Regarding industrial sector's contribution to real gross domestic product, Table 28 shows that liquidity ratio influenced it the most, and subsequently followed by money supply, exchange rate, monetary policy rate and liquidity ratio in that order. However, variation in industrial sector's contribution to real gross domestic product was attributable mainly to changes in industrial sector's contribution to real gross domestic product itself.

Table 27: Variance Decomposition of ACRGDP

Period	S.E.	ACRGDP	MPR	LR	MS	LDR	EXR
1	8.76832	100.0000	0.000000	0.00000	0.00000	0.00000	0.000000
2	9.90487	83.79299	5.618803	3.79101	4.30143	0.15202	2.343754
3	11.9955	57.50587	3.905988	3.93199	17.7447	11.1946	5.716892
4	13.0971	48.45300	10.36204	3.56927	16.2777	14.6482	6.689806
5	13.4545	45.92225	9.937811	6.23625	15.4687	14.1589	8.276130
6	13.8763	43.22679	10.51421	6.62140	14.6650	13.4403	11.53171
7	14.3153	42.08292	10.07479	6.65519	13.7810	12.7351	14.67095
8	14.8070	41.63006	9.423853	7.23728	13.0809	11.9138	16.71412
9	15.3165	40.64061	8.880278	7.69104	12.9497	11.2158	18.62262
10	15.8785	39.12670	8.348454	8.05028	12.9748	10.7912	20.70859

Source: Data output via E-views 9.0

Table 28: Variance Decomposition of ICRGDP

Period	S.E.	ICRGDP	MPR	LR	MS	LDR	EXR
1	13.10685	100.0000	0.000000	0.000000	0.000000	0.000000	0.000000
2	14.31404	84.10395	0.037142	5.700835	2.425508	3.586160	4.146408
3	16.35722	67.72026	1.845038	14.13074	9.381245	3.356304	3.566415
4	17.13900	62.93064	3.863742	16.82035	9.055841	3.489525	3.839904
5	17.32828	62.14136	4.117888	16.49682	8.876102	3.454780	4.913046
6	17.72298	60.54944	5.626521	16.93685	8.485493	3.462657	4.939042
7	17.86630	60.24809	6.170276	16.81078	8.382716	3.415083	4.973053
8	17.91709	60.13095	6.145232	16.72887	8.336500	3.396227	5.262220
9	18.02229	59.82521	6.093131	16.53420	8.243464	3.356695	5.947303
10	18.18511	59.65008	5.998346	16.30388	8.100079	3.297006	6.650611

Source: Data output via E-views 9.0

Table 29: Variance Decomposition of BCCRGDP

Period	S.E.	BCCRGDP	MPR	LR	MS	LDR	EXR
1	16.43849	100.0000	0.000000	0.000000	0.000000	0.000000	0.000000
2	19.01813	74.96917	0.548243	0.893339	4.505182	17.78807	1.296002
3	19.88661	68.56531	2.433923	1.000644	4.555730	21.68593	1.758467
4	20.23640	67.21505	3.858677	1.836711	4.400219	20.97865	1.710690
5	20.37567	66.68255	3.806108	2.394486	4.345573	20.92366	1.847624
6	20.45762	66.18557	3.924529	2.472668	4.370107	20.85924	2.187883
7	20.58998	65.34175	4.558440	2.669212	4.479360	20.66890	2.282339
8	20.65394	65.00034	4.818350	2.701306	4.589259	20.55835	2.332390
9	20.68769	64.86772	4.838035	2.707995	4.619566	20.49135	2.475329
10	20.72802	64.66153	4.819266	2.712693	4.613856	20.41657	2.776086

Source: Data output via E-views 9.0

From Table 29, loan to deposit ratio was the highest in influencing the variation in building and construction sector contribution to real gross domestic product. In the second place is money supply, and closely followed by monetary policy rate, exchange rate and liquidity ratio. As can be seen in Table 30, liquidity ratio was the greatest in causing changes in wholesale and retail sector contribution to real gross domestic product. Thereafter, we have monetary policy rate, loan to deposit ratio, money supply, while exchange rate

remained the least in influencing wholesale and retail sector contribution to real gross domestic product as was in the case of agricultural sector contribution to real gross domestic product.

Table 30: Variance Decomposition of WRTCRGDP

Period	S.E.	WRTCRGDP	MPR	LR	MS	LDR	EXR
1	23.04585	100.0000	0.000000	0.000000	0.000000	0.000000	0.000000
2	28.53136	90.37872	0.876286	3.300530	0.863322	4.580342	0.000796
3	34.70592	64.55037	8.616877	12.41592	5.828761	8.008343	0.579731
4	35.73839	61.88987	10.81008	12.19070	5.843557	8.605735	0.660053
5	36.24867	61.01383	10.68394	12.28221	5.772394	8.970296	1.277324
6	36.56179	59.98059	10.50620	12.08408	5.871905	9.310780	2.246446
7	36.83005	59.11184	10.60677	12.00077	5.826218	9.177129	3.277280
8	37.06165	58.37539	10.51798	11.89360	5.757056	9.073075	4.382890
9	37.34779	57.68569	10.35745	12.00992	5.713489	8.934695	5.298756
10	37.56676	57.07068	10.23708	12.08649	5.685208	8.831530	6.089015

Source: Data output via E-views 9.0

Table 31: Variance Decomposition of SCRGDP

Period	S.E.	SCRGDP	MPR	LR	MS	LDR	EXR
1	6.683063	100.0000	0.000000	0.000000	0.000000	0.000000	0.000000
2	6.942348	94.28229	0.501942	1.952295	0.050396	2.659977	0.553104
3	7.915131	72.72727	18.51557	4.856728	0.520535	2.514511	0.865388
4	8.334674	66.11798	21.81534	7.231471	0.871568	2.403512	1.560137
5	8.406416	64.99751	22.28636	7.534477	0.920497	2.710623	1.550536
6	8.541275	62.96466	24.07671	7.298703	0.904168	3.201912	1.553850
7	8.591924	62.33717	24.19909	7.244144	0.904633	3.672380	1.642575
8	8.641851	61.62041	23.92541	7.181727	0.894525	4.268349	2.109578
9	8.702116	60.78937	23.60770	7.083010	0.893858	4.578181	3.047886
10	8.761466	59.97095	23.28906	6.989576	0.888852	4.706734	4.154829

Source: Data output via E-views 9.0

Finally, in Table 31, monetary policy rate is the weightiest in predicting variation in service sector contribution to real gross domestic product, while in the subsequent order for the remaining reflection of monetary policy tools are, liquidity ratio, loan ton deposit ratio, exchange rate and money supply.

4.9 Impulse Response Function

To determine the variation in sectorial performance of the real sector owing to a unit change in monetary policy tools through monetary policy rate, liquidity ratio, money supply, loan to deposit ratio and exchange rate, the impulse response function was estimated as shown in Tables 32 – 36. From Table 32, agricultural sector contribution to real gross domestic product responds

negatively to any shock in monetary policy rate, loan to deposit ratio and exchange rate in both short and long run (period 1 – 10), but responds negatively in the current year and positively in the subsequent year to any shock in liquidity ratio and money supply in the short run (period 1-10). For industrial sector contribution to real gross domestic product as shown in Table 33, industrial sector contribution to real gross domestic product responds negatively to any shock in monetary policy rate, liquidity ratio, loan to deposit ratio and exchange rate in the short run and long run (period 1-10) and positively to any shock in money supply in short and long run.

Table 32: Impulse Response Function of ACRGDP

Period	ACRGDP	MPR	LR	MS	LDR	EXR
1	8.768317	0.000000	0.000000	0.000000	0.000000	0.000000
2	2.307157	-2.347852	-1.928529	2.054259	0.386184	-1.516369
3	0.734492	0.328572	1.392321	4.616602	-3.994858	-2.434487
4	0.606536	3.486277	0.681729	1.545591	-3.003126	-1.802565
5	-0.125702	0.463853	-2.272985	-0.282764	-0.709866	-1.872512
6	0.323469	-1.501897	-1.208573	-0.487016	-0.498815	-2.687550
7	1.733720	-0.633074	0.942731	0.047748	-0.467302	-2.803643
8	2.243426	-0.124254	1.493045	0.662014	-0.151070	-2.565213
9	2.016996	-0.413752	1.474888	1.303769	-0.437142	-2.653787
10	1.818793	-0.464745	1.501366	1.527632	-0.946441	-2.919617

Source: Data output via E-views 9.0

Table 33: Impulse Response Function of ICRGDP

Period	ICRGDP	MPR	LR	MS	LDR	EXR
1	13.10685	0.000000	0.000000	0.000000	0.000000	0.000000
2	0.729758	-0.275865	-3.417681	2.229275	-2.710673	2.914730
3	-2.978125	2.204644	-5.111502	4.486720	1.277626	-1.023033
4	-1.914266	2.532391	-3.406023	1.225063	1.127048	-1.318062
5	1.317438	1.007568	0.354832	0.226062	-0.351180	-1.863553
6	1.896551	2.303993	1.914279	0.032862	-0.709019	-0.872566
7	1.458196	1.422205	0.679272	0.323608	-0.157319	-0.600395
8	0.847979	0.178200	-0.206431	0.063301	-0.039260	-1.009298
9	1.131490	-0.251206	-0.013215	0.113977	-0.000540	-1.556958
10	1.716917	-0.213932	-0.461625	0.108703	0.022380	-1.635985

Source: Data output via E-views 9.0

As revealed in Table 34, building and construction sector contribution to real gross domestic product responds positively to any change in liquidity ratio and currency in circulation both in short and long run but responds negatively to shocks in capital monetary policy rate and money supply in short and long run

(period 1 – 10). It respond negatively to liquidity ratio and loan to deposit ratio only in the short term but positively in the long run. Furthermore, building and construction sector contribution to real gross domestic product responds negatively to shocks in exchange rate both in short and long run. With the inferences from Table 35, wholesale and retail trade sector contribution to real gross domestic product responds negatively to any shock in exchange rate in both short and long run (period 1 – 10). On the other hand, it responds negatively to liquidity ratio, money supply and loan to deposit ratio in short term basis but positively in the long run. Wholesale and retail trade sector contribution to real gross domestic product responds positively to monetary policy rate in short run but negatively in the long run.

Table 34: Impulse Response Function of BCCRGDP

Period	BCCRGDP	MPR	LR	MS	LDR	EXR
1	16.43849	0.000000	0.000000	0.000000	0.000000	0.000000
2	-0.965228	1.408168	-1.797530	4.036677	-8.021069	-2.165064
3	0.069460	2.764540	0.852178	1.312295	-4.628759	-1.505603
4	2.023169	2.485180	-1.887917	0.050289	0.383507	-0.226133
5	1.261388	0.003521	-1.555504	0.148385	0.978944	-0.815638
6	0.389076	0.789282	0.638221	0.498086	0.656151	-1.218958
7	-0.136462	1.703137	0.983660	0.837024	0.571276	-0.720634
8	-0.516852	1.108592	0.455316	0.766137	0.271317	-0.523176
9	-0.582590	0.389205	0.257531	0.440164	0.010609	-0.802680
10	-0.444582	0.013264	0.255772	0.229420	0.144961	-1.154797

Source: Data output via E-views 9.0

Table 35: Impulse Response Function of WRTCRGDP

Period	WRTCRGDP	MPR	LR	MS	LDR	EXR
1	23.04585	0.000000	0.000000	0.000000	0.000000	0.000000
2	-14.30407	2.670826	-5.183395	-2.650996	6.106206	-0.080500
3	6.464698	9.831433	11.07621	7.948567	-7.692518	-2.641285
4	-3.601049	5.854870	-2.480653	-2.104352	-3.668057	1.203139
5	-3.350169	-1.521011	-2.383402	1.100689	-2.819828	-2.890189
6	-0.313532	0.244626	-0.389254	-1.626727	-2.568379	-3.639518
7	0.156166	-1.852714	-1.117583	-0.732333	-0.141935	-3.798032
8	0.026490	-0.771804	0.762736	-0.217030	0.375890	-3.968268
9	1.675874	-0.017018	2.038336	0.786165	0.039862	-3.702460
10	0.885177	0.016742	1.746648	0.733580	0.098777	-3.467253

Source: Data output via E-views 9.0

Table 36: Impulse Response Function of SCRGDP

Period	SCRGDP	MPR	LR	MS	LDR	EXR
1	6.683063	0.000000	0.000000	0.000000	0.000000	0.000000
2	0.881556	0.491850	-0.970016	0.155849	-1.132258	0.516309
3	0.350212	3.370157	-1.449750	0.549384	0.541586	0.524962
4	0.605733	1.885349	-1.407396	0.528525	0.307115	0.735947
5	-0.047923	0.771279	-0.548617	0.212238	-0.495879	0.109330
6	-0.050191	1.347400	-0.014127	0.095531	-0.648356	-0.194566
7	0.288407	0.547067	-0.151857	0.090494	-0.612446	-0.281037
8	-0.032712	0.061856	-0.125364	0.015329	-0.690418	-0.602411
9	-0.121502	0.097385	-0.017642	0.094046	-0.528432	-0.855921
10	0.042539	0.009006	0.041097	0.073632	-0.382273	-0.938784

Source: Data output via E-views 9.0

From Table 36, service sector contribution to real gross domestic product responds negatively to shocks in liquidity ratio, loan to deposit ratio and exchange rate in short and long run basis. On the other hand, service sector contribution to real gross domestic product responds positively to any shock in monetary policy rate and money supply in short and long run.

4.10 Granger Causality Analysis

To determine the effect of monetary policy and its targets on sectorial performance of the real sector: agriculture, industrial, building & construction, wholesale & retail trade and service sector, the granger causality analysis was performed. The choice of granger causality analysis was based on the fact that it is structured to detect a variable that can predict or cause change in another which is obviously not the case in the OLS technique which only ascertains the nature of relationship between variables. Two variables may correlated but may not have any effect or cause changes on the other. From the result in Table 37, there is a unidirectional causal relationship between money supply and agricultural contribution to real gross domestic product at 5% significance level. The causality runs from money supply to agricultural contribution to real gross domestic product. This implies that money supply has significant effect on agricultural contribution to real gross domestic product. There was no empirical evidence to show that monetary policy rate, liquidity ratio, loan

to deposit ratio and exchange rate have significant effect on agricultural contribution to real gross domestic product.

Table 37: Granger Causality Result for Monetary Policy Rate and Agricultural Sector

Null Hypothesis:	Obs	F-Statistic	Prob.	Remarks
MPR does not Granger Cause ACRGDP	35	2.47256	0.1257	No Causality
ACRGDP does not Granger Cause MPR		0.00296	0.9569	No Causality
LR does not Granger Cause ACRGDP	35	0.40916	0.5270	No Causality
ACRGDP does not Granger Cause LR		0.10043	0.7534	No Causality
MS does not Granger Cause ACRGDP	35	4.11287	0.0500	Causality
ACRGDP does not Granger Cause MS		0.11385	0.7380	No Causality
LDR does not Granger Cause ACRGDP	35	0.17811	0.6758	No Causality
ACRGDP does not Granger Cause LDR		1.43963	0.2330	No Causality
EXR does not Granger Cause ACRGDP	35	2.23447	0.1448	No Causality
ACRGDP does not Granger Cause EXR		0.69762	0.4098	No Causality

Source: Data output via E-views 9.0

Table 38: Granger Causality Result for Liquidity Ratio and Industrial Sector

Null Hypothesis:	Obs	F-Statistic	Prob.	Remarks
MPR does not Granger Cause ICRGDP	35	3.65666	0.0648	No Causality
ICRGDP does not Granger Cause MPR		0.20862	0.6509	No Causality
LR does not Granger Cause ICRGDP	35	0.71566	0.4039	No Causality
ICRGDP does not Granger Cause LR		0.41979	0.5217	No Causality
MS does not Granger Cause ICRGDP	35	1.99258	0.1677	No Causality
ICRGDP does not Granger Cause MS		0.93634	0.3405	No Causality
LDR does not Granger Cause ICRGDP	35	0.09650	0.7581	No Causality
ICRGDP does not Granger Cause LDR		0.02020	0.8879	No Causality
EXR does not Granger Cause ICRGDP	35	0.36771	0.5485	No Causality
ICRGDP does not Granger Cause EXR		4.72231	0.0373	Causality

Source: Data output via E-views 9.0

With regard to industrial sector contribution to real gross domestic product, it was clear in Table 38 that there is unidirectional relationship between exchange rate and industrial contribution to real gross domestic product at a significance level of 5%. It was vivid that industrial contribution to real gross domestic product has significant effect on exchange rate. Monetary policy instruments; monetary policy rate, liquidity ratio, money supply, loan to deposit ratio and exchange rate have no significant effect on industrial sector contribution to real gross domestic product. As can be seen in Table 39, there is a unidirectional relationship between loan to deposit ratio and building and construction contribution to real gross domestic product. This suggests that loan to deposit ratio has significant effect on building and construction contribution to real gross domestic product. Building and construction

contribution to real gross domestic product is not affected by change in monetary policy rate, liquidity ratio, money supply and exchange rate.

Table 39: Granger Causality Result for Money Supply and Building & Construction

Null Hypothesis:	Obs	F-Statistic	Prob.	Remarks
MPR does not Granger Cause BCCRGDP	35	1.56946	0.2194	No Causality
BCCRGDP does not Granger Cause MPR		0.88684	0.3534	No Causality
LR does not Granger Cause BCCRGDP	35	0.36292	0.5511	No Causality
BCCRGDP does not Granger Cause LR		0.88082	0.3550	No Causality
MS does not Granger Cause BCCRGDP	35	3.97277	0.0548	No Causality
BCCRGDP does not Granger Cause MS		0.42509	0.5191	No Causality
LDR does not Granger Cause BCCRGDP	35	4.63779	0.0389	Causality
BCCRGDP does not Granger Cause LDR		0.06565	0.7994	No Causality
EXR does not Granger Cause BCCRGDP	35	0.28563	0.5967	No Causality
BCCRGDP does not Granger Cause EXR		0.25502	0.6170	No Causality

Source: Data output via E-views 9.0

With inferences from Table 40, there is a presence of unidirectional relationship at 5% level of significance between monetary policy rate and wholesale and retail trade contribution to real gross domestic product. This is to say that monetary policy rate has significant effect on wholesale and retail trade contribution to real gross domestic product. There is also a one way relationship between wholesale and retail trade contribution to real gross domestic product and money supply growth. Invariably, wholesale and retail trade contribution to real gross domestic product significantly affects growth in money supply in Nigeria.

Table 40: Granger Causality Result for Loan to Deposit Ratio and Wholesale & Retail Trade

Null Hypothesis:	Obs	F-Statistic	Prob.	Remarks
MPR does not Granger Cause WRTCRGDP	35	4.18290	0.0491	Causality
WRTCRGDP does not Granger Cause MPR		0.80687	0.3758	No Causality
LR does not Granger Cause WRTCRGDP	35	1.6E-05	0.9969	No Causality
WRTCRGDP does not Granger Cause LR		0.00653	0.9361	No Causality
MS does not Granger Cause WRTCRGDP	35	0.90630	0.3482	No Causality
WRTCRGDP does not Granger Cause MS		6.25777	0.0177	Causality
LDR does not Granger Cause WRTCRGDP	35	0.75492	0.3914	No Causality
WRTCRGDP does not Granger Cause LDR		2.2E-05	0.9963	No Causality
EXR does not Granger Cause WRTCRGDP	35	0.41798	0.5226	No Causality
WRTCRGDP does not Granger Cause EXR		0.41798	0.8177	No Causality

Source: Data output via E-views 9.0

Finally, on the service sector linkage with monetary policy, Table 41 reveals that there is a unidirectional relationship between monetary policy rate, money supply and service sector contribution to real gross domestic product at

significance level of 5%. The result implies that monetary policy rate and money supply as instruments of monetary policy have significant effect on service sector contribution to real gross domestic product, while liquidity ratio, loan to deposit ratio and exchange rate have no significant effect on service sector contribution to real gross domestic product.

Table 41: Granger Causality Result for Monetary Policy and Service Sector

Null Hypothesis:	Obs	F-Statistic	Prob.	Remarks
MPR does not Granger Cause SCRGDP	35	9.21679	0.0047	Causality
SCRGDP does not Granger Cause MPR		0.10177	0.7518	No Causality
LR does not Granger Cause SCRGDP	35	0.00020	0.9887	No Causality
SCRGDP does not Granger Cause LR		0.00653	0.9539	No Causality
MS does not Granger Cause SCRGDP	35	4.46083	0.0426	Causality
SCRGDP does not Granger Cause MS		2.95627	0.0952	No Causality
LDR does not Granger Cause SCRGDP	35	3.23625	0.0815	No Causality
SCRGDP does not Granger Cause LDR		0.28312	0.5983	No Causality
EXR does not Granger Cause SCRGDP	35	0.46801	0.4988	No Causality
SCRGDP does not Granger Cause EXR		0.18492	0.6701	No Causality

Source: Data output via E-views 9.0

4.11 Test Hypotheses

Decision Rule: If the p-value of f-statistic in granger causality test is less than 0.05, the null hypothesis is rejected. On the other hand, the null hypothesis is accepted if the p-value of f-statistic in granger causality test is above 0.05. The application of the decision rule resulted in the remarks in Table 42 – 46 which depicts the rejection of the null hypotheses/acceptance of the alternative hypotheses.

Restatement of Hypotheses

Hypothesis One

H_0: Monetary policy rate has no significant effect on agricultural sector output in Nigeria.

H_1: Monetary policy rate has significant effect on agricultural sector output in Nigeria.

Table 42: Test of Hypothesis One

Variables	Obs.	f-statistic	P-value	Decision
MPR does not Granger Cause ACRGDP	35	2.47256	0.1257	
ACRGDP does not Granger Cause MPR		0.00296	0.9569	Accept H_0

Source: Granger Causality Output in Table 38

Table 42 dispels that the p-value of the f-statistic for monetary policy rate is insignificant at 5% level of significance. This is an indication that causality

does not flow from monetary policy rate to agricultural sector output. This implies that monetary policy rate has no significant effect on agricultural sector output. In effect, the null hypothesis that monetary policy rate has significant effect on agricultural sector output in Nigeria is accepted, while the alternate hypothesis rejected.

Hypothesis Two

H_0: Liquidity ratio has no significant effect on industrial sector output in Nigeria.

H_1: Liquidity ratio has significant effect on industrial sector output in Nigeria

Table 43: Test of Hypothesis Two

Variables	Obs.	f-statistic	P-value	Decision
LR does not Granger Cause ICRGDP	35	0.71566	0.4039	
ICRGDP does not Granger Cause LR		0.41979	0.5217	Accept H_0

Source: Granger Causality Output in Table 39

As can be seen in Table 43, there is no unidirectional relationship between liquidity ratio and industrial sector contribution to real gross domestic owing to the fact that causality does not flow from liquidity ratio to industrial sector output. This suggests that liquidity ratio has no significant effect on industrial sector output in Nigeria. In the light of this, the hypothesis that liquidity ratio has no significant effect on industrial sector output in Nigeria is accepted, and the alternate hypothesis rejected.

Hypothesis Three

H_0: Money supply has no significant effect on building and construction sector output in Nigeria.

H_1: Money supply has significant effect on building and construction sector output in Nigeria.

Table 44: Test of Hypothesis Three

Variables	Obs.	f-statistic	P-value	Decision
MS does not Granger Cause BCCRGDP	35	3.97277	0.0548	
BCCRGDP does not Granger Cause MS		0.42509	0.5191	Accept H_0

Source: Granger Causality Output in Table 40

The causality result in Table 44 depicts that causality flows does not flow from money supply to building and construction sector output in Nigeria. By implication, money supply has no significant effect on building and construction sector output in Nigeria. In this regard, the null hypothesis that money supply has no significant effect on building and construction sector output in Nigeria is accepted, while the alternate hypothesis is rejected.

Hypothesis Four

H_0: Loan to deposit ratio has no significant effect on whole and retail trade sector output in Nigeria.

H_1: Loan to deposit ratio has significant effect on whole and retail trade sector output in Nigeria.

From the causality output in Table 45, it is vivid that loan to deposit ratio has no significant effect on whole and retail trade sector output in Nigeria.

Table 45: Test of Hypothesis Four

Variables	Obs.	f-statistic	P-value	Decision
LDR does not Granger Cause WRTCRGDP	35	0.75492	0.3914	
WRTCRGDP does not Granger Cause LDR		2.2E-05	0.9963	Accept H_0

Source: Granger Causality Output in Table 41

Therefore the hull hypothesis that loan to deposit ratio has no significant effect on whole and retail trade sector output in Nigeria is accepted, while the alternate hypothesis rejected.

Hypothesis Five

H_0: Exchange rate has no significant effect on service sector output in Nigeria.

H_1: Exchange rate has significant effect on service sector output in Nigeria.

Table 46: Test of Hypothesis Five

Variables	Obs.	f-statistic	P-value	Decision
EXR does not Granger Cause SCRGDP	35	16.1520	0.0003	
SCRGDP does not Granger Cause EXR		4.63007	0.0391	Reject H_0

Source: Granger Causality Output in Table 42

The causality outcome in Table 46 discloses that there is a two way relationship between exchange rate and service sector output. Put differently,

exchange rate has significant effect on service sector output in Nigeria based on the fact that the p-value of exchange rate significant at 5% level of significance. Thus, the null hypothesis that exchange rate has no significant effect on service sector output in Nigeria is rejected, whereas the alternate hypothesis is accepted.

4.12 Discussion of Findings

The result of this study clearly brings to the fore the inadequacy of exploring the effect of monetary policy variables on real sector of the economy on an aggregate basis. This is in view of the varying statistical significance of the different monetary policy proxies in relation to influencing outputs in the various sectors of the real economy with dire consequences for policy inferences and implementation.

Regarding the result of the ARDL co-integration analyses, the negative relationship between monetary policy rate and agricultural sector output agrees the works of Muroyiwa, Sitima, Sibanda and Mushunje (2014) but supports the studies of Ajudua, Ojima and Okonkwo (2015), Akintude, Adesope and Okoruwa (2013), Ogunbadejo and Oladipo (2016) and Nampewo (2014). Furthermore, the positive relationship between money supply and agricultural sector output is an affirmation of Muroyiwa, Sitima, Sibanda and Mushunje (2014) but not in accord with Ogunbadejo and Oladipo (2016) and Ajudua, Ojima and Okonkwo (2015).

Furthermore, the core monetary policy tools that affect aggregate credit in the economy (i.e. monetary policy rate) has negative relationship with agricultural sector contribution to real gross domestic product. This is not unconnected with the fact that cash reserve ratio and monetary policy rate set by the Central Bank of Nigeria over the years have been considerably high

consequently limiting the ability of banks to extend credits to the real sector (including agricultural sector). It is also instructive to note that the finding of a negative relationship between exchange rate and agricultural sector contribution to real gross domestic product is in tandem with reality especially considering difficulties encountered in accessing foreign exchange at competitive rates for purchase of agricultural equipment and inputs as well as high interest rate associated with borrowing from deposit money banks by farmers

The foregoing perhaps must have informed the interventionist programmes of the Central Bank of Nigeria towards the promotion of agriculture in the economy by making credits available particularly to farmers at concessionary interest rates. A few of the programmes include but not limited to the Green Revolution, Operation Feed the Nation (OFN), Commercial Agriculture Credit Scheme (CACS), Agricultural Credit Guarantee Funds (ACGF), and most recently, the Accelerated Agricultural Development Scheme (AADS). These are aimed at enabling farmers' access credits at below market interest rate with a view to significantly enhancing agricultural output.

Agricultural sector output was sensitive to only one monetary policy variables –exchange rate, while the other proxies were insignificant in their influence. This further beckons on the monetary authority to pursue policies aimed at ensuring availability of foreign exchange and credits to various players within the agricultural sector at competitive rates.

The negative and insignificant relationship of exchange rate with industrial output reinforces the devastating role exchange rate depreciation

over the years have had on the industrial sector in Nigeria. The exchange rate crisis of 2016 constrained many companies within the sector to close down operations while others like Erisco Food Ltd relocated its production plant from Nigeria to Ghana. The negative linkage between exchange rate and industrial performance is in tandem with the researches of Kutu and Ngalawa (2016), Imoughele and Ismaila (2014), Ubi, Effiom and Eyo (2012) and Igbinedion and Ogbeide (2016) but at variance with Owolabi and Adegbite (2014) and Gichuhi (2016).

On the other hand, money supply displayed positive relationship with industrial performance which is in line with Imoughele and Ismaila (2014) and Okonkwo, Egbulonu and Emerenini (2015). Furthermore, industrial sector output demonstrates significant positive relationship with interest rate fluctuations thereby refuting the findings of Mehdi and Reza (2011), Gichuhi (2016), Imoughele and Ismaila (2014), Owolabi and Adegbite (2014), Ubi, Effiom and Eyo (2012), Okonkwo, Egbulonu and Emerenini (2015) and Igbinedion and Ogbeide (2016).

The building and construction sector is the most responsive to changes in monetary policy in the sense that it is sensitive to money supply and exchange rate. Additionally, the sector's positive relationship with monetary policy rate and money supply also suggests that construction activities in Nigeria feels the effect of monetary policies of the Central Bank of Nigeria through these variables. Although monetary policy rate is positively related to building and construction sector output, it is however not a significant relationship. It could be adduced that interest rate is not an effective tool that can influence the prices and building and construction materials in the country.

This is in line with the findings of Bredin, Reilly and Stevenson (2007) and Kalu, Gyang, Aliagha, Alias and Joachin (2015) but in contrast to those of Xu and Chen (2012) and Liang and Cao (2008) that earnings from real estate in China are greatly affected in interest rate variation.

The analysis of the wholesale and retail sector depicts that monetary policy announcement of the CBN is significantly transmitted through exchange rate variation. This is not unconnected with the fact that the bulk of goods in this sector is mostly imported and not locally manufactured hence the inevitable dependence on foreign exchange. It also noteworthy that the monetary policy stance of the Central Bank of Nigeria through cash reserve ratio, money supply, interest rate and credit to private sector does not significantly determine activities in the wholesale and retail sector.

The service sector is significantly influenced by exchange rate and there exist a significant positive and significant relationship with monetary policy rate. This is to say that exchange rate is one of the ultimate target of monetary policy affect service sector performance in Nigeria. This is expected because Nigeria imports most of her professional services thus subjected to exchange rate shocks. This is in contrast to Laokulrach (2013) that monetary policy does not affect service sector employment in Thailand rather it is supply side policies and socioeconomic factors.

The observed signs of the monetary policy variables were interpreted based on the supposed relationship of these variables and sectorial performance of the economy in accordance with the theoretical framework postulation. The observed signs of the explanatory variables are presented in Tables Table 47 – 51.

Table 47: Agricultural Sector

Independent Variables	Supposed Signs	Observed Signs	Remarks
MPR	-	-	Accepted
LR	-	-	Accepted
MS	+	+	Accepted
LDR	+	-	Rejected
EXR	-	-	Accepted

Source: ARDL Regression Result in Table 22

Table 48: Industrial Sector

Independent Variables	Supposed Signs	Observed Signs	Remarks
MPR	-	-	Accepted
LR	-	+	Rejected
MS	+	+	Accepted
LDR	+	-	Rejected
EXR	-	+	Rejected

Source: ARDL Regression Result in Table 23

Table 49: Building and Construction Sector

Independent Variables	Supposed Signs	Observed Signs	Remarks
MPR	-	+	Rejected
LR	-	+	Rejected
MS	+	+	Accepted
LDR	+	-	Rejected
EXR	-	-	Accepted

Source: ARDL Regression Result in Table 24

Table 50: Wholesale and Retail Trade Sector

Independent Variables	Supposed Signs	Observed Signs	Remarks
MPR	-	-	Accepted
LR	-	-	Accepted
MS	+	-	Rejected
LDR	+	-	Rejected
EXR	-	+	Rejected

Source: ARDL Regression Result in Table 25

Table 51: Service Sector

Independent Variables	Supposed Signs	Observed Signs	Remarks
MPR	-	+	Rejected
LR	-	-	Rejected
MS	+	+	Accepted
LDR	+	-	Rejected
EXR	-	+	Rejected

Source: ARDL Regression Result in Table 26

CHAPTER FIVE
SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.1 Summary of Findings

This study examined the effect of monetary policy on real sector of the Nigerian economy from 1981 to 2016. Specifically, the effect of monetary policy rate, liquidity ratio, money supply, loan to deposit ratio and exchange rate on agricultural, industrial, building & construction, wholesale & retail trade and service sector. The findings revealed the following:

1. Monetary policy rate has no significant effect on agricultural sector output. Monetary policy rate has a significant negative relationship with agricultural sector output.
2. Liquidity ratio has no significant effect on industrial sector performance. There is a positive relationship between liquidity ratio and industrial sector output.
3. Money supply has no significant effect on building and construction output. Money supply is positively related with building and construction output.
4. Loan to deposit ratio has no significant affect the wholesale and retail trade sector of the real economy. The wholesale and retail trade sector is negatively associated with loan to deposit ratio.
5. Service sector is affected by changes in exchange rate as a tool of monetary policy, while at the same time, there is a positive relationship between exchange rate and activities in the service sector of the economy.

5.2 Conclusion

The real economy of any country is vehemently affected by any adjustment in monetary policy by the Central Bank as would be reflected in production and

prices. Different sectors in the real economy responds differently to monetary policy changes. The monetary policy of the Central Bank of Nigeria has been adjudged to have not achieved its goals owing to policy inconsistencies of various administration. As a recent study, the sectorial effects of monetary policy adjustments and its aims through monetary policy rate, liquidity ratio, money supply, loan to deposit ratio and exchange rate were empirical examined. It is evident from the outcome of this study that the Central Bank of Nigeria has failed to utilize monetary policy to stimulate productivity in the different sectors of the real economy despite the various programme and schemes implemented over the years to support her monetary policies. This study concludes that agricultural, industrial, building & construction, wholesale & retail trade and services sector of the real economy differently respond and affected by monetary policy adjustments.

5.3 Recommendations

In line with the findings of the sectorial effects of monetary policy adjustment, the following recommendations are put forward for consideration and possible implementation by the concerned authorities:

1. There should be consistency in policy objectives of the CBN. Policy inconsistency often sends the wrong signal to stakeholders in agricultural sector and prevent the sector's long term capital investments that could endanger increased productivity in the agricultural sector.
2. To improve industrial sector contribution to real gross domestic product, the CBN should ensure policies geared towards increasing supply of foreign exchange to gauge the negative effect associated with exchange rate risk in domestic product. This may include increasing production for exports, increasing foreign market access, promoting increased local

demand for substitutes of imported consumer and investment goods and services.

3. To minimize the negative effect of monetary policy adjustment on building and construction sector which influences building and construction materials, monetary policy requires a broader view to policy objectives, with greater priority accorded to output growth and development alongside control of inflation and interest rate.
4. To improve while and retail trade sector characterized by small and medium enterprises to real gross domestic product, downward review of monetary policy rate which ultimately affects interest rate/cost of fund, stability in exchange rate and stability in prices through inflation targeting are encouraged.
5. The service sector receives benefits from trade openness. Tourism and hospitality are main subsections generating income in the service sector. Stability in the exchange rate, inflation targeting and promoting attractive places would attract foreign exchange from tourists. Finding new markets for the tourism and hospitality sector through low interest rate would encourage public – private partnership will in no small measure improve the service sector contribution to real gross domestic product.

5.4 Contribution to Knowledge

To the best of my knowledge based on internet search, this is the newest study on the sectorial effect of monetary policy using up to date on the relevant variables and applying a superior ARDL econometric modelling. In this regard, it is a contribution to knowledge in the subject area. Again, this study captured the core monetary policy tools (monetary policy rate, loan to deposit ratio and liquidity ratio) as well as the possible aims of this tools (stability in

money supply and exchange rate) which were obviously lacking in previous empirical studies.

5.5 Suggestions for Further Research

The effect of possible aims of monetary policy on real sector of the Nigerian economy was ascertained in this study using annual time series and up to date data. However, there are some defects which can be addressed in future studies. First this study used only annual data, the use of quarterly data or monthly is suggested for future research. Secondly, this study covered a period of twenty seven years, future studies should go beyond the period covered in this study to provide large number of observation which will validate the result of this current study.

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