NEAR EAST UNIVERSITY

GRADUATE SCHOOL OF SOCIAL SCIENCES

DEPARTMENT OF ECONOMICS

THE IMPACT OF MONEY SUPPLY AND EXCHANGE RATE ON THE PERFORMANCE OF MANUFACTURING SECTOR IN NIGERIA

(1988 – 2013)

MASTER THESIS

By

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THESIS SUPERVISOR: Assoc. Prof. Dr. Erdal GURYAY

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DECLARATIONS

I hereby declare that all information contained in this document has been obtained and presented in accordance with the academic rules and ethical conduct of Near East University. I also declare that, as required by these rules and conduct, I have fully cited and referenced all materials used in this work.

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All Thanks and praises are due to Allah alone the exalted; Lord of the world, with whose help every achievement becomes possible. Blessings and peace be upon His Messenger and Prophet Muhammad (S.A.W), his family and companions, and all those who follow their footsteps until the last day.

First and foremost, I would like to express special thanks and gratitude to my supervisor **Assoc. Prof. Dr. Erdal GURYAY** who, despite his tight schedules and other personal engagements have the time to offer guidance and the necessary corrections which put the work in its present standard. I remain grateful to my able supervisor Sir. My sincere

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Deep appreciation is extended to **Jigawa State University Kafin Hausa** in particular and the Jigawa State Government in general, for awarding me with the scholarship to study in Near East University Cyprus. The contributions of relatives and friends towards the production of this work are also gratefully acknowledged.

DEDICATION

The work is dedicated with love to my late father ***Malam Hussaini Yakubu*** and my aged Mum ***Hajiya Fatima Umar.*** I pray that Almighty Allah will reward them with Jannatul Firdaus. Ameen

Abstract

The study examines the impact of money supply and exchange rate on manufacturing sector performance in Nigeria using quarterly data from 1988Q1 to 2013Q4 sourced from the Central Bank of Nigeria. Although theoretical literature provides a consistent relationship between these monetary variables and output, empirical evidences from Nigeria and other developing countries does not provide such a consistent relationship. A vector error correction model (VECM) was employed to empirically access the impacts of these variables on manufacturing output. Before estimating the model a unit root test was conducted in order to establish the stationarity of our variables using ADF and PP tests. The result shows that, our variables are stationary at first difference which paves way for cointegration analysis. The results of Cointegration test suggest that, there is a long run relationship among the variables. Having confirmed the long run relationship in the data, we estimated the model using VECM. The error correction term, which measure the speed of adjustment among the variables shows that 65% of the disequilibrium are corrected the following period. While our result from the normalized cointegration equation shows the existence of positive long run relationship between credit to the private sector, exchange rate and the manufacturing output in Nigeria. The long run coefficient of credit and lending rate also confirms with theoretical expectations and are in conformity with the findings of other studies. The significant negative effect of lending rate on the manufacturing sector shows that, credit is still costly to access by the manufacturers. The coefficient of the dummy variable also has the correct sign (positive) and is significant at 1% which implies that the macroeconomic measures adopted by the government to improve the productivity of the manufacturing sector has positive effect. Thus, we conclude that both monetary and exchange rate policies in Nigeria were not successful in stimulating significant growth in the manufacturing sector as expected. Hence, the need for a review of the current exchange rate policy towards appreciation rather than depreciation as the sector depends heavily on the importation of equipments, machineries as well as most of its raw materials and a monetary discipline that will restore the value of the naira.

Keywords: Money Supply, Exchange Rate, Manufacturing Sector and Vector Error Correction Model

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LIST OF ACRONYMS

ADF Augmented Dickey Fuller

CBN Central Bank of Nigeria

CPC Independent Corrupt Practices Commission

CPS Credit to Private Sector

EP Export Promotion

EXR Exchange Rate

FDI Foreign Direct Investment

GDP Gross Domestic Product

IMF International Monetary Fund

IPC Investment Promotion Commission

ISI Import Substitution Industrialization

LAB Labour Force

MGDP Manufacturing Sector GDP

MNCs Multinational Corporations

MSO Manufacturing Sector Output

MSS Money Supply

PLR Prime Lending Rate

PP Test Philips Perron Test

PPP Purchasing Power Parity

QTM Quantity Theory of Money

TNCs Transnational Corporations

VAR Vector Auto Regression

VECM Vector Error Correction Model

CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND TO THE STUDY

In a modern economy, the manufacturing sector has a very crucial and dynamic role to play particularly in developing countries were the quest for transformation is at the centre of economic policies. The manufacturing sector is a leading sector in both the developed and even growing economies in many respect, for instance it serve as an avenue of improving productivity with regard to reducing import and expanding export, foreign exchange generation, employment generation and improving per capita income. Furthermore, the manufacturing sector at faster rate than any other sector of an economy creates investment capital and provides more effective and wider linkage across sectors of the economy. Although in some economies it has been overtaken by services sector, but yet the manufacturing sector is recognised in terms of its contribution to the Gross Domestic Product and employment generation.

In Nigeria however, the agricultural sector has been the dominant sector of the economy and has accounted for major shares of GDP, source of government revenue, source of foreign earnings and major employer of labour before and immediately after independence. In it is effort to diversify the economy, the government after independence has initiated efforts to industrialize the economy through the adoption of an import substitution strategy in which some light manufacturing activities that are mostly assembly related were established, together with some agro-based light manufacturing units in vegetable oil extraction, tobacco, etc. until late 1970s when the import substitution strategy came to a halt with the implementation of liberal importation policy that result to high importation of finished goods at the expense of domestic products, the private sector is the prime mover of manufacturing activities with an encouraging performance.

The liberal trade policies of the 1970s and early 1980s discourage manufacturing activities as the local industries cannot compete with foreign ones and this result to a decrease in the contribution of manufacturing sector output. To convert the negative economic fortunes in the country in terms of declining output, galloping inflation, increasing unemployment, high poverty incidence and worsening balance of payment condition, the government in 1982 embark on austerity measures. But this measure was unable to convert the ugly phenomenon and has achieved little in terms of boosting manufacturing activities. The government in 1986 embark on a comprehensive structural adjustment programme which emphasize on expenditure switching policies and emphasize on the private sector as an engine of growth through

privatization and commercialization of public owned enterprises (NCEM, 2008). The policy thrust of the Structural Adjustment Programme (SAP) was to redirect the economy from an inward looking import substitution to an outward looking export promotion strategy and use exchange rate as the final policy instrument.

Under the SAP a strong attempt was made to revitalize the manufacturing sector through monetary and fiscal incentives that shift emphasis to increased domestic sourcing of inputs. The foreign exchange was also deregulated in order to make non-oil export particularly manufacturing more competitive. Before the adoption of the SAP in 1986 which result to switch in foreign exchange management from fixed to a managed floating, one US dollar exchanged for 77 kobo. But when SAP was implemented later in the year, the dollar exchanged for 1.76 naira and this trend has since then been sustained with the dollar continually appreciating against the Naira as 5.35 naira was exchanged for 1 dollar in 1988, 21.88 naira in 1998, 132.56 naira in 2008 and as of April 2014, 165.10 naira exchanged for one USD. This and other policies of the SAP have brought about a modest revival in the growth of the sector for a short period. The growth was on average about 8.1% between 1987 and 1992. But in the long run, this resulted to massive escalation of input prices that has significantly increased cost of production to unbearable extent that many manufacturing outfits were forced out of production line.

However, looking at the manufacturing sector over the years and under such macroeconomic managements it becomes obvious that the share of the sector in terms of GDP has been relatively low. In 1970 the share of Manufacturing in the GDP was about 9%, 10% in 1980 it falls from 8 to 6 % in 1990s and in 2008 the share was about 5.9% (CBN Annual Report, 2009). Although the manufacturing share of GDP in the 90s was about 7% it recorded a negative growth of 8% and during this same period the overall manufacturing capacity utilization fell from over 70% in the 70s to 39% in 1980s and to about 27% in 1998. In fact the productivity level of the sector has witnessed a phenomenal increase in the 1970s and early 1980s; it however fell in the 1990s but improved in 2000s.

In view of these developments, low productivity growth has been a major constraining feature of the manufacturing sector in Nigeria. The sector has remained highly underdeveloped with low share of GDP despite all the measures put in place.

This has made it expedient for the state to be the prime mover of industrial policies and provides macroeconomic frameworks that will ensure the sustain growth of the sector among which are monetary and exchange rate policies especially with the adoption of the Structural Adjustment of 1986. Hence the relevance of this study which examines the effect of monetary and exchange rate stability on the manufacturing sector output from 1986 to 2013.

1.2 STATEMENT OF PROBLEM

Exploration into the literature has shown that higher manufacturing sector output is a sure means of boosting economic growth and raising the standard of living. This has been the reason why many economies have formulated and implemented effective productivity schemes that helped them to pull out of global recession and set them on the path of growth. In Nigeria the manufacturing sector is also favoured based on the general notion that it is a major source of rapid economic growth. Structural transformation and self-sufficiency also lies on its growth. Resources have been channelled into the sector through heavy public sector investment (Anyanwu, 1993). This coupled with increasing inflow of foreign direct investment into the sector which had brought with it current method of production that can help minimize time and cost and the production of more standard products result to a positive developments in the manufacturing sector.

Despite this flourishing initial growth of the manufacturing sector, the output of the sector cannot meet the huge domestic demand and as a result it leads to poor performance and productivity. The sectors' share in terms of GDP has also been relatively low. In 1970 the share of Manufacturing in the GDP was about 9%, 10% in 1980 and falls from 8 to 6 % in 1990 and in 2008 the share was about 5.9% (CBN Annual Report, 2009). Although the manufacturing share of GDP in the 90s was about 7% it recorded a negative growth of 8% and during this same period the overall manufacturing capacity utilization fell from over 70% in the 70s to 39% in 1980s and to about 27% in 1998. In fact the performance of the manufacturing sector has witnessed a phenomenal increase in the 1970s and early 1980; but the sector's performance fell in the 1990s but improved in 2000s.

Many problems have resulted to this scenario both external and internal. Some of the external problems include the phenomenal increase in capital outflow, oil price

shocks, exchange rate volatility and the contagion effect. On the other hand, the factor that are considered internal may include; the lack of necessary infrastructural facilities, poor and epileptic power supply, high rate of corruption among others. The result of which is low productivity and under capacity utilization that characterized the manufacturing sector.

Macroeconomic risks in terms of exchange rate fluctuations, inflation, high interest rate and liquidity risks are also identified by others as the major problems facing the manufacturing sector. For instance the growth of broad money supply (M2) had fluctuated from 1986 to 1999 at an average of more than 25% and it continued to about 30.8% in 2003 (CBN, 2012). It also further rose to 46.1% between 2004 and 2010. The exchange rate on the other hand has also never been stable since 1987 when 1 USD exchange for 4.016 Naira up to 2011 when 1 USD is exchanged for 153.8 naira (CBN, 2012). Today 1$ is exchanged for 165 naira. Thus monetary and exchange rate fluctuations have characterized the Nigerian economy and this may have significant impact on the performance of the productive sectors of the economy. But the role of these monetary variables in determining the manufacturing sector output has not been fully addressed in the literature.

It was also discovered that earlier studies in the area focuses on the examination of factors such as power supply, increased pump price of diesel, inadequate demand, insufficient raw materials, inadequate capital and frequent machine breakdowns. The studies have failed to include other variables such as exchange rate, money supply, lending rate as part of the factors that affect output of the sector. In this study an attempt is made to examine the effect of money supply and exchange rate stability along other monetary variables on the manufacturing sector output. We also intend to extend the time frame and use more frequent data as most of the studies used annual data for their analysis which set limit to their findings.

1.3 RESEARCH QUESTIONS

In this research work we will attempt to address the following questions:

1. What is the extent to which changes in broad money supply affects performance of the manufacturing sector in Nigeria?

2. To what extent does exchange rate stability determine the output of the manufacturing sector in Nigeria?
3. Is there any long run relationship among manufacturing sector output, exchange rate and money supply in Nigeria?
4. Is there any causal relationship between manufacturing performance, exchange rate and money supply?
5. Do the changes in the Nigerian economy during the 2000s have any significant effect on the manufacturing performance?

1.4 OBJECTIVES OF THE STUDY

The main objective of the study is to empirically examine the impact of monetary and exchange rate stability on the manufacturing sector performance in Nigeria for the period 1986Q1 to 2013Q4. The specific objectives include:

1. To determine the extent to which manufacturing sector output responds to changes in money supply in Nigeria.
2. To determine the extent to which manufacturing sector output responds to exchange rate stability in Nigeria.
3. To examine the long run dynamic relationship between the output of the manufacturing sector, money supply and exchange rate in Nigeria.
4. To determine the nature of causality between manufacturing output, exchange rate and money supply.
5. To examine whether the changes in the Nigerian economy after 2000 are significant in explaining output in manufacturing sector or not.

1.5 RESEARCH HYPOTHESES

Given the objectives of the study, the following hypotheses are generated and tested.

1. Manufacturing sector output does not significantly respond to changes in money supply in Nigeria.
2. There is no relationship between manufacturing sector output and stability in foreign exchange in Nigeria.
3. There is no relationship in the long run between money supply, exchange rate and the manufacturing sector output in Nigeria.

4. There is no causality between money supply, exchange rate and manufacturing output in Nigeria.
5. There is no any significant change in the manufacturing performance between the two periods.

1.6 SIGNIFICANCE OF THE STUDY

Achieving steady economic growth has been the major aspiration of most nations as it is considered a prelude to achieving economic development. The role of manufacturing sector in accelerating the pace of economic and social growth is well recognized in growth literature. It is a known fact that productivity is crucial in the economic and social development of any nation. When productivity is high, manufacturing firm earn high incomes and profits, therefore, firm are in a better position to pay high wages which subsequently leads to high standard of living. Nevertheless, low productivity gives rise to high prices that will result in low living standard. In the 70's Nigeria witnessed substantial growth in the production and trade in the manufacturing sector, which was attributable largely to the massive investment by government in the industrial sector and the import substitution policy, which encouraged domestic manufacturing, though heavily dependent on imported inputs. However, from 1980 till date, the manufacturing output fluctuated, hence to achieve high living standard for the citizenry through increased productivity of the sector, successive government have tried to boost manufacturing productivity. Unfortunately, the sector is not growing as it is expected going by the measures put in place by the government to achieve the result from the increase in productivity of the manufacturing sector. Hence the significance of the study which analyse the impact of various macroeconomic variables on the manufacturing sector output in Nigeria.

Moreover, most of the research conducted in this field, focused on Developed countries and Asian countries and those conducted in Nigeria used multiple regressions and include macroeconomic variables that relates to the manufacturing sector output without including money supply in their regression. As such this research intend to utilize VAR estimation techniques as it has not been used to the researcher's knowledge in any of the related study in Nigeria with inclusion of money supply in the analysis. By incorporating these additional macroeconomic variables,

the research will assist in bridging the gap that exists in the literature due to the relevance of these variables in economic theory.

The study will add the existing literature and also serve as a resourceful material to the students, researchers and interested individuals alike. The work will also in conjunction with other studies lay the foundation upon which further studies will be built.

1.7 SCOPE AND LIMITATION OF THE STUDY

The research examines the impact of monetary and exchange rate stability on the output of the manufacturing sector for the period $1986Q_1$-$2012Q_4$. The choice of period is informed by the fact that, it was in 1986 that the Nigerian economy experienced a great shift in policy dimensions with the adoption of Structural Adjustment Programs. Monetary policy changes from direct to indirect policy regulations, the exchange rate policy was changed from fixed to floating rate and the manufacturing sector was more or less deregulated.

1.8 ORGANIZATION OF STUDY

The study is organized in such a way to cover five chapters. Chapter one is the introductory chapter which contains the background to the study, the statement of the research problem, research questions, objectives of the study, research hypotheses, significance of the study as well as the scope and limitations of the study. Chapter two presents literature review as well as the theoretical underpinnings of the study. Chapter three dwells on research methodology, while Chapter four presents the result of the study and discusses its findings and the policy implications of the findings. Chapter five give summary of the findings, draw conclusions and proffer recommendations.

CHAPTER TWO
RELATED LITERATURE REVIEW

2.1 REVIEW OF EMPIRICAL LITERATURE

2.1.1 The Link between Manufacturing Output, Money Supply and Exchange Rate

The link between exchange rate, money supply and output in developing countries has been discussed in many empirical studies. The findings from these studies differ and their conclusion cannot be generalised. On the issue of output growth of different sectors of the economy, it seems like there are little works in the area. It appears in the literature that studies about the impact of growth of money supply and exchange rate on the manufacturing sector performance have also came out with different results depending on the time under study, the country and the macroeconomic and institutional arrangements of different countries. The effect of these variables on the manufacturing sector performance is therefore time and country specific Akinlo (2007). As we can see from the studies below

On the issue of exchange rate as it relates to the output, most of the empirical studies have came out with a similar conclusion that, there is correlation between exchange rate and manufacturing output. For example Gosh et al, 1995 indicated in a study that exchange rate granger cause manufacturing output on average and that is true mostly in countries with flexible exchange rates.

A similar result was obtained by Aghevli, were he concludes that most countries with pegged exchange rate regimes have experienced high correlation between exchange rate and manufacturing output. On the other hand, the study indicates that economies with flexible exchange rate policies used to experienced low correlation with output in the manufacturing sector when they adopting a more prudent fiscal policies. Similarly, Siklos (1996) concluded that countries with fixed exchange rate regimes often experienced higher decline in output because the regimes were not credible (Aghevli et al, 1991).

However, views on the link between fluctuations in exchange rate and the rate of output growth are generally controversial. Although conventional economic theory indicates that, devaluation can generally leads to output expansion in the manufacturing sector because of the fact that, it may enhances production in export and import-competing sectors of the economy (Morley,1992). Devaluation by stimulating growth in the tradable sectors of the economy, lower rate of exchange

may also put the manufacturing sector on the path of growth and output expansion. On a more general note, flexible exchange rate policy may enhance adjustment and facilitates the growth of output after some downward fluctuations in the level of output. It is also pointed out by Krugman and Taylor (1978), that currency devaluations may leads to an instant fall in the prices of exported goods and a corresponding rise in the prices of imported goods relative to their domestic counter parts. Therefore, profits may improve in the trade related activities as a consequence.

With respect to manufacturing sector, a study by Gosh et al. (1995), unlike the above founds no evidence of significant output growth variability particularly across countries with different exchange rate regimes. Devaluations might also cause decline in output of the manufacturing sector in particular and the economy in general through the channel of the external debt denominated in foreign currencies. It is obvious that devaluation may increase the amount of the resources used for servicing the external debt and thus crowd out domestic investment. A study by Kamin and Rogers (1997) on the impact of changes in exchange rate on output in Mexico shows that depreciation may result to a decline in economic activities.

Kasim (1998) obtained similar and indicates that if the rates of government spending, terms of trade and money growth are held constant, devaluations leads to a reduction in output. In the same with the above, Ghura and Hadjimichael (1996) shows that growth of output in the manufacturing sector was negatively correlated with real effective exchange rate changes.

Other empirical evidences on the effects of exchange rate fluctuations on output and economic activities appeared to be inconclusive. It is also clear that, when the real effective exchange rates of a country converged towards equilibrium levels, the country experienced higher growth rates more rapidly.

On the other hand, the causal relationship that existed between the supply of money and output was demonstrated by early researches such as that of (Sims, C. A., 1972) (William et al, 1976) and (Barro R. J., 1978). More recent researches have utilized the use of variables that seems more economical in terms of their relationship with output. For example studies have used variables such as the rate of interest, exchange rate and price index in order to explain the dynamic relationship and causality between money supply and output in the manufacturing sector.

Friedman and Kuttner (2012) in a study on the relationship between money supply, real income and manufacturing output, where they used United States data from 1990 to 2010 through the method of auto-regression test and variance decompositions, found a significant relationships between money and real income, prices and output separately. Their result shows that there is a cointegration between money and the manufacturing output which come through interest rate. They further concluded that money supply on average cannot be a predictive variable over output, particularly in the manufacturing sector.

Tan and Baharumshah (1999) found that both money supply measures (M1 and M3) using VECM have significant effect on output and prices. Though their findings is in contrast with that of Azali and Matthews (1996) who presents evidences of causality between money (M2) and output only in the post-liberalization era. Thus, their paper is an attempt to estimate the power of M2 in explaining the future value of the output.

The result of the monetarist was also challenged by Bokunjoko (1997) that unanticipated money affects output. In his study, Sims shows that whenever you include nominal interest rate in the analysis, money loses its purchasing power, which implies ineffectiveness of money. He therefore tries to investigate whether interest rate will be all that effective, using different channels as his own policy targets.

Ooi and Brahmana (2011), examines the effect of monetary variable on the output of manufacturing sector and general inflation in Malaysia. The result of their study provides evidence on the important role of money in terms of variability in price and output. They also found interest rate to be important factor in output variability. The paper concludes that the there is no evidence of causality from money to manufacturing output which suggest that money is not significant in achieving output expansion in the manufacturing sector absorbed by growth in aggregate supply.

Methodological issues are also worth discussing after considering theoretical issues. Because some of the studies on this relationship such as Tan and Cheng (1995) did not examine time series properties of the data of the variables used in their studies, such as the test for stationarity (unit root), cointegration test and test for causality the result of which may be misspecification in the model and invalid conclusions (Masih, 1996).

Friedman and Kuttner (1993) in their paper have employed the standard Granger-causality tests to test for the existence of causality among variables included in the model. It is clear in the literature that both the standard Granger-causality and the cointegration test are all popular tests for testing empirical relationship between monetary policy, money supply and aggregate output (Baharumshah and Tan, 1999).

Although cointegration test indicates the presence or absence of long run relationship (causality) it does not indicates the direction of causality among the variables included in a model. To know the direction of causality, the model needs to be tested for causality through the Granger causality test or any other test of causality defending on the choice of the researcher in order to understand whether all the exogenous variables and their lag value may affect endogenous variable in the model.

In a nutshell, it is our hope in this study to employ Granger Causality test in order to ascertain the direction of causality between monetary variables (interest rate, exchange rate, credit to private sector and the prime lending rate) and output (manufacturing output). However, the approach provided a simple procedure that requires estimating VECM model in the straight forward approach to see whether the error correction term will be significant in explaining the long run adjustments to equilibrium relationship among the variables.

However, the above review from empirical studies has shown that there exist a clear link between money supply, exchange rate and the level of output in the manufacturing sector although the nature of the relation was not certain as some studies provide evidence of negative relation others present a positive one, some present money to be neutral. We attempt in this study to examine the nature of this relationship empirically using data from Nigeria.

2.1.2 Monetary and Exchange Rate Stability and the Manufacturing Sector Performance Nexus

The impact of exchange rate regimes and exchange rate movements on inflation and growth of output in most developing countries has been discussed in many empirical studies. The findings from these studies differ and their conclusion cannot be generalised. On the part of the issue of inflation, it seems like there is nearly a general consensus in the literature about the impact the growth of money supply either as the

main driving force behind inflation or the main reason for rising prices in many economies.

On the issue of exchange rate as it relates to the rate of inflation, most of the empirical studies on the issue have came out with a similar conclusion that, there is correlation between exchange rate and an increase in the consumer prices even on a temporary basis. For example Gosh et al, 1995 indicated in a study that inflation rate on average was lower in economies with pegged exchange rate regimes compared to countries with a flexible exchange rates. (Gosh et al, 1995)

A similar result was obtained by Aghevli, where he concludes that most countries with pegged exchange rate regimes have experienced high rates of inflation due to their inappropriate fiscal policies. On the other hand, the study indicates that economies with flexible exchange rate policies used to experienced low rates of inflation when they adopting a more prudent fiscal policies. Similarly, Siklos (1996) concluded that countries with fixed exchange rate regimes often experienced higher, rather than lower, average inflation rates because the regimes were not credible (Aghevli et al, 1991).

Views on the link between fluctuations in exchange rate and the rate of economic growth are generally controversial. Although conventional economic theory indicates that, devaluation can generally leads to output expansion because of the fact that, it may enhances production in export and import-competing sectors of the economy (Dornbusch, 1980).

Moreover, devaluation by stimulating growth in the tradable sectors of the economy, lower rate of exchange may also put the economy on the path of economic growth and development. On a more general note, flexible exchange rate policy may enhance adjustment and facilitates the growth of output after some downward fluctuations in the level of output. With respect to inflation, a study by Gosh et al. (1995), unlike the above founds no evidence of significant output growth variability particularly across countries with different exchange rate regimes.

It is also pointed out by Krugman and Taylor (1978), that currency devaluations may leads to an instant fall in the prices of exported goods and a corresponding rise in the prices of imported goods relative to their domestic counter parts. Therefore, profits

may improve in the trade related activities as a consequence. Devaluations might cause contractionary effect through the channel of the external debt denominated in foreign currencies. It is obvious that devaluation may increase the amount of the resources used for servicing the external debt and thus crowd out domestic investment. A study by Kamin and Rogers (1997) on the impact of changes in exchange rate on output in Mexico shows that depreciation may result to a decline in economic activities.

Edwards (1989) obtained similar and indicates that if the rates of government spending, terms of trade and money growth are held constant, devaluations leads to a reduction in output. In contrast to the above, Ghura and Hadjimichael (1996) shows that growth of output was negatively correlated with real effective exchange rate changes.

Other empirical evidences on the effects of exchange rate fluctuations on output and economic activities appeared to be inconclusive. It is also clear that, when the real effective exchange rates of a country converged towards equilibrium levels, the country experienced higher growth rates more rapidly.

The causal relationship that existed between the supply of money and income or output was demonstrated by early researches such as that of (Sims, C. A., 1972) (William et al, 1976) and (Barro R. J., 1978). More recent researches have utilized the use of variables that seems more economical in terms of their relationship with output. For example studies have used variables such as the rate of interest, exchange rate and price index in order to explain the dynamic relationship and causality between money supply and economic growth.

Friedman and Kuttner (1992) in a study on the relationship between money supply, real income and prices where they used United States data from 1960 to 1990 through the method of auto-regression test and variance decompositions, found a significant relationships between money and real income or prices separately. Their result shows that there is a cointegration between money and real income which come through interest rate. They further concluded that money supply on average cannot be a predictive variable over income statistically.

Tan and Baharumshah (1999) found that both money supply measures (M1 and M3) using VECM have significant effect on output and prices. Though their findings is in contrast with that of Azali and Matthews (1996) who presents evidences of causality between money (M2) and output only in the post-liberalization era. Thus, their paper is an attempt to estimate the power of M2 in explaining the future value of the output.

The result of the monetarist was also challenged by Sims (1980, 1992) that unanticipated money affects output (e.g. Barro, 1978). In his study, Sims shows that whenever you include nominal interest rate in the analysis, money loses its purchasing power, which implies ineffectiveness of money. He therefore tries to investigate whether interest rate will be all that effective, using different channels as his own policy targets.

Methodological issues are also worth discussing after considering theoretical issues. Because some of the studies on this relationship such as Tan and Cheng (1995) did not examine time series properties of the data of the variables used in their studies, such as the test for stationarity (unit root), cointegration test and test for causality the result of which may be misspecification in the model and invalid conclusions (Masih, 1996).

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Although cointegration test indicates the presence or absence of long run relationship (causality) it does not indicates the direction of causality among the variables included in a model. To know the direction of causality, the model needs to be tested for causality through the Granger causality test or any other test of causality defending on the choice of the researcher in order to understand whether all the exogenous variables and their lag value may affect endogenous variable in the model.

In a nutshell, it is our hope in this study to employ Granger Causality test in order to ascertain the direction of causality between monetary variables (interest rate, exchange rate, credit to private sector and the prime lending rate) and output

(manufacturing output). However, the approach provided a simple procedure that requires estimating VECM model in the straight forward approach to see whether the error correction term will be significant in explaining the long run adjustments to equilibrium relationship among the variables.

Klau (2008) in a study compared the economic performance of two groups of countries adopting different exchange rate policies. These are; CFA countries adopting fixed exchange rate regime and the Sub-Saharan Africa adopting flexible exchange rate regimes. The result of vector error correction indicates that both country group currency devaluations have a positive impact on economic activities. However, his conclusion is in contradictions with previous studies which indicate possible contractionary effects of devaluations on economic activities.

Ooi and Brahmana (2011), examines the effect of monetary variable on output and inflation in Malaysia. The result of their study provides evidence on the important role of money in terms of variability in price and output. They also found interest rate to be important factor in output variability. The paper concludes that the there is no evidence of causality from real GDP to price suggests and that the excess of aggregate demand as a result of increase in real GDP is just absorbed by growth in aggregate supply.

However, the above review from empirical studies has shown that there exist a clear link between money supply, exchange rate and the level of output although the nature of the relation was not certain as some studies provide evidence of negative relation others present a positive one. We will also attempt in this study to examine the nature of this relationship empirically using data from Nigeria.

2.1.3 Performance of the Manufacturing Sector

H Ku et al (2010), in their paper, examines the both the previous and current Nigerian manufacturing sector's performance. They tried to find out some of the challenges that limit the productivity of the sector. The researchers has identified that the sector has in the 1960s and 1970s shown positive growth due to the inflow of foreign direct investment. These foreign firms had brought the up to date industrial technology that reduce cost and minimize time that improved to a significant level the quality of the

goods manufactured. However, with these developments the sector has shown a significant growth in its output, but still the sector cannot sufficiently meets the Nigerian's demand for manufactured products and the country has to pay much to import manufactured goods.

The paper moreover, identified many problems since 1980 to date that resulted to the marginal contribution of the sector to gross domestic product. Some of the major problems as identified by the paper were dependency on the oil sector, poor infrastructure, inadequate skilled human labour, inadequate capital, lack of proper planning and management, and etc. The paper in conclusion stated that in order to revitalise the growth of the sector, it will be pertinent to put effort towards converting all these loop holes if the sector should play significant role in the development process of the country.

Adenikinju and Chete (2002) in their study, where they empirically analyzed the Nigerian manufacturing sector in terms of productivity over a 30-year period showed that the performance of the manufacturing sector was satisfactory for the period 1970 to 1980. But, from 1980 onward there is a clear downward trend in terms of GDP growth and the level of profitability. The oil price collapse of 1983in the international oil market has also negatively affected the performance of the manufacturing sector. This particular problem has resulted to decline in government revenues that reduced foreign exchange earnings. The government in turn came up with various initiatives that aimed at strict control of its trade such as various imports duties, imports licences and other restrictions that control the quantity of importation of some identified items. This has badly affected the performance of the manufacturing sector as it resulted to many problems especially with getting the needed inputs and other machines which resulted to massive industrial shut downs and under capacity utilization that greatly decline the output of the sector.

Adejugbe (1994) studied what effect trade policy have on the performance of Nigerian manufacturing after 1985. The paper observed that in an attempt to make the Nigerian trade regime liberal, promote manufacturing performance and import export activities the government has taken some policy actions. For example the government implement a flexible exchange rate policy and liberalized trade policy. As a result some major improvements in terms of reducing tariffs and increasing the rate of

trades. At this same period, import duties on imported commodities was also increased, especially those considered to be substitute of domestic products. The government also made other steps in reducing import duties on major inputs and machineries used by the manufacturing sector. These policy options were adopted by the government with the aim of protecting the domestic manufacturers through the policy protectionism to enable them become highly productive in terms of output and efficient in their production process.

Alli (2008) in a paper, examined the present performance of the Nigerian manufacturing sector thereby reviewing a surveyed results of the study conducted by the Manufacturers Association of Nigeria (MAN) in 2007. The review indicated that manufacturing firms faced their difficult time during the period under study. It was also disclosed that manufacturing activities have encountered financial difficulties and other crises which has resulted to a reduction in the number of firms operating at a break-even level and the large percentage as much as 60% are running to a shut down position. Some of the reasons as illustrated by MAN resulted to the above phenomenon are; "high production costs, high interest and exchange rates, influx of foreign imported commodities, numerous type of taxes, insufficient effective demand as a result of low disposable income, other problems includes too much bureaucracy and rigorous inspection processes at the Nigerian ports that resulted to delay in clearing raw materials and other spare parts" (MAN, 2008).

Meagher (2006) considered the importance of academic research in terms of support and development to the manufacturing sector. He argued that Nigerian universities and other tertiary or research institutions are not adequately supporting the sector with an up to date research on how to come with new products and marketing strategy. He then commended that Nigerian government and other stakeholders should make sure that comprehensive researches are funded in order to bring new ideas in the development of the sector. It is through these that the decaying manufacturing sector will be revived and guided on to the path of growth and development. The researcher concluded that on the part of the manufacturing firms, there is the need to establish and/or improve the standard of their research and development departments in order to discover new technologies and new raw materials locally and come up with procedure to effectively use them.

Another study by Havrylyshyn (1990) looked at factors that served as obstacles to significant performance of the manufacturing sector with evidence from Nigeria. He however argued that, although the government in its quest for sustainable development is in dear need and ready to bring development to the sector in order to provide good linkage with all the sectors of the economy and diversifies its revenue sources there is a number of problems. The paper also shows that the business environment in Nigeria is not conducive for efficient manufacturing activities. This poor business environment was as a resulted of the past government policies that are highly destructive to trade and manufacturing activities which has significantly damaged the Nigerian investment framework.

In this same vein, Adenikinju (2002) has accused the government for the present poor output of the Nigerian manufacturing firms. According to him the increased public involvement in such issues as related to the manufacturing industry has reduced to a significant level the contribution of the private sector in improving the performance of the economy. Therefore, the contribution of the private manufacturers to the growth of the gross domestic product was so minimal.

Nishimizu and Robinson (1994) in their study observed that the inability of the Nigerian manufacturing sector to brought significant contribution to the development process of the economy has stressed the need for an urgent action to revitalize the sector. There is for example the need for the government to implement private sector friendly policies in order to raise the level of capacity utilization in the sector. The researchers also bring to book the need of reforms in the related sectors such as the power sector in order to allow for an effective power supply. Therefore power supply needs to be reliable. In the development of the sector the infrastructure is highly significant as there is a strong need for good infrastructural facilities that will complement production in the sector. Although Nigerian government at all times has as part of their goals, to improve infrastructure and other social and economic services. Until these reforms are carefully and comprehensively implemented that the expected progress will be expected for the Nigerian economy in general and the manufacturing sector in particular. And these will also require time and patients for the needed adjustment and stabilization to take place.

Adenikinju and Chete (2003) also concluded in their studies that part of the reasons that bedevilled significant productivity of the manufacturing firms particularly after the 1980s were lack and inadequacy of the much needed inputs and spare parts for machineries.

Anyanwu (2000), came up with similar findings as that of Adenikinju and Chete, he indicated that the early 1980s downfall of the world oil market that resulted to a long economic recession has resulted to a drastic decline in the foreign exchange earnings of Nigeria which worsened the exchange rate of the naira. Other problems pointed out in the paper were the structural adjustment program of the 1980s and the continuous decline and worsening of the Nigeria's exchange rate (Mazaheri, 2003).

Ukaegbu (1998) observes that lack of adequate data has made complex to conduct a general review of the Nigerian manufacturing sector because there are no enough data particlarly on the level productivity of the Nigerian economy. Reliable and sufficient data on the productivity of the Nigerian manufacturing sector are very little. However, certain important information on the output level of the manufacturing sector of the country was reported by various research works at different levels (Ukaegbu, 1998) .

Ayanwale (2007) in a paper studied how the level of foreign direct investment inflows affect the output level of the Nigerian productive sectors in general and manufacturing sector in particular, his result revealed that Nigeria is always striving to attract more foreign direct investment inflows as it has positive effect on the economy as a whole and the manufacturing sector in particular through technology transfer, managerial skills and employment generations to the teeming population. The government also supported and influenced the establishment and activities of the manufacturing sector by the proceeds realised from the operations of these foreign firms.

Ayanwale (2007) also founds that the statistics available on the Nigeria's manufacturing and other macroeconomic data has sown a poor contributions of the manufacturing sector output to GDP and the level of national employment. For example the contributions of the sector to gross domestic product (GDP) was below 10% for the period 199 to 2005, the target that the sector's contribution will reach15% by 2010, seems almost impossible from the data trend. Another vital point highlighted by the Ayanwale's work is that while foreign direct investments is considered to be beneficial to the Nigerian economy and that it will boost manufacturing activities, in

manufacturing could be beneficial to the economy, human resource issues should be given good emphasis in order to effectively utilized the positive effects of FDI in the economy (Ayanwale, 2007).

United Nations Industrial Development Organization (UNIDO) survey reports of 2004 as disclosed by Malik et al (2004) has shown that manufacturing sector in Nigeria is bedevilled by high unskilled and unqualified labour for quite a long period of time. The people that constitutes the sectors work force are mostly unqualified or with low skills. The findings of the study were very important as it is believed that the skill and efficiency of the labour force has a direct effect on the quality of the output of the manufacturing sector. The inability of the manufacturers to pay the salary of the qualified labour was also part of the reason for the employment of most of the unskilled and unqualified workers as their pay is greatly cheaper as compared to those of the qualified ones (Alli, 2008).

In the same vein, Mazumdar and Mazaheri (2003) in a study observed wage structure of the manufacturing firms. He argued that, many of the manufacturing firms in Africa paid their workers very low wages on average because majority of the manufacturers employ unskilled labour. The reason of which is because highly skilled labourers attract higher wages that most of the firms are unable to pay, as such, they prefer employing the unskilled labour that attracts little amount of pay on the average. That is why even though employment opportunities in the manufacturing sector are in abundance, poverty levels are still visible and not alleviated; the quality and standard of the labour force are also not improving. It is also suggested by the researchers that the importance of investing in skilled labour must be realized by manufacturing companies in order to run manufacturing process on an updated methods. This will further help in reducing the overall poverty level if the manufacturers are encouraged to pay significant wages particularly to the skilled labour.

It is identified in the recent researches that, high lending rate, fluctuations in exchange rate, unpredicted government policies, high public involvement, poor infrastructural facilities and un implementation of policies by the government are the major obstacles that limits the output performance and are continuously limiting the sector's productivity as indicated by the Bureau of Public Enterprises.

In summary, the above reviewed literature on the output performance and productivity of the manufacturing sector in Nigerian has obviously shown that the performance of the sector is very negligible if we are to consider its contributions to GDP and employment generation. The review further shows the effect of mismanagement and negligence on the side of the government of the happenings in the manufacturing sector is resulting to low output of the Nigerian economy. The government has placed more importance on the oil sector as its main source of revenue, export and foreign exchange earnings as such the government has given less importance to other sectors of the economy, hence poor performance of most of the sectors of the economy including the manufacturing sector. We also understand from the reviewed literature that, macroeconomic policies of the government with regards to interest rate, exchange rate, credit policies has also posed greater challenge to the growth of the manufacturing sector. Our study therefore is aimed to access the nature of causality that exist between selected macroeconomic variables and the performance of the sector in order proffer suggestion that if adopted will bring an upward trend in the sector's output and performance.

2.1.4 Problems Militating against Manufacturing Performance

The above literature review on the performance of the manufacturing sector has however, presented a detailed account of information related to the historical and current performance of the Nigerian manufacturing sector, the link between exchange rate, money supply and output in general and the manufacturing sector output in particular. Now let us consider in summary form the major problems that constrain manufacturing output.

It is revealed in the literature that fluctuations in the global oil price, has resulted to great economic instability of the country which shows Nigerian economy depends heavily on the oil sector. Although various government of Nigeria are always ambitious to diversify the economy in order to reduce the over reliance on the oil sector and increase the relevance of other sectors of the economy as the contribution of these other sectors to the overall GDP was so insignificant. For example, the contribution of the manufacturing sector was just 5% which is very low (H Ku et al, 2010). It is generally agreed by researchers and all stakeholders that, the contribution and the relevance of the manufacturing sector which was and used to be the engine of

growth to many economies around the world and a major employer of labour needs to be improved. Government should therefore come up with good macroeconomic policies that will enhance the favourability of the business environment in Nigeria.

It was also highlighted in the literature that, the government in the quest of industrializing the country is very important and significant, and the government will also benefits from doing so because improving the sectors' performance will help in fighting the ever increasing level of unemployment and reduce the volatility of the Nigerian economy to the vagaries of external shocks.

Moreover, some gaps were identified from the literature. Some of which include the fact that, most of the concluded studies in the literature have only considered the productivity of the Nigerian manufacturing sector as it relates to those factors as trade liberalization policies technological issues and power supply. For example, in the literature there is very little studies that linked the performance of the manufacturing sector with other macroeconomic variables such as the lending rate, naira exchange rate, and the credit worthiness of the manufacturers in Nigeria. Furthermore, most of the studies in the area have suggested for few strategies and forget the powerful impact of macroeconomic variable in improving productivity of the sector.

Inadequate comprehensive researches on the subject and other productivity issues through which the problems identified will be converted are also part of the problems, as such some studies suggest the idea of increasing the level of research and development as part of the strategies to improve the performance of the economy in general and that of the various sectors, as they argued that the gap identified in the literature should be balanced by future researches on the area. Hence the relevance of this study which study the effect of these macroeconomic variables on the performance of the manufacturing sector as an attempt to provide suggestions on how to arrest the declining trend in the sector.

2.2 CONCEPTUAL FRAMEWORK

Explaining the long run behaviour of exchange rate fluctuations and money supply as they affect output level is traditionally carried out in economic theory based on the Quantity Theory of Money (QTM) and the Purchasing Power Parity (PPP) Theory as the foundation theories for sophisticated analysis on the dynamic relationship.

The equation of exchange, introduced by Irving Fisher identifies the exact mathematical relationship on how money supply affects the real sector of the economy MV=PT. The equation can be used with some modifications to see how changes in money supply can impact on the activities of the manufacturing sector of an economy.

Where M is the money supply that includes currency in circulation plus checkable deposits, V is the income velocity of money which has been defined as being equal to the monetary value of income and is output divided by the money stock, P is the general price level and T is the overall level of transactions in the economy.

However, contemporary economists make use of a simplified equation of exchange that takes the following form: MV=PY

Where Y measures the aggregate output level of the economy under the simplifying assumption that the volume of economic transactions in the economy over a given time period would be proportional to the aggregate output. For our own case we use it as the manufacturing output.

While on the other hand, for us include the effect of exchange rate in the model, we use the famous Purchasing Power Parity hypothesis. The implication of the theory was that exchange rates should change in response to the price differentials that exist between countries.

The two theories above can be represented by using the following equations. We begin the analysis by the Fisher's identity of the QTM for two countries

$$p = m + v - y \quad (1)$$

$$p^* = m^* + v^* - y^* \quad (2)$$

Where p is the rate of change in the level of domestic price, m represents the rate of change in the supply of money, v stands for the change in velocity while y is the growth rate of output in the economy. The variables with (*) relate to the country abroad.

We now introduce PPP in the following way:

$$e = p - p^* + k \quad (3)$$

e represent the rate of depreciation of the domestic currency which resulted to a proportional change in both the rate of depreciation and the rate of change in domestic prices. We now substitute (1) and (2) into (3) it thus give us:

$$e = (m - m^*) + (v - v^*) - (y - y^*) + k \qquad (4)$$

In equation (4) we combine both the QTM and PPP in a single equation, the outcome of which shows that there is a proportional relation between the changes in money, exchange rate and the level of output. We therefore intends in this work to test the validity of these proportionality propositions.

The research modifies this model by replacing the output level by the manufacturing sector output. Similarly, in the quantity theory of money a proportional and direct relationship is assumed between output and money supply. Again, it is taken implicitly that output will be affected by exchange rate via money supply-exchange rate relation in the purchasing power parity.

CHAPTER THREE

METHODOLOGY

3.1 RESEARCH DESIGN

For explaining the macroeconomic relationships, time series data are usually employed in the literature. This study also follows this common practice of using time series data. As was noted the aim of the analysis is to build an econometrics model that would link such macroeconomic variables as the manufacturing output, money supply and exchange rate. Therefore, time series data on these aggregates are used. The research uses a five variable VEC model, which include the following variables; the nominal level of broad money supply (MSS), exchange rate (EXR), Manufacturing sector output (MSQ), Lending Rate and Credit to the Private Sector (CPS) from $1986Q_1$ to $2013Q_4$

3.2 SOURCES OF DATA

To achieve the stated objectives of the study, the work employed the use of quarterly time series data of the variables. The data used in the study were sourced from the Central Bank of Nigeria's *Statistical Bulletin*, the International Monetary Fund's *International Financial Statistics database (available online)*.

3.3 MODELLING STRATEGY

For the purpose of achieving the objectives of this research work, we employ the following modelling strategy to test the relationships (causality, long run elasticities and short run elasticities) between manufacturing sector performance, money supply, exchange rate, lending rate and credit to private sector in Nigeria. First, we test for stationarity of the time series data and in case of non stationarity, we take first difference of the data in order to achieve stationarity. Second, we test for the long term elasticities between the different variables, choosing as the dependent variable the manufacturing sector output. Finally, we test formally for the cointegration of the time series and set up the appropriate Error Correction Model. These procedures however, raise several methodological issues that are treated individually in the following headings.

3.3.1 Unit Root Test

Non-stationarity of time series data used by economists perhaps present the most fundamental and most common complicating issue econometricians are confronted with. Therefore, before estimation of our model, tests for stationarity i.e. unit root tests will be conducted on the variables to determine the stationarity or otherwise of

the variables by using Augmented Dickey-Fuller tests (ADF test) and Phillips and Peron (PP) test. The following equation present the possible form of the ADF test:

$$\Delta Y_t = \alpha_0 + \delta Y_{t-1} + \alpha_2 t + \sum Y_{t-k} + u_t \quad (1)$$

Where ΔY_t is the change in the dependent variable, α_0 is a constant term, α_2 is a coefficient of a time trend t, ΔY_{t-k} is the set of lagged explanatory variables, u_t is by assumption a white noise error term and k is the lag length. The test involves testing the following hypothesis:

H0: $\delta = 0$ (Y_t is not stationary or Y_t has a unit root)

H1: $\delta > 0$ (Y_t is stationary)

Phillips-Perron (1988) modified the ADF test procedure to incorporate a known structural change into the tests for unit root. The test was developed in order to take care of the wrong assumption made by ADF that "the error terms are statistically independent and have a constant variance" (Asteriou D and Hall S.G, 2007). Thus, when the precise data of the structural break is unknown and if the residual process is heterogeneous, or weakly dependent, the alternative Phillips-Perron test can be used. This is given below in the form of AR (1) process.

$$\Delta Y_{t-1} = \alpha_0 + \delta X_{t-1} + \alpha_2 t + e_t \quad (2)$$

Where

ΔY_{t-1} = is the change in the lagged dependent variable

α_0 = constant term

α_2 = coefficient of a time trend t

X_{t-1} = First lag of explanatory variable

e_t = white noise error term

Once we confirmed the stationarity of our variables, or non-stationary variables have been normalised by taking first difference, we go ahead to test for the existence of cointegration between non-stationary variables.

3.3.2 Test for Cointegration

Formally, two non-stationary series, x_t and y_t, are cointegrated if they can produce a linear combination such as $x_t - \beta y_t$ that will yield a new series z_t which is stationary. The cointegrating vector $[1 - \beta]$ yielding a stationary series may or may not exists. Therefore to know when to use the ECM, one needs to test for the presence of cointegration.

Engle and Granger (1987) establish that cointegration exist if the residual of the OLS equation, u_t contains a unit root. If for example 'a' and 'b' are the estimated parameters of the true parameters α and β in the regression equation such that;

$$y_t = \alpha + \beta x_t + u_t \qquad (3)$$

Where

$$u_t = y_t - a - bx_t \qquad (4)$$

the formal method adopted in this research work is that of the Johansen – Juselius multivariate cointegration model which is given below:

$$\Delta x_t = \sum \Gamma_i \Delta x_{t-k} + \Pi x_{t-j} + \varepsilon_t$$

Where;

x_t is the vector of manufacturing output, money supply, prime lending rate, credit to private sector and the exchange rate. Δ is the symbol of difference operator, ε_t is a vector of the residuals, while the expression Πx_{t-j} is the error correction term and we can always factor out Π into two separate matrices such as α and β such that $\Pi = \alpha \beta'$ where β' represent the vector of cointegrating parameters while α denotes the vector of the error correction coefficient which measures the speed of convergence to the long run equilibrium.

For our own purpose we, will employ the pre-programmed Johansen cointegration test provided by the Eviews. And once cointegration among the variables has been established, the Error Correction Model (Engle and Granger, 1987) which allows estimating the short run relationship between variables will be employed.

3.3.3 The Error Correction Model

The ECM corrects for shocks that drive the variables away from the long run trend, given the fact that for cointegrated non-stationary series, a suitable combination makes the series stationary. It therefore (ECM) exploits the fact that an appropriate linear combination of cointegrated variables yields a stationary series to correct for temporary (common) deviations from the long term relationships between the two variables. With ECM therefore, we can transformed cointegration from a source of error into an added tool for uncovering information. The error correction models of co-integration can therefore be specified as follows:

$$\Delta Y_t = \alpha_0 + \alpha_2 t + \sum \Delta Y_{t-k} + \sum \Delta X_{t-k} + \pi e_{t-1} + e_t \quad (5)$$

Where; Δ denotes the difference operator, e_t is serially independent random error with zero mean, and π is the error correction term (also known as the adjustment coefficient) derived from the long-run co-integration model. In fact π tells us how much of the equilibrium error is corrected each period and it is expected to be negative and statistically significant. If $\pi = 0$, then there is no adjustment and therefore there is no long run relationship, and hence we cannot adopt the ECM to estimate the model.

3.4 Model Specification

Having established the cointegration of our variables, we can therefore go further to specify the final form of the model and its equations, the choice between endogenous and exogenous variables can also be specified. Considering our objectives (examining the impacts of macroeconomic variables on the manufacturing sector performance), manufacturing sector output is our endogenous variable. We therefore specify the following equations:

Since our original model is of the form

$$MSO_t = \beta_0 + \beta_1 MSS_1 + \beta_2 CPS_t + \beta_3 PLR_t + \beta_4 EXR_t + \varepsilon_t \quad (6)$$

Then, the corresponding error correction model using four lags will be specified as:

$$\Delta MSO_t = \beta_0 + \beta_1 \Delta MSO_{t-k} + \beta_2 \Delta MSS_{t-k} + \beta_3 \Delta CPS_{t-k} + \beta_4 \Delta PLR_{t-k} + \beta_5 \Delta EXR_{t-k} + \beta_6 EC_{t-1} + \beta_7 *Dummy + \mu_t \quad (7)$$

K = 1, 2, 3, and 4

Where: β_1, β_2, β_3 β_4 and β_5 represent the short run elasticities of the variables. While β_6, is the coefficient of the error correction term which is the lagged value of the residuals derived from the cointegrating regression of the variables and it indicates the speed of adjustment of the system to the long-term equilibrium path in response to short-term deviations of the variables from their long term paths. β_7 is the coefficient of the Dummy variable which is set to be = 0 from (1988 to 2000) and = 1 from (2001 to 2012).

3.4.1 Variables and their Measurement

We used a quarterly data of the variables from 1988Q1 to 2012Q4 which was sourced mainly from the Central Bank of Nigeria statistical data and the National Bureau of Statistics website. We therefore included in the model based on availability of data the following variables:

1. ***Manufacturing Sector Output (MSQ):*** this is measured as the manufacturing sector GDP at 1999 constant price.
2. ***Money Supply (M2):*** this is measured by the nominal value of the broad money supply in millions of Naira.
3. ***Exchange Rate (EXR):*** this is measured by the market exchange rate of U.S Dollar to Nigerian Naira, expressed in naira.
4. ***Credit to Private Sector (CPS):*** this is measured by the total domestic credit to the private sector of the economy in millions of Naira.
5. ***The Prime Lending Rate (PLR):*** this will be measured by the Commercial Banks interest rate on time deposit maturing in 12 month.
6. ***Dummy Variable (D_1):*** a dummy variable is included in the model to capture for the significance or otherwise of a structural change in the Nigerian economy as there are some structural shifts from the year 2000 due to the need of diversifying the economy and putting it on the path of growth and development by the new democratic regime which resulted to; massive privatization of public enterprises, more emphasis to the manufacturing sector and the banking sector consolidation among the major reforms that characterized the post 2000 era.

3.4.2 Expected Signs of the Variables (A Priori Expectations)

Based on economic theory, we expect the sign of the coefficient of money supply and credit to private sector ($\beta_{2,}$ and β_3 respectively), to be positive. This is because, economic theory has established that an increase in the supply of money will stimulate economic activities, raise profit and lowers interest rate thereby making capital more accessible to manufacturing firms and hence, increase in manufacturing output. Increase credit to the private sector means more credit (capital) to the manufacturing sub sector, hence positive relationship.

On the other hand, the sign of the coefficient of lending rate and exchange rate are expected to be negative (i.e. β_4 and β_5), as there is an inverse relationship between output and the rate at which banks and non-banks financial institutions lend to private investors. Conventional economic theory shows that devaluation can generally leads to an increase in the level of output, since it can enhances production particularly in export and import competing sectors (increase competitiveness of the economy in general and manufacturing sector in particular) as such exchange rate is negatively related to output. The sign of the coefficient of the dummy variable (β_6) is expected to be positive and significant if there is any significant change between the two periods and otherwise if there is no structural shift between the periods. That is to say the coefficient of the dummy will be positive if the changes brought by the democratic government have positive impact on the manufacturing sector performance.

CHAPTER FOUR

PRESENTATION AND ANALYSIS OF DATA

4.1 INTRODUCTION

The chapter presents the empirical estimation results and other necessary tests based on the procedures stated in the methodology. This included unit root test, Johansen cointegration test, vector error correction model estimates and test for causality.

Finally, the chapter discusses the major findings and policy implications of the results.

4.2 ESTIMATION AND RESULTS

4.2.1 Results of ADF Unit Root Test

The Augmented Dickey Fuller (ADF) test was conducted at level and at first difference using both trend and intercept with the null hypothesis that, the series has unit root (not stationary) against the alternative hypothesis that the series does not have unit root (are stationary) in order to differentiate between mere correlation and an underlying causal relationship. Table 4.1 below presents the result of ADF unit root test:

Table 4.1 ADF Result

Variables	**ADF at Level**		**Variables**	**ADF at First Difference**	
	t-Statistic	Probability		t-Statistic	Probability
MSO	-0.028693	0.9954	ΔMSO	-7.721715	0.0000*
MSS	1.928066	1.0000	ΔMSS	-10.54228	0.0000*
CPS	3.505808	1.0000	ΔCPS	-6.371231	0.0000*
EXR	-2.221444	0.4722	ΔEXR	-7.394079	0.0000*
PLR	-3.943403	0.0735	ΔPLR	-8.617148	0.0000*

Source: *Extraction from estimation output using E-views 7*

Note: * shows the rejection of hypothesis at 1% level of significance

Table 4.1 above reports the result of ADF unit root test. The test indicates that, all the variables are found to be stationary in their first difference at 1% level of significance. Thus, the variables are not stationary at level but are all stationary (don't have unit root) in their first difference. As such the variables are integrated of the same order i.e *I (1) integrated of orders one.*

Table 4.2 Result of Phillips-Perron Unit Root Test

Variable	**Adj t-Statistic**	**Critical Values at 1%, 5% & 10%**	**Prob**	**Order of Cointegration**
ΔMSO	-96.16524*	-4.054393 -3.456319	0.0001	I(1)

		-3.153989		
ΔMSS	-67.40135*	-4.054393 -3.456319 -3.153989	0.0001	I(1)
ΔCPS	-105.6855*	-4.054393 -3.456319 -3.153989	0.0001	I(1)
ΔEXR	-59.07769*	-4.055416 -3.456805 -3.154273	0.0001	I(1)
ΔPLR	-57.78537*	-4.054393 -3.456319 -3.153989	0.0001	I(1)

Source: *Extraction from estimation output using E-views 7*

Note: * Shows the rejection of null hypothesis at 1% level of significance

The result of Philips-Perron unit root test as shown in table 4.2 above, revealed that all our variables are stationary at their first difference and are integrated of the same order *I(1).*

4.2.2 Result of Johansen Cointegration Result

Given that the unit root test established the variables as I(1), we proceed to apply the Johansen' approach to determine whether there is at least one combination of these variables that is I(0). The result of Juhansen cointegration test is presented in the table below:

Table 4.3 Cointegration Rank Test				
No of CE (s)	**Eigen Value**	**Trace Statistic**	**0.05 Critical Value**	**Prob ** **
None *	0.350893	83.95746	69.81889	0.0025
At most 1	0.195400	42.90254	47.85613	0.1350
At most 2	0.171755	22.24853	29.79707	0.2849
At most 3	0.044137	4.346143	15.49471	0.8737
At most 4	0.000608	0.057785	3.841466	0.8100

Source: *Extraction from estimation output using E-views 7*

Note: * Shows the rejection of null hypothesis at 5%

Table 4.3 Cointegration Max-Eigen Value Test				
No of CE (s)	**Eigen Value**	**Trace Statistic**	**0.05 Critical Value**	**Prob ** **

None *	0.350893	41.05492	33.87687	0.0059
At most 1	0.195400	20.65401	27.58434	0.2977
At most 2	0.171755	17.90239	21.13162	0.1335
At most 3	0.044137	4.288358	14.26460	0.8277
At most 4	0.000608	0.057785	3.841466	0.8100

Source: *Extraction from estimation output using E-views 7*

Note: * shows the rejection of null hypothesis at 5%

Table 4.3 and 4.4 above, reports the result of Cointegration based on Johansen's procedure. The test indicates the existence of one (1) cointegrating equation based on Trace Statistic and Max-Eigen Statistics at 5% level of significance. Thus, the null hypothesis that there is no cointegration can therefore be rejected at 5% level as both trace test and maximum eigenvalue statistics are greater than their critical values. The result therefore indicates the existence of long run relationship among the included variables.

4.2.3 LONG RUN ESTIMATES

The long run relationship of the variables from the normalized cointegration result with respect to manufacturing sector output provides the evidence regarding the long-run dynamic adjustment among manufacturing sector output as a proxy of the performance of the sector, money supply, prime lending rate, credit to private sector and the exchange rate as presented below:

Table 4.4 Long Run Estimates

MSO =	**MSS**	**CPS**	**EXR**	**PLR**	**C**
1.000000	-0.089825	0.628075	0.321195	-0.145982	-0.760833
	(0.30067)	(0.17943)	(0.08450)	(0.06207)	

Source: *Extraction from estimation output using E-views 7*

The normalized cointegration equation as presented in the table above shows the long run coefficients of our independent variables as they affect the dependent variable. The sign of the variables are reversed due to the normalization. It specifically shows

the effect of each individual variable on the dependent variable. The result of each individual variable is explained below:

1. ***Credit to Private Sector (CPS):*** the coefficient of the credit to private sector shows that there exist a positive relationship between credit and manufacturing output. The result specifically implies that a one unit increase in the rate of credits to the private sector holding the effect of other variables constant, will lead to a corresponding increase in manufacturing output by 62.8% and vice versa. This is however in conformity with theoretical postulations and confirms the result of previous studies such as that of Ernest (2013).
2. ***Prime Lending Rate (PLR)***: from the long run estimate presented in the table above, the coefficient of lending rate is negative suggesting an inverse relationship with manufacturing output. The result therefore is in conformity with economic theory and supports the findings of Ernest (2013).
3. ***Exchange Rate (EXR):*** Although conventional economic theory indicates that, devaluation can generally leads to output expansion because of the fact that, it may enhances production in export and import-competing sectors of the economy. Devaluations may also cause contractionary effect through the channel of the external debt denominated in foreign currencies. It is obvious that devaluation may increase the amount of the resources used for servicing the external debt and thus crowd out domestic investment (Morley, 1992)

The long run coefficient of the rate of exchange of the Nigerian naira against dollar as presented in the table above shows a positive relationship between exchange rate and manufacturing output.

I. This might be due to the nature of the Nigerian manufacturing sector which is highly import dependent interns of major inputs, technology and spare parts, any decrease in the value of the Naira against dollar will result to a corresponding rise in the cost of production of the manufacturers and hence decrease in its output.
II. Devaluation in Nigeria has also negatively affected the manufacturing sector by reducing its domestic competitiveness, as the output of the domestic firms cannot compete in the market with foreign imported ones in terms of price. Although imported products are better in terms of quality, there prices are dearer to that of domestically produced ones due to high cost of production.

III. Another reason as to why exchange rate devaluation exerts a negative effect to manufacturing performance in Nigeria is that it results to low profit margins in the sub sector. Profit is revenue minus cost and since devaluation result to increase in the cost of production it lowers the profit margins. Similar result was also obtained by Rogers in his study in Mexico (Rogers, 1995)

4. ***Money Supply (MSS):*** The estimate for the long run coefficient of money supply indicates a negative relationship between output in the manufacturing sector and money supply in the long run. This although does not comfort with theoretical postulations, may be due to the fact that,

   I. Although increase in the supply of money are meant to reduce the cost of money (lending rate) yet, in Nigeria due to continuous increase in the demand for money the rate of lending remains relatively constant at high level (between 21 to 13 %) which result to high cost of borrowing to the manufacturers and limit their ability to borrow capital for expansion.

   II. Constant rise in the volume of money in the economy has also resulted to high rate of inflation over the years that have rendered the value of the Naira at disadvantage compared to other currencies. This also result to high cost of production in the manufacturing sector as manufacturing firms in Nigeria depends on the importation of machines, spare parts and inputs. The result however is in line with the result of other studies such as that of Akinlo (2007).

   III. Moreover, increase in the supply of money has also resulted to constant demand for higher wages by the labour force as there is an increase in the price of goods and services which reduce their real wages due to increase in the supply of money in the economy. These altogether results to a negative response of manufacturing output to changes in money supply in Nigeria.

4.2.4 Result of Vector Error Correction Model (VECM)

The estimates of the VECM provides the short run elasticities of the variables and how output in the manufacturing sector responds to changes in its own lagged value and the lagged value of the other variables in the short run. It therefore indicates the

short run causality between money supply, exchange rate, credit and lending rate and the manufacturing sector output respectively. The table below present the detail result regarding the short run causalities:

Table 4.5 Estimates of Error Correction Model

Short Run Estimates				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob**
ECT(1)	-0.655429	0.137947	-26.49877	0.0000
D(MSO(-1))	1.775715	0.107332	16.54417	0.0000
D(MSO(-2))	0.938726	0.05048	18.59594	0.0000
D(MSO(-3))	1.696597	0.123352	13.75411	0.0000
D(MSO(-4))	0.915071	0.058325	15.68916	0.0000
D(MSS(-1))	0.355557	0.505232	0.70375	0.4836
D(MSS(-2))	0.474811	0.506212	0.937968	0.3510
D(MSS(-3))	0.435181	0.585119	0.743748	0.4591
D(MSS(-4))	0.539042	0.586515	0.919059	0.3607
D(CPS(-1))	1.360137	0.334133	4.070647	0.0001
D(CPS(-2))	0.343526	0.337635	1.017447	0.3119
D(CPS(-3))	1.475622	0.386646	3.816466	0.0003
D(CPS(-4))	0.403274	0.390928	1.031582	0.3052
D(PLR(-1))	-0.172601	0.116666	-1.479444	0.1428
D(PLR(-2))	-0.098954	0.116755	-0.847533	0.3991
D(PLR(-3))	-0.276004	0.136315	-2.024756	0.0461
D(PLR(-4))	-0.139591	0.135797	-1.02794	0.3069
D(EXR(-1))	0.324575	0.172684	1.879592	0.0637
D(EXR(-2))	0.330968	0.171207	1.933143	0.0566
D(EXR(-3))	0.860272	0.202797	4.242026	0.0001
D(EXR(-4))	0.647269	0.197647	3.274879	0.0015
Constant	-0.265996	0.05978	-4.449587	0.0000
DUMMY	0.470223	0.082606	5.692364	0.0000
R-squared		0.977879		

Adjusted R-squared	0.97468
S.E. of regression	0.395902
Sum squared resid	13.00928
Log likelihood	-40.28121
F-statistic	305.7516
Prob(F-statistic)	0.000000
Durbin-Watson stat	1.372815

Source: *Extraction from estimation output using E-views 7*

Table 4.3 above, shows the result of Error-Correction Model using four lags. From the result, the Error Correction Term which shows the speed of adjustment, is statistically significant and has a negative sign (-0.655429), this confirms that there is not any problem in the long-run equilibrium relationship between these variables. The result denotes a satisfactory convergence rate to equilibrium point per period that is about 66% of the deviation from lung run equilibrium are corrected in the next quarter. This means that full adjustment takes place at (100% adjustment) 1/65.54 * 100 = 1.53 (i.e. which means full adjustment occur every six month).

From the table also, all the estimated coefficients have the expected sign and four out of the five (lag value of MSO, CPS, EXR and PLR) variables are statistically significant and this shows that there is a short run causality running from these variables to MGDP. In other words, the result vindicates that in the short run, the value which the manufacturing output takes is influenced by these variables.

The coefficient of the dummy variable also has the correct sign (positive) and it is significant at 1% showing that there is a significant positive change between the two periods. This implies that the macroeconomic measure taking by the Nigerian government to improve the productivity of the manufacturing sector performance has positive effect.

The goodness of fit of the estimated relationship and the significance of the model as indicated by the value of the coefficient of determination (R^2 and the adjusted R^2) and F-Statistics respectively are good, the magnitude of the adjusted R^2 shows that 96% of variations in the dependent variable is explained by the explanatory variables included in the model. These all together implies that, the output of the manufacturing sector in Nigeria largely depends on the naira exchange rate, amount of credit awarded to the private sector and the commercial bank lending rate for the period under study.

4.2.5 Results of Granger Causality Test

Although our variables are correlated that does not necessarily implied causation in any aspect of the word. Granger (1969) in a paper introduced the approach which tries to answer the question of whether variable x causes y in order to measure the amount of the present values of y that can be explained by past values of y and then to see whether adding lagged values of x can improve the explanation. The variable y is said to be "Granger-caused" by x if x (variable x) has an incremental value in the prediction of y. It is noteworthy that the statement "x Granger causes y" does not mean that the variable y is the effect or the result of x. the result of Granger causality test is however, presented in the table below:

Table 4.6 Result of Granger Causality/Block Exogeneity Wald Tests

Dependent Variable: D(MSO)				**Dependent Variable: D(MSS)**			
Excluded	**Chi-sq**	**Df**	**Prob.**	**Excluded**	**Chi-sq**	**Df**	**Prob.**
D(MSS)	2.264030	4	0.6873	D(MSO)	5.871379	4	0.2090
D(CPS)	12.36099	4	0.0149	D(CPS)	2.183622	4	0.7020
D(PLR)	0.677025	4	0.0441	D(PLR)	4.012199	4	0.4044
D(EXR)	1.922481	4	0.0500	D(EXR)	0.827937	4	0.9347
All	16.16989	16	0.0512	All	12.23482	16	0.7277
Dependent Variable: D(CPS)				**Dependent Variable: D(PLR)**			

Excluded	Chi-sq	Df	Prob.	Excluded	Chi-sq	Df	Prob.
D(MSO)	12.42033	4	0.0145	D(MSO)	1.038224	4	0.9039
D(MSS)	6.246090	4	0.1815	D(MSS)	21.70587	4	0.0002
D(PLR)	6.240801	4	0.1819	D(CPS)	4.789276	4	0.3096
D(EXR)	2.047240	4	0.7271	D(EXR)	16.12294	4	0.0029
All	19.35754	16	0.2506	All	45.42555	16	0.0001

Dependent Variable: D(EXR)

Excluded	Chi-sq	df	Prob.
D(MSO)	3.207046	4	0.5238
D(MSS)	2.580254	4	0.6303
D(CPS)	1.134902	4	0.8887
D(PLR)	3.896820	4	0.4201
All	9.476732	16	0.8925

Source: *Extraction from estimation output using E-views 7*

The result of granger causality as presented by the table above shows that, there is a unidirectional causality running from, exchange rate, lending rate and Credit to Private Sector to Manufacturing Sector Output. There is also a unidirectional causality on the other hand between Money supply and exchange rate to lending rate. Thus, credit to private sector, exchange rate and lending rate are the variables that granger causes MSO in our model. It also shows that, lending rate is granger caused by both exchange rate and money supply. This implies that passed values of lending rate and exchange rate have a predictive ability in determining the present values of manufacturing output. In the same vein also, past values of money supply and exchange rate helps in the prediction of the future value of lending rate. Thus, there is a strong dynamic causal relationship among the variables in our model.

4.2.6 Estimates for Variance Decomposition

The forces error was used to further interpret the model in the generalized ordering for the 12 periods and the analysis is based on three periods of each term, where 1^{st} to 4^{th} periods represent the short term, 5^{th} to 8^{th} periods for medium term and 9^{th} to 12^{th} periods for long term. Hence, the figures given at each of the last periods are the basis of this analysis.

Table 4.7: Variance Decomposition of MSO					
Period	MSO	MSS	CPS	EXR	PLR
Short term	100.0000	0.000000	0.000000	0.000000	0.000000
Medium term	89.30017	0.858876	1.669998	5.373033	2.797927
Long term	89.00997	0.818200	1.629318	5.655741	2.886773

Source: *extract from estimation output using E-views 7*

From table 4.6.1 we can see that in the short term MSO is self explained accounting for 100% of variations in its self, but this declined to 89 in the medium and long term period. In addition, we can observe that EXR (exchange rate) and PLR (lending rate) were the important factors accounting for 5 and 2 percent variation in MSO in the medium and long term respectively. Moreover, MSS was the least influential factor accounting for between 0.00 to 0.85 percent of the variations is the sectors' output over the forecast period.

4.3 DISCUSSIONS AND POLICY IMPLICATIONS

The result of johansen cointegration test confirms the existence of long run equilibrium relationship among the variables in the model. The estimate for the normalized cointegration which provides the long run estimates of the variables indicates a negative relationship between output in the manufacturing sector and money supply in the long run. This although does not comfort with theoretical postulations, may be due to the fact that, although increase in the supply of money are meant to reduce the cost of money (lending rate) yet, in Nigeria the rate keeps on increasing which result to high cost of borrowing to the manufacturers and limit their ability to borrow capital for expansion. Constant rise in the volume of money in the economy has also resulted to high rate of inflation over the years that have rendered the value of the Naira at disadvantage compared to other currencies. This also result to high cost of production in the manufacturing sector as manufacturing firms in Nigeria highly depends on the importation of machines, spare parts and inputs.

Exchange rate which is postulated to have an inverse (negative) relationship with output has shown the opposite. The long run coefficient of the rate of exchange of the Nigerian naira against dollar presented a positive relationship. This is although devaluations are meant to raise output of the sector in the Nigerian case it decreases

output given the nature of the Nigerian manufacturing sector which is highly import dependent interns of major inputs, technology and spare parts, any decrease in the value of the Naira against dollar will result to a corresponding rise in the cost of production of the manufacturers and hence decrease in its output.

Devaluation in Nigeria has also negatively affected the manufacturing sector by reducing its competitiveness not only in the foreign markets but domestically, as the output of the domestic firms cannot compete in the market with foreign imported ones in terms of price. Although imported goods are better in terms of quality, there prices are dearer to that of domestically produced ones due high cost of production. Another reason as to why exchange rate devaluation exerts a negative effect to manufacturing performance in Nigeria is that it results to low profit margins in the sub sector. Profit is revenue minus cost and since devaluation result to increase in the cost of production it lowers the profit margins.

The statistically significance of the error correction term indicates that the variables are linearly interdependent and are related in the long run. The positive and significant effect of the coefficient of credit implies that manufacturing output in Nigeria is significantly influenced by the amount of credit awarded to the private sector. Lending rate also, presents a significant negative relationship with output in the manufacturing sector in Nigeria. This further suggests that high lending rate in the country has significantly resulted to decimal performance of the sector in terms of its contributions to the gross domestic product. Although the government in Nigeria has always devalued the naira in order to improve the competitiveness of its export and discourage imports of finished products shown by the significant positive relationship between exchange rate and manufacturing output in our model, this has not resulted to any meaningful improvements in the level of output of the sector because devaluing value of the naira has always resulted to high cost of production, high lending rate and constant demand of higher wages by labour.

Moreover, from the result of granger causality it is clear that exchange rate and prime lending rate granger caused manufacturing sector output. This implies that lagged values of exchange rate and the lending rate are important variables in explaining the future values of the output in the manufacturing sector. Therefore the government can use both variables (exchange rate and lending rate) to influence changes in the

manufacturing sector. Exchange rate and money supply also granger causes lending rate in the model. This also implies that, the government can use exchange rate and money supply policies in order to influence the rate at which banks lend to private sector and hence influencing credit to the desired directions and thereby indirectly influencing the performance of the economy as a whole and manufacturing sub sector inclusive.

CHAPTER FIVE

SUMMSRY CONCLUSION AND RECOMMENDATIONS

5.1 SUMMARY

The study empirically examined the impact of monetary and exchange rate stability on the manufacturing performance of the Nigerian economy from 1988Q1 to 2012Q4. The study specifically examined the long run relationship and nature of causality

between manufacturing sector output and money supply, exchange rate, credit to commercial sector and the lending rate under Vector Error Correction Technique. Data used for the study were sourced from the Central Bank of Nigeria website (CBN Statistical Databank). Although there are numerous studies dedicated to manufacturing sector performance, the review of related literature shows that, most of these studies cantered at studying factors such as power supply, infrastructure, trade liberalization and foreign direct investment while they give little attention to macroeconomic factors that may also influence the productivity of the sector. This study therefore is an attempt to pill such gaps in the literature.

In order to conduct an econometrics analysis, our data was tested for unit root using Augmented Dickey-Fuller and Phillips-Perron tests in order to establish the stationarity or otherwise of the data. The result from both tests shows that the data was not stationary at level but are stationary at the first difference I(1). A test for cointegration was also conducted in order to find whether a combination of the non-stationary data will be stationary. The test confirms the existence of one cointegrating equation thereby providing evidence for the long run relationship among the variables.

Having confirmed the long run relationship in the model we estimated the model using VEC which described how the short run and long run behaviour of the variables are reconciled. The error correction term, which measure the speed of adjustment among the variables shows that 65% of the disequilibrium are corrected the following period. The result of Granger Causality also provides evidence for the existence of unidirectional causality running from exchange rate, credit to private sector and the lending rate to manufacturing sector performance. This is further buttressed by the result of variance decomposition as it shows that exchange rate and lending rate as the major variables explaining variations in manufacturing sector output in the model over the period of study. We therefore conclude that manufacturing output respond to changes in exchange rate, lending rate and credit to private sector.

5.2 CONCLUSION

Based on our findings, it was observed that, Nigeria's exchange rate management policies over the period favour the continues depreciation of the Naira exchange rate, but that has not resulted to significant growth of the manufacturing sector as the

contribution of the sector to GDP has continuously felled over the period. Our result therefore suggest the need for currency appreciation rather than depreciation as the sector depends heavily on the importation of equipments, machineries as well as most of its raw materials. The significant negative effect of lending rate on the manufacturing performance of Nigeria shows that, credit is still costly to access by the manufacturers and this contribute to the marginal performance of the sector. Both money supply and credit to private sector exert an insignificant effect in stimulating output of the manufacturing sector. We can therefore conclude that both monetary and exchange rate policies in Nigeria were not successful in achieving the growth of the manufacturing sector in Nigeria as expected. Thus, there is the need for the review of the current exchange rate policy towards appreciation and a monetary discipline that will restore the value of the naira.

5.3 RECOMMENDATIONS

Although the performance of the manufacturing sector in Nigeria over the years has been on the decline, there are still huge prospects in the future for the performance of the sector and its contribution to gross domestic product. Based on that, the study therefore recommends that;

1. Given that the manufacturing sector is highly dependent on the importation of raw materials and spare parts, efforts should be geared towards reducing the import dependence of the sector through improving the level of technology, improving agricultural productivity and domestic sourcing of raw materials in order to reduced high import dependence that is volatile to exchange rate fluctuations.
2. More credit should also be geared to the private sector in general and manufacturing sub sector in particular, in order to increase the accessibility of the manufacturers to sources of capital as capital still remain a major constraint to manufacturing activities. A major policy in this direction is that the vast resources with Pension board, National Health Insurance, National Housing Fund Schemes and the likes should be channelled to the real sector and that all deposit money Banks should be quoted on the stock exchange so that they can play active roles in the bond market for on-lending to the real sector.

3. Monetary policies should also be centred towards maintaining stable inflation rate that will ensure price stability and restore confidence on the naira. As inflation has high effect in terms of both the consumer and producer sides. Therefore any policy that will curb inflation will surely increase output.
4. Interest rate must also be kept at a bearable rate if the manufacturing output is to be improved as we have seen from our result that interest rate have negative impact on output because high interest rate means high cost of doing business and low profit margins and hence discourage manufacturing activities.

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APPENDIXES

Appendix I

(Result of ADF Unit Root Test (Variables at Level))

Null Hypothesis: MSO has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 7 (Automatic - based on SIC, maxlag=12)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-0.028693	0.9954
Test critical values:	1% level	-4.052411	

	5% level	-3.455376
	10% level	-3.153438

*MacKinnon (1996) one-sided p-values.
Null Hypothesis: MSS has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=12)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		1.928066	1.0000
Test critical values:	1% level	-4.046072	
	5% level	-3.452358	
	10% level	-3.151673	

*MacKinnon (1996) one-sided p-values.
Null Hypothesis: CPS has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 10 (Automatic - based on SIC, maxlag=12)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		3.505808	1.0000
Test critical values:	1% level	-4.055416	
	5% level	-3.456805	
	10% level	-3.154273	

*MacKinnon (1996) one-sided p-values.
Null Hypothesis: EXR has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 1 (Automatic - based on SIC, maxlag=12)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.221444	0.4722
Test critical values:	1% level	-4.054393	
	5% level	-3.456319	
	10% level	-3.153989	

*MacKinnon (1996) one-sided p-values.
Null Hypothesis: PLR has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 1 (Automatic - based on SIC, maxlag=12)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.943403	0.0135
Test critical values:	1% level	-4.046925	
	5% level	-3.452764	
	10% level	-3.151911	

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

Result of ADF Unit Root Test (Variables at First Difference)

Null Hypothesis: D(MSO) has a unit root

Exogenous: Constant, Linear Trend
Lag Length: 6 (Automatic - based on SIC, maxlag=12)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-7.721715	0.0000
Test critical values:	1% level	-4.052411	
	5% level	-3.455376	
	10% level	-3.153438	

*MacKinnon (1996) one-sided p-values.
Null Hypothesis: D(MSS) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=12)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-10.54228	0.0000
Test critical values:	1% level	-4.046925	
	5% level	-3.452764	
	10% level	-3.151911	

*MacKinnon (1996) one-sided p-values.
Null Hypothesis: D(CPS) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 12 (Automatic - based on SIC, maxlag=12)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.371231	0.0000
Test critical values:	1% level	-4.059734	
	5% level	-3.458856	
	10% level	-3.155470	

*MacKinnon (1996) one-sided p-values.
Null Hypothesis: D(EXR) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=12)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-7.394079	0.0000
Test critical values:	1% level	-4.054393	
	5% level	-3.456319	
	10% level	-3.153989	

*MacKinnon (1996) one-sided p-values.
Null Hypothesis: D(PLR) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=12)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-8.617148	0.0000
Test critical values:	1% level	-4.046925	
	5% level	-3.452764	
	10% level	-3.151911	

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

Appendix I (B) (PP Test of Stationarity Result)

Null Hypothesis: D(MSO) has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 13 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-96.16524	0.0001
Test critical values:	1% level	-4.054393	
	5% level	-3.456319	
	10% level	-3.153989	

*MacKinnon (1996) one-sided p-values.
Null Hypothesis: D(MSS) has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 30 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-67.40135	0.0001
Test critical values:	1% level	-4.054393	
	5% level	-3.456319	
	10% level	-3.153989	

*MacKinnon (1996) one-sided p-values.
Null Hypothesis: D(PLR) has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 35 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-57.78537	0.0001
Test critical values:	1% level	-4.054393	
	5% level	-3.456319	
	10% level	-3.153989	

*MacKinnon (1996) one-sided p-values.
Null Hypothesis: D(CPS) has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 91 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-105.6855	0.0001
Test critical values:	1% level	-4.054393	
	5% level	-3.456319	
	10% level	-3.153989	

*MacKinnon (1996) one-sided p-values.
Null Hypothesis: D(EXR) has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 54 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-59.07769	0.0001
Test critical values:	1% level	-4.055416	
	5% level	-3.456805	
	10% level	-3.154273	

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

Appendix II (Johansen Cointegration Test Result)

Date: 12/03/14 Time: 02:51
Sample (adjusted): 14 108
Included observations: 95 after adjustments
Trend assumption: Linear deterministic trend
Series: MGDP M2 CPS EX LR
Lags interval (in first differences): 1 to 4

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.350893	83.95746	69.81889	0.0025
At most 1	0.195400	42.90254	47.85613	0.1350
At most 2	0.171755	22.24853	29.79707	0.2849
At most 3	0.044137	4.346143	15.49471	0.8737
At most 4	0.000608	0.057785	3.841466	0.8100

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

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.350893	41.05492	33.87687	0.0059
At most 1	0.195400	20.65401	27.58434	0.2977
At most 2	0.171755	17.90239	21.13162	0.1335
At most 3	0.044137	4.288358	14.26460	0.8277
At most 4	0.000608	0.057785	3.841466	0.8100

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

Unrestricted Cointegrating Coefficients (normalized by b'*S11*b=I):

MGDP	M2	CPS	EX	LR
0.000614	-4.75E-06	4.35E-06	0.022822	0.113625
0.001012	-1.23E-06	7.03E-07	-0.018625	-0.323572
0.003230	-3.20E-06	2.00E-06	0.029211	0.243833
-0.000692	-5.84E-07	6.43E-07	0.025957	-0.070201
0.000198	-2.22E-06	2.55E-06	0.005702	-0.003021

Unrestricted Adjustment Coefficients (alpha):

D(MGDP)	-100.3026	-289.8147	-173.7328	108.5032	-4.006327
D(M2)	-106460.6	-1495.109	63025.13	10072.62	-2381.219
D(CPS)	-164992.7	-11645.82	-18807.96	-24438.94	5.577036
D(EX)	0.287207	0.688296	-1.085647	-0.332810	-0.087242
D(LR)	-0.147121	0.632142	-0.276500	0.118921	0.014975

1 Cointegrating Equation(s): Log likelihood -3876.840

Normalized cointegrating coefficients (standard error in parentheses)

MGDP	M2	CPS	EX	LR
1.000000	0.089825	- 0.628075	-0.321195	0.1459982
	(0.05123)	(0.00123)	(0.02845)	(0.03407)

Adjustment coefficients (standard error in parentheses)

D(MGDP)	-0.061602
	(0.06885)
D(M2)	-65.38415
	(16.9691)
D(CPS)	-101.3324
	(18.5568)
D(EX)	0.000176
	(0.00036)
D(LR)	-9.04E-05
	(0.00013)

Appendix III (VECM Estimation Eviews Result)

Vector Error Correction Estimates
Date: 01/18/15 Time: 20:25
Sample (adjusted): 5 100
Included observations: 96 after adjustments
Standard errors in ( ) & t-statistics in [ ]

Cointegrating Eq:	CointEq1
MSO(-1)	1.000000
MSS(-1)	-0.109
	(0.23022)
	[-0.47346]
CPS(-1)	0.585085
	(0.13736)
	[4.25941]
PLR(-1)	-0.090689
	(0.04768)
	[-1.90209]
EXR(-1)	0.089328
	(0.06880)
	[1.29832]
C	-0.746162

Error Correction:	D(MSO)	D(MSS)	D(CPS)	D(PLR)	D(EXR)
CointEq1	-0.655429	0.043739	-0.13006	0.252846	0.161367

	(0.13795)	(0.02842)	(0.04140)	(0.12798)	(0.08294)
	[-26.4988]	[1.53885]	[-3.14186]	[1.97562]	[1.94562]
D(MSO(-1))	1.775715	-0.05097	0.081756	-0.2145	-0.1376
	(0.10733)	(0.02212)	(0.03221)	(0.09958)	(0.06453)
	[16.5442]	[-2.30494]	[2.53828]	[-2.15409]	[-2.13234]
D(MSO(-2))	0.938726	-0.03494	0.020641	-0.09888	-0.05419
	(0.05048)	(0.01040)	(0.01515)	(0.04683)	(0.03035)
	[18.5959]	[-3.35938]	[1.36255]	[-2.11138]	[-1.78536]
D(MSO(-3))	1.713723	13.81481	54.76882	0.000450	0.000237
	(0.11661)	(25.5157)	(26.5123)	(0.00043)	(0.00018)
	[14.6960]	[0.54142]	[2.06579]	[1.03895]	[1.32144]
D(MSO(-4))	0.881798	5.925154	20.93021	0.000239	0.000108
	(0.06189)	(13.5416)	(14.0704)	(0.00023)	(9.5E-05)
	[14.2484]	[0.43755]	[1.48753]	[1.04013]	[1.13216]
D(MSS(-1))	0.355557	-0.75024	-0.21328	-0.22797	0.169771
	(0.50523)	(0.10410)	(0.15162)	(0.46874)	(0.30376)
	[0.70375]	[-7.20686]	[-1.40669]	[-0.48634]	[0.55890]
D(MSS(-2))	0.474811	-0.3166	-0.21318	0.471486	0.450536
	(0.50621)	(0.10430)	(0.15191)	(0.46965)	(0.30435)
	[0.93797]	[-3.03539]	[-1.40331]	[1.00392]	[1.48031]
D(MSS(-3))	-0.001671	-0.01937	0.076843	1.45E-07	-8.71E-07
	(0.00061)	(0.13382)	(0.13905)	(2.3E-06)	(9.4E-07)
	[-2.73255]	[-0.14477]	[0.55264]	[0.06381]	[-0.92556]
D(MSS(-4))	-0.001298	0.244573	0.295102	1.40E-06	5.10E-07
	(0.00062)	(0.13465)	(0.13991)	(2.3E-06)	(9.5E-07)
	[-2.10854]	[1.81634]	[2.10922]	[0.61435]	[0.53903]
D(CPS(-1))	1.360137	0.029103	-0.78778	0.342238	0.135115
	(0.33413)	(0.06885)	(0.10027)	(0.31000)	(0.20089)
	[4.07065]	[0.42272]	[-7.85656]	[1.10400]	[0.67257]
D(CPS(-2))	0.343526	0.021691	-0.29164	0.237866	0.159686
	(0.33764)	(0.06957)	(0.10132)	(0.31325)	(0.20300)
	[1.01745]	[0.31180]	[-2.87840]	[0.75936]	[0.78664]
D(CPS(-3))	0.001116	0.199611	0.354690	-1.91E-06	1.44E-07
	(0.00050)	(0.10931)	(0.11358)	(1.9E-06)	(7.7E-07)
	[2.23458]	[1.82613]	[3.12290]	[-1.02820]	[0.18696]

D(CPS(-4))	0.000766	0.013966	0.033254	4.20E-07	8.56E-09
	(0.00053)	(0.11590)	(0.12043)	(2.0E-06)	(8.1E-07)
	[1.44615]	[0.12049]	[0.27613]	[0.21346]	[0.01051]
D(PLR(-1))	-0.172601	-0.01675	-0.07419	-0.54791	0.018406
	(0.11667)	(0.02404)	(0.03501)	(0.10824)	(0.07014)
	[-1.47944]	[-0.69691]	[-2.11903]	[-5.06201]	[0.26240]
D(PLR(-2))	-0.098954	-0.01083	-0.0176	-0.2023	0.046812
	(0.11675)	(0.02406)	(0.03504)	(0.10832)	(0.07020)
	[-0.84753]	[-0.44997]	[-0.50225]	[-1.86755]	[0.66687]
D(PLR(-3))	-2.203025	1493.656	4607.771	-0.13489	0.172569
	(72.9585)	(15964.0)	(16587.5)	(0.27090)	(0.11224)
	[-0.03020]	[0.09356]	[0.27779]	[-0.49794]	[1.53753]
D(PLR(-4))	14.41909	8556.299	26967.84	0.215558	-0.03746
	(72.2627)	(15811.7)	(16429.3)	(0.26832)	(0.11117)
	[0.19954]	[0.54114]	[1.64145]	[0.80337]	[-0.33695]
D(EXR(-1))	0.324575	-0.03083	0.005977	-0.02464	-0.53405
	(0.17268)	(0.03558)	(0.05182)	(0.16021)	(0.10382)
	[1.87959]	[-0.86636]	[0.11534]	[-0.15380]	[-5.14380]
D(EXR(-2))	0.330968	-0.01344	-0.05121	-0.0014	-0.29772
	(0.17121)	(0.03528)	(0.05138)	(0.15884)	(0.10294)
	[1.93314]	[-0.38088]	[-0.99678]	[-0.00884]	[-2.89225]
D(EXR(-3))	-24.48606	-9654.12	-7829.54	0.347529	0.002079
	(30.2192)	(6612.25)	(6870.50)	(0.11221)	(0.04649)
	[-0.81028]	[-1.46004]	[-1.13959]	[3.09722]	[0.04471]
D(EXR(-4))	-6.631315	3999.158	10111.38	-0.14763	0.015597
	(30.7191)	(6721.63)	(6984.15)	(0.11406)	(0.04726)
	[-0.21587]	[0.59497]	[1.44776]	[-1.29428]	[0.33004]
C	-0.265996	0.002789	-0.00888	0.019600	0.007770
	(0.05978)	(0.01232)	(0.01794)	(0.05546)	(0.03594)
	[-4.44959]	[0.22640]	[-0.49496]	[0.35339]	[0.21619]
DUMMY	0.470223	-0.00459	0.014906	-0.03047	-0.01585
	(0.08261)	(0.01702)	(0.02479)	(0.07664)	(0.04967)
	[5.69236]	[-0.26982]	[0.60130]	[-0.39755]	[-0.31922]
R-squared	0.977879	0.469824	0.507242	0.335906	0.283579
Adj. R-squared	0.974680	0.393172	0.435999	0.239893	0.180000

Sum sq. resids	13.00928	0.552306	1.171542	11.19778	4.702620
S.E. equation	0.395902	0.081574	0.118806	0.367305	0.238030
F-statistic	305.7516	6.129308	7.119961	3.498530	2.737799
Log likelihood	-40.28121	111.3660	75.27120	-33.0837	8.560862
Akaike AIC	1.110025	-2.04929	-1.29732	0.960078	0.092482
Schwarz SC	1.457281	-1.70204	-0.95006	1.307333	0.439738
Mean dependent	0.002188	-0.0003	0.000239	0.001006	-0.00155
S.D. dependent	2.488045	0.104717	0.158198	0.421298	0.262860

Determinant resid covariance (dof adj.)	6.61E-08
Determinant resid covariance	3.19E-08
Log likelihood	147.3632
Akaike information criterion	-1.61173
Schwarz criterion	0.258104

Appendix IV

(VEC Granger Causality Eviews Result)

VEC Granger Causality/Block Exogeneity Wald Tests
Date: 02/01/15 Time: 21:46
Sample: 1 100
Included observations: 94

Dependent variable: D(MSO)

Excluded	Chi-sq	df	Prob.
D(MSS)	2.264030	4	0.6873
D(CPS)	12.36099	4	0.0149
D(PLR)	0.677025	4	0.0441
D(EXR)	1.922481	4	0.0500
All	16.16989	16	0.0512

Dependent variable: D(MSS)

Excluded	Chi-sq	df	Prob.
D(MSO)	5.871379	4	0.2090
D(CPS)	2.183622	4	0.7020
D(PLR)	4.012199	4	0.4044
D(EXR)	0.827937	4	0.9347
All	12.23482	16	0.7277

Dependent variable: D(CPS)

Excluded	Chi-sq	df	Prob.
D(MSO)	12.42033	4	0.0145
D(MSS)	6.246090	4	0.1815

D(PLR)	6.240801	4	0.1819
D(EXR)	2.047240	4	0.7271
All	19.35754	16	0.2506

Dependent variable: D(PLR)

Excluded	Chi-sq	df	Prob.
D(MSO)	1.038224	4	0.9039
D(MSS)	21.70587	4	0.0002
D(CPS)	4.789276	4	0.3096
D(EXR)	16.12294	4	0.0029
All	45.42555	16	0.0001

Dependent variable: D(EXR)

Excluded	Chi-sq	df	Prob.
D(MSO)	3.207046	4	0.5238
D(MSS)	2.580254	4	0.6303
D(CPS)	1.134902	4	0.8887
D(PLR)	3.896820	4	0.4201
All	9.476732	16	0.8925

Appendix V (Result of VEC Residual Serial Autocorrelation)

VEC Residual Serial Correlation LM Tests
Null Hypothesis: no serial correlation at lag order h
Date: 01/18/15 Time: 20:38
Sample: 1 100
Included observations: 96

Lags	LM-Stat	Prob
1	78.04642	0.0000
2	52.48327	0.0010
3	27.23008	0.3445
4	10.78278	0.9939

Probs from chi-square with 25 df.

Appendix VI (Result of Residual Heteroscedasticity)

VEC Residual Heteroskedasticity Tests: Includes Cross Terms
Date: 01/18/15 Time: 20:39
Sample: 1 100
Included observations: 96

Joint test:

Chi-sq	df	Prob.
1377.003	1335	0.2069

Individual components:

Dependent	R-squared	F(89,6)	Prob.	Chi-sq(89)	Prob.
res1*res1	0.996383	18.57335	0.0007	95.65281	0.2958
res2*res2	0.893681	0.566673	0.8845	85.79337	0.5766
res3*res3	0.989494	6.349229	0.0130	94.99139	0.3124
res4*res4	0.831006	0.331509	0.9901	79.77661	0.7474
res5*res5	0.993417	10.17273	0.0036	95.36799	0.3029
res2*res1	0.941676	1.088462	0.5146	90.40087	0.4387
res3*res1	0.996705	20.39283	0.0005	95.68368	0.2951
res3*res2	0.978702	3.098006	0.0765	93.95544	0.3392
res4*res1	0.972139	2.352315	0.1395	93.32536	0.3561
res4*res2	0.867163	0.440092	0.9564	83.24766	0.6519
res4*res3	0.944084	1.138253	0.4859	90.63210	0.4319
res5*res1	0.993406	10.15610	0.0036	95.36696	0.3029
res5*res2	0.982319	3.745417	0.0491	94.30260	0.3301
res5*res3	0.994738	12.74420	0.0019	95.49484	0.2997
res5*res4	0.950343	1.290204	0.4084	91.23290	0.4145