

**IMPACT OF FOREIGN EXCHANGE RATE ON
PERFORMAMCE OF MANUFACTURING SECTOR IN
NIGERIA**

BY

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PG/15/16/239691

**BEING A DISSERTATION SUBMITTED TO THE POST GRADUATE SCHOOL,
DELTA STATE UNIVERSITY, ABRAKA IN PARTIAL FULFILMENT OF THE
REQUIREMENTS FOR THE AWARD OF THE DEGREE OF MASTER OF
SCIENCE (M.Sc) DEGREE IN BANKING AND FINANCE.**

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FEBRUARY, 2018

DECLARATION

I hereby declare that this dissertation is my original work and has not been previously presented wholly or in part for the award of other degrees.

OLABODE ESTHER AFOLAKEMI

Signature.....

Date.....

DEDICATION

To God Almighty.

ACKNOWLEDGEMENTS

I wish to acknowledge all those who have contributed in one way or the other towards the successful completion of this academic programme.

Special thanks to the Dean of Faculty of Management Sciences Prof. (Mrs.) R. N Okoh, the Head of department Dr. C.C Osuji, Faculty Post graduate Coordinator Dr. (Mrs.) A.C Onuorah, my supervisor Dr. C.C Osuji, who provided me with direction, technical knowledge and confidence throughout this programme. To Dr. Victor Ehiedu, Dr. Andrew O. Agbada, Mr. A. Eriyakpor, Mr. I. Eferakaya, Mr. E. Ugherughe, Mr. Enakirerhi Lucky and other lecturers in the Faculty of Management Sciences. Also to Emordi Bidget, Omovo Charles Mercy, Okafor Drocas, Akin Dayo (non-teaching staff) in the Department of Accounting, Banking & Finance, Delta State University, Asaba Campus, thanks a lot for your utmost support and input.

Also to my parents Mr. and Mrs. Olabode, my siblings, and friends, God bless you all.

ABSTRACT

This study the impact of foreign exchange rate on performance of manufacturing sector in Nigeria. The study spanned from 1990-2016. The independent variables used for the study are real effective exchange rate, parallel exchange rate, interest rate, inflation rate, money supply while the dependent variable is returns on equity for fifteen manufacturing firms in Nigeria. Time series data were used and gotten from CBN Statistical Bulletin 2016 and annual report of the firms under study. The study applied E-view 7.0 version and the estimation technique applied are ordinary least square (OLS), diagnostic test, serial correlation test, stability test, unit root test, granger causality and co integration test. The result revealed the p-value of real effective exchange rate (REER) is 0.036, parallel exchange rate (PER) is 0.000, interest rate (INT) 0.031, inflation rate (INF) 0.000, money supply (MSP) 0.017. The result also reveals that all the independent variables under study have significant impact on returns on equity of manufacturing firms in Nigeria because their p-values are all less than 5% significant level. The normality test and suggest that the series distribution is normal as the p-value is 0.389 which is greater than 5% significant level, we accept H_0 which states that the residuals are normally distributed and it is desirable and further connote that the influence of other omitted and neglected variables is small and at best random. While serial correlation test and shows that the p-value of the f-statistics is 0.122 which is greater that the critical value of 5%, we conclude by accepting H_0 that there is no presence of serial correlation which is desirable and implies that the variables are independently distributed. The study recommended that the monetary authority should continue to initiate policies that will stabilize exchange rate and remove negative effect of exchange rate fluctuations on Nigeria's manufacturing performance.

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CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

The desire of every developing country like Nigeria is to ensure rapid industrialization. It is logical to say that industrialization if correctly harnessed can transform and stabilize a country structurally. For these developing economies, industrialization is seen as a conscious effort of growing the manufacturing sector of the economy. Hence, industrial reforms and policies are tailored to have a strong impact on manufacturing outputs.

Lawal (2016) stated that in Nigeria, the government and economic experts have emphasized the role that industrialization and manufacturing can play in the structural transformation of the economy. The industrial policy for Nigeria launched in 1988 opined that its major goal is to achieve an accelerated pace of industrial development for the nation making the industrial sector the main source of strength for the economy. Hence, several fiscal, monetary, exchange rate and commercial policies and measures have been adopted to encourage industrialization within the ambit of available resources.

To resolve the bottlenecks and mark a watershed in the evolution of the manufacturing sector of Nigeria; the Structural Adjustment Program (SAP) was embarked on in July 1986 with a primary objective of removing the structural distortions and bottlenecks occasioned by Government controls with the knowledge that foreign exchange rate is a major determinant in the efficient allocation and utilization of scarce resources to enhance the flow of capital into a country, stimulating domestic industrial production, promotion of export, create a favourable purchasing power, favourable balance of payment, prices of goods and services, import structure, export

earnings, government revenues, external reserves and the ability of local manufacturers to compete with their foreign counterpart.

Foreign exchange rate refers to the price of one currency (the domestic currency) in terms of another (the foreign currency). Foreign exchange rate plays a key role in international economic transactions. Movements in foreign exchange rate have ripple effects on other economic variables such as interest rate, inflation rate, import, export, output, unemployment, money supply, etc. These facts underscore the importance of exchange rate to the economic well-being of every country that opens its doors to international trade in goods and services. The importance of exchange rate derives from the fact that it connects the price systems of two different countries making it possible for international trade to make direct comparison of traded goods. In other words, it links domestic prices with international prices. Through its effects on the volume of imports and exports, exchange rate exerts a powerful influence on a country's balance of payments position.

According to Chong and Tan (2016) empirical analysis revealed that foreign exchange rate is responsible for changes in macroeconomic fundamentals for the developing economies. It is relevant to establish that foreign exchange rate fluctuations influence domestic prices through their effects on aggregate supply and demand. In general, when a currency depreciates it will result in higher import prices if the country is an international price taker, while lower import prices result from appreciation. The potentially higher cost of imported inputs associated with exchange rate depreciation increases marginal costs and leads to higher price of domestically produced goods (Kandil, 2014). Also, import-competing firms might increase prices in response to foreign competitor price increases to improve profit margins. However, the extent of such price adjustment depends on a variety of factors such as market structure, the relative number of domestic and

foreign firms in the market, the nature of government exchange rate policy and product substitutability, (Fouquin, Sekkat, Mansour, Mulder, and Nayman, 2012).

The Manufacturers Association of Nigeria (MAN) (2012) in a survey carried out as part of its membership operational audit in January 2010, recorded that of the 2780 registered members, a total of 839 (30.2%) manufacturing firms closed their factories in 2009. This is due to their inability to cope with the challenges posted by the harsh operating environment in Nigeria; which include the exchange rate management problems and infrastructural decay. In the annual report of MAN for 2006, it was also claimed that the job loss in the sector between 1983 and January 2006 was estimated at 4.2 million. In addition, in the Newsletter edition of the Association for March, 2010, it was reported that one million jobs have been lost in the sector between 2006 and 2010.

In the bid to achieve macroeconomic stability, Nigeria's monetary authorities have adopted various exchange rate arrangements over the years. It shifted from a fixed regime in the 1960s to a pegged arrangement between the 1970s and the mid-1980s, and finally, to the various types of the floating regime since 1986, following the adoption of the Structural Adjustment Programme (SAP). The fixed exchange rate regime induced an overvaluation of the naira and was supported by exchange control regulations that engendered significant distortions in the economy.

However, for the purpose of this research the independent variable is foreign exchange rate, which the researcher intends to use proxies like parallel rate, real effective exchange rate, interest rate, inflation rate, money supply. While performance of manufacturing sector will be proxy by returns on equity of the manufacturing firms under study.

The real effective exchange rate is the weighted average of a country's currency relative to an index or basket of other major currencies, adjusted for the effects of inflation. The weights are

determined by comparing the relative trade balance of a country's currency against each country within the index.

Parallel exchange rate: it is expedient to note that an illegal market determines parallel exchange rate. It is the rate at which one currency is exchanged for another.

Interest rate is the percentage of [principal](#) charged by the lender for the use of its money. The principal is the amount of money lent. A country's [central bank](#) sets interest rates. In the United States, the [fed funds rate](#) is that guiding rate. It's what banks charge each other for overnight loans. The [Federal Reserve](#) requires banks to maintain 10 percent of total deposits in reserve each night. Otherwise, they would lend out every single penny they have. Interest rates make loans more expensive. When [interest rates](#) are high, fewer people and businesses can afford to borrow. That lowers the amount of credit available to fund purchases, slowing consumer demand. At the same time, it encourages more people to save because they receive more on their [savings rate](#).

Inflation rate is a sustained increase in the general [price level](#) of goods and services in an economy over a period of time. When the price level rises, each unit of currency buys fewer goods and services; consequently, inflation reflects a reduction in the [purchasing power](#) per unit of money, it's a loss of [real value](#) in the medium of exchange and unit of account within the economy, Paul H. Walgenbach, Norman E. Dittrich and Ernest I. Hanson, (2013).

Money supply: The introduction of money is a substitute to a barter trade system which was a very important event in the history of finance. Finance is nothing but money needed to consummate economic and business, transactions and exchange processes for Economic development (Osiegbu and Onuorah 2012). Money supply is the entire stock of currency and other liquid instruments circulating in a country's economy as of a particular time. Also referred to as money stock, money supply includes safe assets, such as cash, coins, and balances held in checking

and [savings accounts](#) that businesses and individuals can use to make payments or hold as short-term investments.

Conclusively, it is hoped that this research explains the impact of foreign exchange rate on performance of manufacturing sector in Nigeria.

1.2 Statement of the Problem

In any developing country like Nigeria, foreign exchange policy is an important policy instrument. Up to the time of (SAP), it appeared that Nigerian's exchange rate policy tends to encourage over-valuation of the Naira. This, in turn, encouraged imports, and discourages non-oil export and over dependence on imported inputs. Exchange rate policy was not geared towards the attainment of long-run equilibrium rate that would equilibrate the balance of payment in the medium and long-term and facilitate the achievements of certain structural adjustment objectives e.g. export diversification. The problems of the Nigerian economy however is seen as failures of the manufacturing sector characterized by low level of foreign investment in manufacturing, low capacity utilization, low value added, high production cost, absence of a sound technological base, poor returns, low contribution to Gross Domestic Product. The performance of the manufacturing sector since 1986 has been poorly attributed to macroeconomic instability and inconsistency in the exchange rate. The manufacturing sector is weak and heavily import dependent. The source of concern comes from the structure of our manufacturing sector. It is in the light of the foregoing that this study seeks to examine the impact of foreign exchange rate on the manufacturing sector performance in Nigeria.

1.3 Research Questions

The study answers the following questions:

- i. To what extent does real effective exchange rate (REER) affect return on equity (ROE) of manufacturing firms in Nigeria?
- ii. To what extent does parallel exchange rate (PER) affect return on equity (ROE) of manufacturing firms in Nigeria?
- iii. What is the effect of interest rate (INTR) on return on equity (ROE) of manufacturing firms in Nigeria?
- iv. Is there any relationship between inflation rate (INFR) and return on equity (ROE) of manufacturing firms in Nigeria?
- v. What is the effect of money supply (MSP) on return on equity (ROE) of manufacturing firms in Nigeria?

1.4 Objectives of the Study

The study ascertains the impact of foreign exchange rate on performance of manufacturing sector in Nigeria. The intended specific objectives are to:

- i. Examine the relationship between real effective exchange rate (REER) and return on equity (ROE) of manufacturing firms in Nigeria.
- ii. Ascertain the relationship between parallel exchange rate (PER) and return on equity (ROE) of manufacturing firms in Nigeria.
- iii. Determine the relationship between interest rate (INTR) and return on equity (ROE) of manufacturing firms in Nigeria.
- iv. Evaluate the relationship between inflation rate (INFR) and return on equity (ROE) of manufacturing firms in Nigeria.

- v. Ascertain the relationship between money supply (MSP) and return on equity (ROE) of manufacturing firms in Nigeria.

1.5 Statement of Hypotheses

Ho₁: There is no significant relationship between real effective exchange rate (REER) and return on equity (ROE) of manufacturing firms in Nigeria.

Ho₂: There is no significant relationship between parallel exchange rate (PER) and return on equity (ROE) of manufacturing firms in Nigeria.

Ho₃: Interest rate (INTR) does not have any significant impact on return on equity (ROE) of manufacturing firms in Nigeria.

Ho₄: Inflation rate (INFR) does not have any significant impact on return on equity (ROE) of manufacturing firms in Nigeria.

Ho₅: There is no significant relationship between money supply (MSP) and return on equity (ROE) of manufacturing firms in Nigeria.

1.6 Scope of the Study

This research focuses on the impact of foreign exchange rate on manufacturing sector performance in Nigeria. The time frame for the research is twenty-seven years (1990 – 2016). The study used secondary data (time series data), for fifteen (15) manufacturing firms quoted in the Nigeria stock exchange. The study covers all manufacturing classifications of productivity sector such as industrial sector and consumer goods, they are: Flour Mills Nigeria Plc (Lagos State), Dangote Cement Plc. (Lagos State), Berger Paints Plc. (Lagos State), Beta Glass Plc. (Lagos State), Premier Paints Plc. (Ogun State), Cutix Plc. (Anambra State), Portland Paints & Products Nigeria Plc.

(Lagos State), Meyer Plc. (Lagos State), Honeywell Flour Mill Plc. (Lagos), 7-UP Bottling Company (Lagos), Cadbury Nigeria Plc. (Lagos), Guinness Nigeria Plc. (Lagos), Nestle Nigeria Plc. (Lagos), Golden Guinea Brewery Plc. (Lagos), and VitaFoam Nigeria Plc. (Lagos). The source of data included all annual reports and statement of accounts of the fifteen (15) manufacturing firms.

1.7 Significance of the Study

To recommend more sophisticated method of managing and controlling foreign exchange rate that would guarantee optimum level of profitability in manufacturing firms in Nigeria.

This work would also serve as a base to other researchers who tend to quest for more understanding on the topic under study.

This study will be useful to investors in order to serve as a guide on investment decisions.

It will enable individuals and the general public to know if positive or negative influence exists between foreign exchange rate and manufacturing sector in Nigeria.

1.8 Limitations of the Study

- i. Attitudinal behavior of the staff of most of the manufacturing firms in releasing their annual reports, the researcher made attempt to get the relevant annual report from the internet of which much data will be needed but limited financial resources hindered full download of the relevant annual report.
- ii. Unfriendly behavior of staff of Nigeria stock exchange to release the number of manufacturing firms quoted.

- iii. **Transportation Challenge:** The researcher has to move to the different manufacturing firms under study in order to obtain annual report and also transport to Nigeria stock exchange office, but insufficient fund at hand hindered such movement effectively.

All these limitations did not negatively affect the findings and the data available for this study is sufficient to achieve the desired result.

1.9 Definition of Major Terms

1. **Exchange Rate:** In [finance](#), an exchange rate (also known as the foreign-exchange rate, forex rate or FX rate) between two [currencies](#) is the rate at which one currency will be exchanged for another. It is also regarded as the value of one country's currency in terms of another currency.
2. **Real effective exchange rate:** This is the weighted average of a country's currency relative to an index of other major currencies, adjusted for the effects of inflation.
3. **Parallel exchange rate:** It is the rate at which one currency is exchanged for another.
4. **Inflation:** Inflation is a rise in the general [level of prices](#) of goods and services in an economy over a period of time. When the general price level rises, each unit of currency buys fewer goods and services. Consequently, inflation also reflects erosion in the [purchasing power](#) of money, a loss of real value in the internal medium of exchange and unit of account in the economy.
5. **Interest Rate:** An interest rate is the rate at which [interest](#) is paid by a borrower for the use of money that they borrow from a [lender](#).
6. **Money supply:** Is the entire stock of currency and other liquid instruments circulating in a country's economy as of a particular time. Also referred to as money stock, money supply includes safe assets, such as cash, coins, and balances held in checking and [savings](#)

[accounts](#) that businesses and individuals can use to make payments or hold as short-term investments.

7. **Performance:** The accomplishment of a given task measured against preset known standards of accuracy, completeness, cost and speed.

1.10 Organization of the Study

This study is organized into five different chapters. The current chapter has provided a comprehensive background to the study, research problem, research question, research hypotheses, etc. Other section of this study was organized as follows.

The second chapter (i.e. literature review) was organized into five sections, including a brief introduction to the current status of the study, a conceptual framework; a theoretical framework; and an empirical framework, contribution to knowledge.

The third chapter (i.e. research methodology) was organized into an introduction, and statements on the research design to be employed in the study, the population and sample size to be studied, the sampling technique with which the study sample is to be drawn, and the technique to be used for data collection and analysis.

The fourth chapter (i.e. results and discussions) was organized into introduction, data presentation, data analysis, test of hypotheses already formulated, and a summary of the research findings.

The last chapter of this study include summary, conclusion and recommendations.

1.11 Summary

Following the fluctuation of the Naira in 1986, a policy induced by the Structural Adjustment Programme (SAP), the subject of exchange rate fluctuations has become a topical issue in Nigeria.

This is because it is the goal of every economy to have a stable rate of exchange with its trading

partners. In Nigeria, this goal was not realized inspite of the fact that the country embarked on devaluation to promote export and stabilize the rate of exchange. The failure to realize this goal subjected the Nigerian manufacturing sector to the challenge of a constantly fluctuating exchange rate. This was not only necessitated by the devaluation of the naira but the weak and narrow productive base of the sector and the rising import bills also strengthened it.

CHAPTER TWO

LITERATURE REVIEW

2.1 Conceptual Framework

2.1.1 An Overview of Manufacturing Sector Performance in Nigeria

Manufacturing activities have significant impact on the economy of a nation as their contributions which account for a substantial proportion of total economic activities play a crucial role in the development process of any economy. In 2008, Nigeria manufacturing accounted for 4.13% of the Gross Domestic Product (GDP) down from 11.05% in 1980.

In terms of employment generation, manufacturing activities accounted for about 12% of the labour force in the formal sector of the nation's economy but aggregately, accounted for about 6.77% of the labour force in year 2008. Before independence, Nigeria with its large population notwithstanding had very little industrial development; a few tanneries and oil crushing mills that processed raw materials for export. During the 1950's and 1960's, a few factories including the first textile mills and food-processing plants, opened to serve Nigerians. During the 1970's and early 1980's industrial production increased rapidly, principally in Lagos, Kaduna, Kano and Port Harcourt. Factories also appeared in smaller, peripheral cities such as Calabar, Bauchi, Katsina, Akure and Jebba due largely to government policies encouraging decentralization.

Nigeria's major manufactures food and beverages, cigarettes, textiles and clothing, soaps and detergents, footwear, wood products, motor vehicles, chemical products and metals. Smaller scale manufacturing businesses engage in weaving, leather making, potteiy making and woodcarving.

The smaller industries are often organized in craft guilds involving particular families who pass skills from generation to generation. In an attempt to broaden Nigeria's industrial base, the government invested heavily in joint ventures with private companies, since the early 1980's. The

largest such project is the integrated steel complex at Ajaokuta, built in 1983 at a cost of \$4 billion. The government has also invested heavily in petroleum refining, petrochemicals fertilizers and equipment for assembling automobiles and farm equipment. In terms of the manufactured goods used within the Nigerian economy, it is of interest to examine the level of indigenous production as oppose to the imported manufactured goods as this shows the pattern of employment in the country. In Nigeria from independence to date, importation has been on the increase in which export has not for 1 year catch up with the level of import. Nigeria has aspired equilibrium in trade balance in the past by designing different forms of trade and exchange rate policies.

A number of reform measures have been carried out by successive government, however the extent to which these policies have been effective in promoting non-oil export has remained unascertained. This is because despite government efforts, the growth performance of Nigeria's non-oil export has been very slow. Generally speaking, manufacturing is underdeveloped in Nigeria. Much of the nation's modern industrial activity involves the processing of raw materials; processed foods which are largely consumed by Nigeria's expanding urban populations while raw materials such as minerals, petroleum and timber are processed almost entirely for export. The bulk of the rest of Nigeria's manufacturing output consists of consumer goods such as textiles, footwear beverages and soap which are largely sold and used within the country rather than being exported. The technology used in manufacturing ranges from rudimentary tools used in small-scale cottage industries to large-scale factories. Although, its impact on the national economy is frequently underestimated, the cottage industry sector of the economy produces significant amounts of goods both for local consumption and for the tourist trade.

Textile and footwear plants on the other hand can be sizable, often requiring modern machinery. Heavy industry such as the production of metal cars, motorcycles, bicycles and

household appliances is limited in Nigeria. Nigeria manufacturing grew in the 1960's and 1970's as the real manufacturing output rose from N114 million in 1960 and N15634 million in 1982 but declined in the 1980's and 1990's as it dropped from N15634 million in 1982 and N14935 million in 2001.

After this period of fall in output, real manufacturing output started rising as it moved from N16431 million in 2002 and N27905 million in 2008. The reflection of this is shown in Table 1 as manufacturing real output contributed 6.98% to total output but decline in its contribution during both SAP and post SAP periods to 5.78 and 4.23%, respectively.

In terms of employment generation, manufacturing contributes mean value of 12% to total employment in the pre SAP period increased to 13.45% during the SAP period but later decline to 10.06% during the post SAP period. Talking about the employment growth experienced, the pre SAP period is characterised with a mean growth of 2.6% year⁻¹ while the SAP period experienced a declining growth of 0.9% and the post reform period is characterised with a fall of 3.94%. Referring to its export growth performance more volatility is observed than real output and employment. It increased from a mean growth of 20.74% year during pre SAP to 121.95% during the post SAP reform period. In terms of its aggregate contribution to export, it is of little importance as the economy till today solely depends on oil as its major source of income (Annual budgets are prepared in Nigeria based on the present and projected price of crude oil).

After the dominance of agriculture in the early 1960, Nigeria's economic progress continued to be dominated by the remarkable oil boom. Oil revenue rose from 4.4 million in 1960 to 489 million in 1971 when it accounted for 73% of export earnings and to \$6.1 billion in 2008. In order to mitigate the problems facing the manufacturing industry in Nigeria, various measures have been put in place. Beginning from the period of independence, Imports Substitution Industrialisation

(ISI) strategy was pursued as a means of transforming the real sector, particularly the industrial sector. This strategy requires that some goods that hitherto being imported be produced locally. This is to make the economy to be self-reliant thereby, reduce vulnerability of the economy to negative external shocks and promote balance of payments viability. This strategy was also aimed at promoting activities in the manufacturing sector with the intention that it will have backward linkages with the agricultural sector in terms of input sourcing and forward linkage with the external sector in terms of promoting export of manufactured goods (Egwaikhide, 2016). Among other objectives of the strategy were to promote small and medium scale industries and persuasion for consuming locally produced goods and services.

To make the strategy work effectively, import was discouraged throughout the period covered by the strategy. In 1972 and 1977, the government of Nigeria implemented another strategy to promote indigenous and private participation in the manufacturing sector through the Nigerian Enterprises Promotion Decree (Indigenisation Decree). These strategies are characterised with the reservation of certain activities exclusively for Nigerians and specified others in which indigenous ownership can be a minimum of 40%. The government provided incentives such as tax holidays, high rate of protection (through tariffs and non-tariff barriers) etc., with a view to inducing foreigners to invest in real sector activities.

In 1986, Nigerian government adopted the Structural Adjustment Programme (SAP) against the conditions of persistence macroeconomic crises in the mid 1980's. SAP was an economic reform programme which contains macroeconomic adjustment and stabilisation measures such as trade liberalisation, currency devaluation, etc. The post-SAP reform period features mixed trade policy stance while the promotion of export continues some controls were exercised on imports. Against

the upward trend of the parallel market premium, foreign exchange market witnessed various reforms in terms of determination of the official exchange rate.

2.1.2 An Overview of Foreign Exchange Rate Policy in Nigeria

An international exchange rate, also known as a foreign exchange (FX) rate, is the price of one country's currency in terms of another country's currency. Foreign exchange rates are relative and are expressed as the value of one currency compared to another. When selling products internationally, the exchange rate for the two trading countries' currencies is an important factor. Foreign exchange rates, in fact, are one of the most important determinants of a country's relative level of economic health, ranking just after interest rates and inflation. Exchange rates play a vital role in a country's level of trade, which is critical to most every free market economy in the world. Consequently, exchange rates are among the most watched, analyzed, and manipulated economic measures, (Faff, Raboert, and Andrew Marshall, 2015).

The Nigerian exchange rate policy could be perceived from two major different periods since its political independence in (1960). These are the Pre-Structure Adjustment Programme (SAP) and the Post-Structure Adjustment Programme (SAP), respectively, they are discussed below:

i. The Pre-SAP (1960-86) Period

Certainly, there were a lot of shifts within the Nigeria foreign exchange rate policy during the 1960/85 period. Nonetheless, the monetary authorities maintained overvalued exchange rates, probably to maintain a relatively low cost of imports, particularly at the initial stages of the post-independence era. As time went on, there was policy shift in favour of gradual depreciation of the naira particularly, under the adoption of the import substitution model development in Nigeria.

Incidentally, within the 1973/76 period when the need to douse the inflationary pressures arose from the monetization of the windfall gains from the crude oil boom period, monetary authorities deliberately kept the naira at an overvalued rate.

However, at the wake of weak balance of payments position in 1977, a gradual depreciation of the naira became resorted to. Whatever the shifts, it is important to note that the determination of naira exchange rate within the pre-SAP period was achieved, pegging the local currency to a single intervention currency, and later to a basket of currencies. The naira overvaluation had its telling implications on the economy. Such implications include, making imports cheaper relative to domestic substitutes and exports relatively expensive and uncompetitive culminating in the encouragement of the importation of various items on a large scale at the expense of discouraged exports. It also encouraged capital flight and made for the dependence of the manufacturing sector on imported inputs. In recognition of these implications, the overvalued local currency became propped up by a pervasive system of exchange control which was not easy to administer while breeding various corrupt practices which undermined its usefulness.

ii. The SAP and Post - SAP Period

Against the background given in the foregoing section, a floating exchange rate regime under a deregulated foreign exchange market was proposed in the SAP document of 1986. Within this process a Second-tier Foreign Exchange Market (SFEM) was introduced on the 26th of September, 1986. The SFEM was expected to evolve an effective mechanism for exchange rate determination and allocation of foreign exchange in order to guarantee short –term stability and long-term balance of payments equilibrium SFEM started off as a dual exchange rate system which produced official first tier exchange rate and the SFEM or the “free” market exchange rate. Under SFEM, authorized dealers would bid for foreign exchange whose exchange rate would be determined by

averaging the successful bid rates. There was actually the merger of the first and second tier foreign exchange markets in July 1987 at the rate of N3.74:\$1.00. Some analysts however described this as forced (Obadan, 2016). A unified exchange rate system that emerged then was referred to as the foreign Exchange Market (FEM). In order to achieve the objectives of exchange rate policy, various modifications have been made on the institutional framework and management strategies such that SFEM later metamorphosed from FEM, later into the Autonomous Foreign Exchange Market (AFEM), Inter-Bank Foreign Exchange Market (IFEM), the Dutch Auction System (DAS) and currently the Wholesale Dutch Auction System (WDAS). The Inter-bank Foreign Exchange Market became operational in January, 1989, to unify the rates in the official and autonomous market to the reduction of the distortions inherent in the old system and was couched under daily auctions. The exchange was determined relying on any or a combination of the following options: weighted average of all quotations submitted by the banks; simple average of all quotations submitted by the banks; the highest and lowest banks' quotations, provided that the latter does not depreciate by more than 2% when compared with the rate that emerges above; intelligence reports on exchange rate movements during the previous day both in the inter-bank and in some world financial centres. For the correction of the noticeable deficiencies in the IFEM, the DAS was re-introduced in 1990. However, in order to stabilize the exchange rate, the implementation of complementary demand-management measures was an additional policy measure introduced. These arrangements and re-arrangements are done within the FEM paradigm to provide institutional framework for the determination of a realistic exchange rate in Nigeria relying on the interplay of market forces of supply and demand. A critical review of the performance of the exchange rate under IFEM shows that, there was sharp depreciation of the rate initially in January, 2000; and thereafter it became relatively stable. Thus, the naira exchanged at the rate of

N102.10: \$1 in 2000, depreciated to N111.96: \$1 in 2001. By 2002, DAS was re-introduced again and then, it aimed at the achievement of a rate that would not erode the measures of the competitiveness in the economy. This has served to stabilize the naira exchange rate. As at 2002 and 2004, the exchange rate moved to N121.0: US: \$1.00 and N133.5: US\$1.00 respectively.

It is noteworthy however that since 2005, the exchange rates has featured some notable appreciation and stability. This development can be related to the increases in oil prices in the international market which culminated into drastic increase in the foreign exchange earnings of the country.

2.1.3 Determinants of Nigeria's Foreign Exchange Rate Volatility

Exchange rate movements and exchange rate uncertainty are important determinants of international transactions. In Nigeria, these fluctuations according to Omojimito and Akpokodje (2014) have been influenced by changing pattern of international trade, institutional changes in the economy and structural shifts in production. Furthering, Ogunleye (2014) noted that the real exchange rate in Nigeria has been principally influenced by external shocks resulting from the vagaries of world price of agricultural commodities and oil price, both major sources of Nigerian export and foreign exchange earnings; contending that when the economy depended on agricultural exports, real exchange rate volatility was less pronounced given the fact that these products were subject to less volatility and that there were more trading partners' currencies involved in the calculation of the country's real exchange rate. This to him minimally affected the real exchange rate fluctuating by only 0.14 % between 1970 and 1977. The increased dependence of the country on oil, resulted in severe trade shocks from global oil price stocks fluctuating the naira exchange rate by 10% between 1978-1985 (Ogunleye, 2014). To Iyoha and Oriakhi (2012), movements in real exchange rate during this period were nominal shocks resulting from fiscal deficits.

Collaborating, Ogunleye (2014) noted that the oil windfall resulted in excessive fiscal expenditure in ambitious development projects; and when the windfall ended, the government resorted to financing its expenditures through money creation. This expansionary monetary fiscal policy according to him exerted upward pressure on inflation, aggravating sharp movements in real exchange rate movements.

From 1986, the adoption of the structural adjustment program (SAP) became a contributory factor in shaping the dynamics of real exchange rate in Nigeria. One of the cardinal points of this policy was floating nominal exchange rate policy. As the naira was allowed to float, the nominal exchange rate movement became more pronounced, contributing to stronger movements in exchange rate during this period.

Between 1986 and 1992, Ogunleye (2014) observed that the mean annual change in real exchange rate in the country increased to 25% reducing to 4.5% between 2000 and 2006. Favourable terms of trade, less fiscal dominance, effective monetary policy induced by more independent and transparent central bank and well managed nominal exchange rate policy contributed to this decline in foreign exchange rate volatility.

2.1.4 Effect of Exchange Rate Fluctuations on Export

Fluctuations, positive or negative, are not desirable to producers of export products as it has been found to increase risk and uncertainty international transactions which according to Adubi and Okunmadewa (2013) discourage trade. Findings by the International Monetary fund (2016) reveal that these fluctuations induce undesirable macroeconomic phenomena inflation; though Caballero and Carba (2013) observed positive effect of exchange rate fluctuations on export trade in European Union countries. Viewing the effect of these fluctuations from first from

its impact on foreign direct investment, Walsh and Yu (2014) noted that low exchange rate favour the importation of production machinery, and production and export in periods of high foreign exchange rate. Furthering, Foot and Stein (2015) found a strong evidence of a weak host country currency increase inward foreign direct investment within an imperfect capital market model as depreciation (down change in exchange rate) makes a host country less expensive than export destination countries. Making a firm-specific-asset analysis argument, Blonigen (2015) argued that exchange rate depreciation in host countries tend to increase foreign direct investment inflows; adding that a strong real exchange rate strengthens the incentives of foreign companies to produce at home for export instead of investing in a host country for export.

To Lama and Medina (2014), different open economies experience different episodes of exchange rate appreciation in response to different types of shocks, contending that an appreciation in exchange rate induces a contraction of the exporting manufacturing sector. Maintenance of export performance to them require the depreciation of the real exchange rate of a country's currency, the achievable through monetary injections; noting that a policy of exchange rate depreciation can successfully prevent a contraction of export output, having an allocative effect in the economy.

Adubi and Okunmadewa (2013) posited that Nigeria, a developing nation, is expected to gain from export conversion price increase as a result of currency devaluation. Findings by Obadan (2016) and Osuntogun, Edordu, and Oramah. (2015) on the effect of stable exchange on export performance showed that exchange rate affect a country's export performance; adding that instability in an exchange rate with its attendant risk affect export earnings, performance and growth: positive to exporters when devalued.

Poor results from the floating exchange regimes of the 1970's necessitated a change in foreign exchange rate management. The structural adjustment program was introduced in 1986 with the

cardinal objective of restructuring the production base of the economy with a positive bias for agricultural export production. This reform facilitated the continued devaluation of the Nigerian naira with the expected increase in domestic prices of agricultural export boosting domestic production.

2.1.5 Manufacturing Sector Export in Nigeria

Non-oil export performance was poor from 1980-1984. Nigeria's total non-oil export resulted in a net inflow of foreign exchange totaling N362.1million (in naira value) in 1984. This contrasted with the net inflows of N244.8 million in 1983 and N1.398billion in 1982. Export performance maintained a fairly stable growth rate of 19% to 1989, reducing sharply to 5% annual growth rate to N21.8765billion in 1993; with a 5% decline in 1994. Nigeria's export trade is dominated by oil exports accounting for 95% of her export value. Notwithstanding, improvements have been recorded in the non-oil exports.

From non-oil export value of N23, 096.1m in 1995, contributions from this sector of the economy increased to N95.09 billion (unadjusted) at the end 2003.

Export items from Nigeria, as in the world over, are measured using the Standard International Trade Classification (SITC) of the quantities and values of goods moved out of the country. It classifies export goods into 10 main groupings with codes 0-9. These are: 0-Food and live animals; 1- beverage and tobacco; 2-crude materials, inedible; 3-mineral fuel; 4-animal and vegetable oil; 5- chemicals; 6-manufactured goods; 7-machinery and transport equipment; 8-miscellaneous manufactured articles and; 9-Miscellaneous transactions unclassified.

Nigeria according to the Central Bank of Nigeria (2016) has recorded consistently surpluses in its trade balance. However, this has fluctuated widely along with petroleum export earnings. The

balance in services and income, on the other hand, has consistently been in deficit, reflecting Nigeria's position as a net importer of services. The current account deficit was reduced from US\$ 5.1 Billion in 2002 to US \$1.6 Billion in 2003.

Exports are pivotal to Nigeria's development prospects, as they have been a major driver of economic growth, employment, and government revenue, and carry potential for poverty reduction.

Since 1999, merchandise exports have accounted for between 34% and 52% of GDP; its share was 47.6% in 2003. Nigeria's exports are dominated by crude oil and natural gas. Together, these two commodities have accounted for between 95% and 99% of total merchandise exports (WTO 2015), thus rendering export performance heavily susceptible to the vagaries of the international oil market. In 2003, Nigeria was the third largest oil exporter amongst the members of the organization of the petroleum exporting countries (OPEC), and the fifth largest in the world (OPEC 2004; quoted by WTO 2015). Her oil earnings increased from US\$17.7 billion in 2002 to US \$27.4 billion in 2003 on account of the increased in its OPEC quota and in international oil market prices. Exports of natural gas rose significantly from US \$27 million in 1999 to US \$1.7 billion in 2003, contributing to the diversification of Nigerian exports. This could be attributable to Nigerian government effort to reduce the level of gas flaring associated with oil production, as well as measures to encourage the exploitation of Nigeria's huge natural gas resource, largely untapped until recently.

Non-oil exports, although relatively small, contribute to export diversification and serve as a channel for poverty reduction. Non petroleum exports comprise agricultural products such as palm nuts and kernels, sesame seeds, cocoa beans; and some manufactured products including chemicals, corrugated asbestos sheets, machinery and transport equipment. The growth in this

export category is inhibited by uncertainties in world commodity prices, unstable domestic macro-economic environment, supply side constraint (high cost of finance and infrastructural facilities) and other factors affecting the competitiveness of her exports. In the face of these impediments, the value of exports of products in this category increased from US\$ 21.1 Million in 1999 to US\$ 735.1 Million in 2003; maintaining a 10% annual growth rate to 2005.

These exports are distributed across a large number of countries, but most were to industrialized countries. In 2003, 72% of merchandise exports were to industrialized countries, of which the United States accounted for 40% (mostly under the African growth and opportunity Act).

Exports to the European Union improved largely due to Cotonou agreement. Exports to African and Asian Countries accounted for 10% and 11% of total merchandise export respectively.

Exports in services have been insignificant. These performances have not met the export policy expectations of the Nigerian government. Production for exports and local consumption stood at 45% of production capacity in 2005, compared to 53.0% in the NEEDS document. Non-oil income in 2005 stood at N95.092 billion compared to N19.492 billion in 1999. Export growth rate was 7.51% compared to target of 10%. Growth in non-oil earning target was 5.0% and actual was 3.2% for 2003; 5% target for 2004 and actual was 3.6%. Utilisation under AGOA scheme was only 40%, falling short of the 100% target; a clear proof of underutilization of favourable export policy.

Countries at comparable levels of economic development with similar export policy targets, for example the Central African Republic and Brazil, performed expectedly in response to export drive policies initiated locally and through trade agreements. Brazil recorded 26% annual growth rate in export in her agribusiness sector between 2000 and 2005 surpassing the target of 20%; while exports to developed countries grew at annual rate of 13%, also surpassing the target of 10%. The Country currently ranks first among world exporters of sugar, ethanol, beef, chicken, pork, coffee,

soy, orange juice and cotton (Veiga; 2008). Export performance of the Central African Republic showed an increase in export value from US\$ 87 million in 1997 to US \$118.7 million in 2005, a 36.4 % increase (WTO 2007).

2.1.6 The Effect of Exchange Rate Changes on Business

The results of companies that operate in more than one nation often must be "translated" from foreign currencies into U.S. dollars. Exchange rate fluctuations make financial forecasting more difficult for these companies, and also have a marked effect on unit sales, prices, and costs. For example, assume that current market conditions dictate that one U.S. dollar can be exchanged for 125 Japanese yen. In this business environment, an American auto dealer plans to import a Japanese car with a price of 2.5 million yen, which translates to a price in dollars of \$20,000. If that dealer also incurred \$2,000 in transportation costs and decided to mark up the price of the car by another \$3,000, then the vehicle would sell for \$25,000 and provide the dealer with a profit margin of 12 percent.

But if the exchange rate changed before the deal was made so that one dollar was worth 100 yen in other words, if the dollar weakened or depreciated compared to the yen—it would have a dramatic effect on the business transaction. The dealer would then have to pay the Japanese manufacturer \$25,000 for the car. Adding in the same costs and mark up, the dealer would have to sell the car for \$30,000, yet would only receive a 10 percent profit margin. The dealer would either have to negotiate a lower price from the Japanese manufacturer or cut his profit margin further to be able to sell the vehicle.

Under this FX scenario, the price of American goods would compare favorably to that of Japanese goods in both domestic and foreign markets. The opposite would be true if the dollar strengthened or appreciated against the yen, so that it would take more yen to buy one dollar. This type of exchange rate change would lower the price of foreign goods in the U.S. market and hurt the sales of U.S. goods both domestically and overseas.

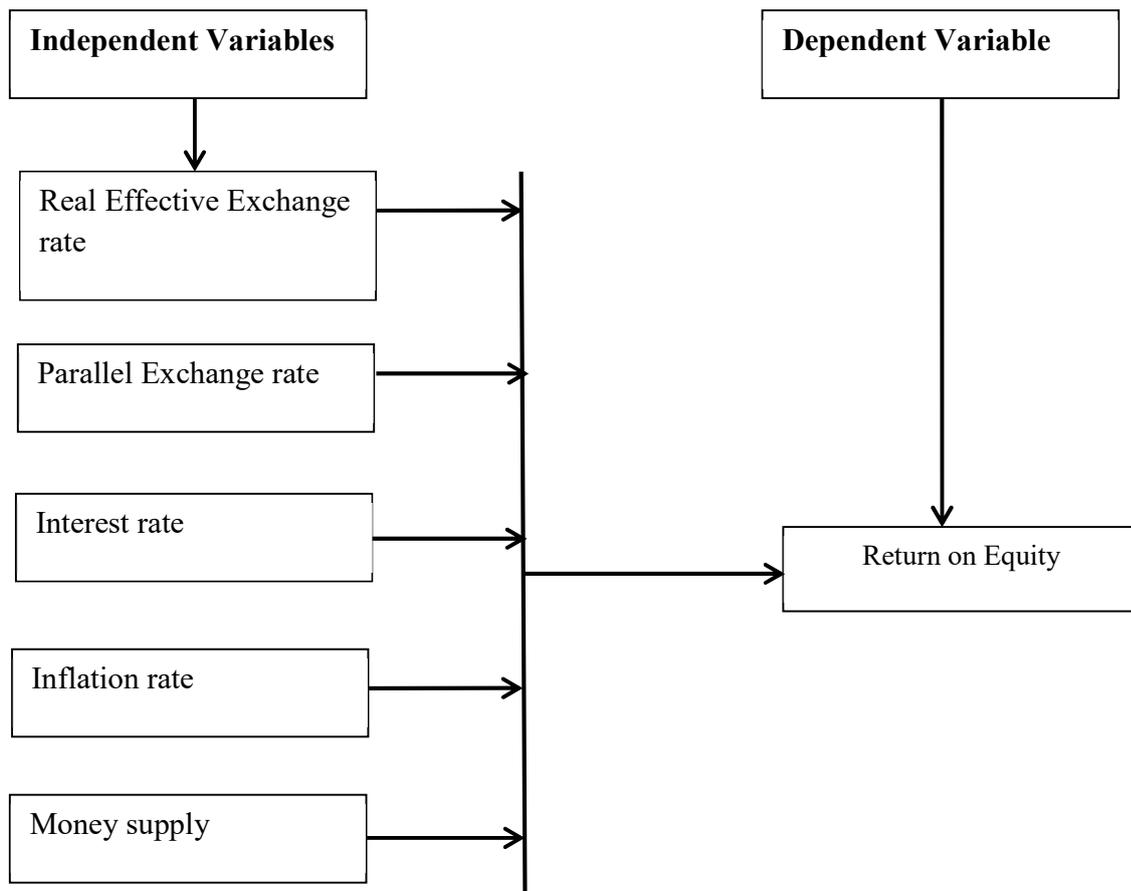


Figure 2.1: Diagrammatical Representation of Foreign Exchange Rate Variables

Source: Researchers Computation 2017

2.1.7 Exchange Rate

The exchange rate is the rate at which one currency is exchanged for another. It is the price of one currency in terms of another currency (Jhingan, 2015). Exchange rate is the price of one unit of the foreign currency in terms of the domestic currency. The debate over what determines the choice of exchange rate regimes has continued unabated over some decades now. Friedman (2013) argued that in the presence of sticky prices, floating rates would provide better insulation from foreign shocks by allowing relative prices to adjust faster. His popular support for floating exchange rate stipulates that in the long run the exchange rate system does not have significant real consequences. His reasoning is that the exchange rate system is ultimately a choice of monetary regimes. In the end, monetary policy does not matter for real quantities, but in the short run it does. While

Mundell's (2013) posits that in a world of capital mobility, optimal choice of exchange rate regime should depend on the type of shocks hitting an economy: real shocks would call for a floating exchange rate, whereas monetary shocks would call for a fixed exchange rate.

Traditionally, it has been argued that a country's optimal real exchange rate is determined by some key macroeconomic variables and that the long-run value of the optimal real exchange rate is determined by suitable (permanent) values of these macroeconomic variables (Williamson, 2014). Incidentally, since the fall of Bretton-Woods system in 1970s and the subsequent introduction of floating exchange rates, the exchange rates have in some cases become extremely volatile without any corresponding link to changes in the macroeconomic fundamentals.

This however has led to higher interest in exchange rate modeling as the question of exchange rate determination reveals to be one of the most important problems on theoretical field of monetary macroeconomics. The options available to countries for adopting a particular exchange rate regimes range from floating arrangements at one extreme to firmly fixed arrangements at the other extreme, with the remaining regimes falling on a continuum in between.

These include pegs, target zones, and fixed but adjustable rates. As exchange rate management have a defining goal of exchange rate stability, the fixed exchange rate regime and its variants are more relevant. A fixed exchange rate system is one in which exchange rates are maintained at fixed levels. Each country has its currency fixed against another currency, and it is seldom changed. For example, Nigeria maintained fixed exchange rates from the time of attainment of political independence in 1960 till the breakdown of the Bretton Woods Monetary System in the early 1970s. There are two major reasons why fixed exchange rates are appealing. They are to promote orderliness in foreign exchange markets and certainty in international transactions. Some of the variants of fixed exchange rates are as follows:

i. **Crawling Peg**

This exchange rate arrangement is a middle course between fixed and flexible exchange rates. It is appropriate for countries that have significant inflation compared with their trading partners, as has often been the case in Latin America.

Under the crawling peg, the government fixes the exchange rate on any day but over time adjusts the rate in a pre-announced fashion, taking into consideration the inflation differentials between it and its major trading partners. Essentially, the peg can be either passive, meaning that the exchange rate is altered in light of past inflation, or active, whereby the country announces in advance the exchange rate adjustments it intends to make. The advantage of this peg is that it combines the flexibility needed to accommodate different trends in inflation rates between countries while maintaining relative certainty about future exchange rates relevant to exporters and importers. The disadvantage is that the crawling peg leaves the currency open to speculative attack because the government is committed on any one day or over a period to a particular value of the exchange rate.

ii. **Adjustable Peg Exchange Rate**

This refers to the system in which a national currency is pegged to a key currency, for example, the U.S dollar, but the level of the peg could be changed occasionally, albeit within a narrow band. This exchange rate regime features a strong exchange rate commitment, and its adherents before the currency crises of the mid- and late 1990s, included Brazil, Mexico and Thailand. In these emerging market economies, where capital mobility increased steadily during the 1970s and 1980s and up to a high point in the 1990s, the authorities had difficulties in maintaining the peg (Corden, 2013). However, it is still workable for countries that have low capital mobility either because they

are not integrated with the capital markets (like some very poor countries) or because they have effective capital controls (e.g. China).

iii. **Target Zone**

This is a compromise between floating rates and fixed but adjustable rates and is a popular regime. Under it, a central rate that can be fixed, crawling or flexible is surrounded by a band within which the central rate is permitted to float. It allows for flexibility among a country's policy objectives. It is also said to prevent extreme movements in the exchange rate.

iv. **Currency Peg**

In a currency peg a local currency is pegged to an external currency, e.g., that of a dominant trading partner or to a basket of currencies, with weights reflecting the shares of the countries in foreign trade. Pegging to a single currency may yield a number of advantages, one of which is the reduction in the exchange rate fluctuations between the focus country and the country to which it is pegged. This facilitates trade and capital flows between the two countries. One major weakness of the single currency peg, however, is that where the currency is pegged to a floating currency, e.g., the dollar, the local currency will float along with the dollar *vis-à-vis* other currencies. Another disadvantage is that movements in the exchange rate in relation to the currencies of other countries may interfere with domestic macroeconomic policy objectives.

In an attempt to stabilize its effective exchange rate the developing country may peg its currency to a basket of currencies. Often this entails the weighted average of several currency values, the resulting exchange rate being total trade-weighted, export weighted or import-weighted. One major advantage of pegging to a basket is that a country may be able to avoid large fluctuations in its exchange rate with respect to several trading partners' currencies. Consequently, it is able to

stabilize its nominal effective exchange rate. Another advantage is that the system results in the reduction of price instability which arises from exchange rate changes.

However, one major disadvantage of the basket peg is the determination of the exchange rate without reference to the domestic policies of the pegging authorities. Another is that a basket-weighted exchange rate, which, by definition, moves against all major currencies, might reduce confidence on the part of foreign investors and reduce capital inflows.

2.1.8 Real Effective Exchange Rate (REER)

Real Effective Exchange Rate (REER) is a measure of the trade-weighted average exchange rate of a currency against a basket of currencies after adjusting for inflation differentials with regard to the countries concerned and expressed as an index number relative to a base year.

The nominal effective exchange rate (a measure of the value of a currency against a weighted average of several foreign currencies) is measured with nominal parts, i.e. without taking into consideration the differences between the purchasing power of the two currencies, whereas the real effective exchange rate includes price indices and their trends. The REER is NEER with price or labour cost inflation removed from it. A comparison of the REER of a number of countries can show which ones have gained and which ones have lost some of their international competitiveness.

REER is also seen as the average of the bilateral Real Exchange Rates (RER) between the country and each of its trading partners, weighted by the respective trade shares of each partner. Being an average, the REER of a country can be said to be in equilibrium if it is found overvalued in relation to one or more trading partners whilst also being undervalued to the others.

Real Effective Exchange Rates are used for an array of purposes such as assessing the equilibrium value of a currency, the change in price or cost competitiveness, the drivers of trade flows, or

incentives for reallocation production between the tradable and the non-tradable sectors. Due to the significance of the REER in economic research and policy analysis, multiple institutions including well-known bodies like the World Bank, the Eurostat, the Bank for International Settlements (BIS), the OCED, Bruegel and others publish various REER indicators for free public access. All these institutes combined publish data for 113 countries that contain all advanced and several emerging and developing countries. However, different databases have different methodologies, and even the 109 countries included in the World Bank database miss plenty of countries of the world.

2.1.9 Interest Rate

Interest rate is the amount charged, expressed as a percentage of [principal](#), by a [lender](#) to a borrower for the use of [assets](#). Interest rates are typically noted on an [annual basis](#), known as the [annual percentage rate](#) (APR). The assets borrowed could include, cash, [consumer goods](#), large assets, such as a vehicle or building. Interest is essentially a rental, or leasing charge to the borrower, for the asset's use. In the case of a large asset, like a vehicle or building, the interest rate is sometimes known as the "lease rate". When the borrower is a low-[risk](#) party, they will usually be charged a low interest rate; if the borrower is considered high risk, the interest rate that they are charged will be higher.

In the past two centuries, interest rates have been variously set either by national governments or central banks. For example, the Federal Reserve [federal funds rate](#) in the United States has varied between about 0.25% to 19% from 1954 to 2008, while the [Bank of England](#) base rate varied between 0.5% and 15% from 1989 to 2009, and Germany experienced rates close to 90% in the 1920s down to about 2% in the 2000s, [Mankiw](#), (2012). During an attempt to tackle spiraling

hyperinflation in 2007, the Central Bank of Zimbabwe increased interest rates for borrowing to 800%, (worldeconomice.co.uk, 2012).

The [interest rates on prime credits](#) in the late 1970s and early 1980s were far higher than had been recorded – higher than previous US peaks since 1800, than British peaks since 1700, or than Dutch peaks since 1600; since modern capital markets came into existence, there have never been such high long-term rates as in this period.

Possibly before modern capital markets, there have been some accounts that savings deposits could achieve an annual return of at least 25% and up to as high as 50%. (William Ellis and Richard Dawes, Lessons on the Phenomenon of Industrial Life

Reasons for interest rate changes

- i. **Political short-term gain:** Lowering interest rates can give the economy a short-run boost. Under normal conditions, most economists think a cut in interest rates will only give a short term gain in economic activity that will soon be offset by inflation. The quick boost can influence elections. Most economists advocate independent central banks to limit the influence of politics on interest rates.
- ii. **Deferred consumption:** When money is loaned the lender delays spending the money on [consumption](#) goods. Since according to [time preference](#) theory people prefer goods now to goods later, in a free market there will be a positive interest rate.
- iii. **Inflationary expectations:** Most economies generally exhibit [inflation](#), meaning a given amount of money buys fewer goods in the future than it will now. The borrower needs to compensate the lender for this.

- iv. **Alternative investments:** The lender has a choice between using his money in different investments. If he chooses one, he forgoes the returns from all the others. Different investments effectively compete for funds.
- v. **Risks of investment:** There is always a risk that the borrower will go [bankrupt](#), abscond, die, or otherwise [default](#) on the loan. This means that a lender generally charges a [risk premium](#) to ensure that, across his investments, he is compensated for those that fail.
- vi. **Liquidity preference:** People prefer to have their resources available in a form that can immediately be exchanged, rather than a form that takes time to realize.
- vii. **Taxes:** Because some of the gains from interest may be subject to taxes, the lender may insist on a higher rate to make up for this loss.
- viii. **Banks:** Banks can tend to change the interest rate to either slow down or speed up economy growth. This involves either raising interest rates to slow the economy down, or lowering interest rates to promote economic growth.^[14]
- ix. **Economy:** Interest rates can fluctuate according to the status of the economy. It will generally be found that if the economy is strong then the interest rates will be high, if the economy is weak the interest rates will be low.

2.1.10 Inflation Rate

The concept of inflation has been defined as a persistence rise in the general price level of broad spectrum of goods and services in a country over a long period of time. Inflation has been intrinsically linked to money, as captured by the often heard maxim “inflation is too much money chasing too few goods”. In the view of Hamilton (2012) inflation has been widely described as an economic situation when the increase in money supply is “faster” than the new production of goods and services in the same economy. According to Piana (2012), economists usually try to

distinguish inflation from an economic phenomenon of a onetime increase in prices or when there are price increases in a narrow group of economic goods or services.

Inflation is described by Ojo (2013) and Melberg (2012) as a general and persistent increase in the prices of goods and services in an economy. Inflation rate is measured as the percentage change in the price index (consumer price index, wholesale price index, producer price index etc). In the opinion of Essien (2012) he states that the consumer price index (CPI), for instance, measures the price of a representative basket of goods and services purchased by the average consumer and calculated on the basis of periodic survey of consumer prices. Owing to the different weights the basket, changes in the price of some goods and services have impact on measured inflation with varying degrees. There are several disadvantages of the CPI as a measure of price level. First, it does not reflect goods and services bought by firms and/or government, such as machinery. Secondly, it does not reflect the change in the quality of goods which might have occurred overtime. Thirdly, changes in the price of substitutable goods are not captured. Lastly, CPI basket usually does not change often. Despite these limitations, the CPI is still the most widely used measurement of the general price level. This is because it is used for indexation purposes for many wage and salary earners (including government employees). Another measure of inflation or price movements is the GDP Deflator. This is available on an annual basis. However, it is rarely used as a measure of inflation. This is because the CPI represents the cost of living and is, therefore, more appropriate for measuring the welfare of the people. Furthermore, because CPI is available on a more frequent basis, it is useful for monetary policy purposes. In recent times, there have been three dominant schools of thought on the causes of inflation; the neo-classical/monetarists, neo-Keynesian, and structuralists. The neo-classical/monetarists opine that inflation is driven mainly by growth in quantum of money supply. However, practical experiences of the Federal Reserve in

the United States (US) have shown that this may not be entirely correct. Hamilton (2012) and Colander (2015) the US money supply growth rates increase faster than prices itself. This has been traced to the increased demand for the US dollar as a global trade currency. The neo-Keynesian attributes inflation to diminishing returns of production. This occurs when there is an increase in the velocity of money and excess of current consumption over investment. The structuralist attribute the cause of inflation to structural factors underlying characteristics of an economy (Adams, 2015). For instance, in the developing countries, particularly those with a strong underground economy, prevalent hoarding or hedging, individuals expect future prices to increase above current prices and, hence, demand for goods and services are not only transactionary, but also precautionary. This creates artificial shortages of goods and reinforces inflationary pressures. The literature is replete with those factors that could affect the level of inflation. These factors can be grouped into institutional, fiscal, monetary and balance of payments. Several studies such as Melberg (2012); Cukierman, Webb and Neyapti (2014); Grilli, et al (2014); Alesina and Summers (2012); Posen (2012); Pollard (2015); and Debelle and Fisher (2015) have shown that the level of independence (legal, administrative, and instrument) of the monetary authority is an important institutional factor determines inflation, especially, in industrialized countries, while rate of turnover of central bank governors in developing countries was seen as an important factor influencing inflation. However, caution should be exercised in the interpretation of these findings, given the difficulty in measuring the actual level of independence of a central bank. The fiscal factors relate to the financing of budget deficits, largely through money creation process. Under this view, inflation is said to be caused by large fiscal imbalances, arising from inefficient revenue collection procedures and limited development of the financial markets, which tends to increase the reliance on seigniorage as a source of deficit financing (Agenor and Hoffmaister, 2016; and

Essien, 2015). The monetary factors and demand side determinants include increases in the level of money supply in excess of domestic demand, monetization of oil receipts, interest rates, real income and exchange rate (Moser, 2015). Alesina and Summers (2013) prudent monetary management was also found to aid the reduction in the level and variability in inflation. The balance of payments or supply side factors, relate to the effects of exchange rate movements on the price level. Melberg (2012); Odusola and Akinlo (2014) and Essien (2015) opined that exchange rate devaluation or depreciation includes higher import prices, external shocks and accentuates inflationary expectations.

Inflation Targeting in Developing Economies

The hallmark of inflation targeting is the announcement by government, the central Bank, or some combination of the two that in the future the central Bank will strive to hold inflation at or near some numerically specified level. Inflation targets are more often than not specified as for example 1-3 percent, rather than single number and are typically established for multiple horizons ranging from one to four years (Bermanke & Mishkin 2013). However, Tutar (2012), reported that the centre point of inflation target is referred to as their interpretation of the operational definition of price stability. While in theory of inflation appears to be equal to price stability, in practice, the concept of price stability is influenced by some other issues like price level measurement, and nominal rigidity. The rationale for treating inflation as a primary goal of monetary policy is clearly strongest when medium –to– long term horizons are considered, as most economists agree that monetary policy can affect real quantity such as output and employment only in the short run. Of course, some economists of new classical or monetarist persuasions might claim that inflation should be the sole concern of monetary policy in the short run as well as arguing that using monetary policy in the short run stabilization of real economy is undesirable, infeasible or both.

However in practice, central bank has completely forsworn the use of monetary policy for short run stabilization, and so phraseology “primary” or “overriding” must be taken to refer to longer term. However, what appeared to be more comprehensive regarding the concept of inflation targeting was the one provided by Eichengreen (2013) where he defined inflation targeting as follows: “a monetary policy operating strategy with four elements; an institutionalized commitment to price stability as the primary goal of monetary mechanism rendering the central bank accountable for attaining its monetary policy goals; the public announcement of target inflation; and policy of communicating to the public and the markets the rationale for the decision taken by central bank”.

To state it clearly, an inflation targeting arrangement is not just about public pronouncement of an inflation target/range. Important features of an inflation target arrangement include the definition of what type of inflation is being targeted, the inflation target range, the use of exclusion clauses or caveat (for example under what circumstances the central bank is able to overshoot its target), and the target horizon. All this information needs to be publicly available and fully transparent. Also the definition provided by Mishkin (2014) captures most of the issues raised in the literature. “Inflation targeting is a monetary policy strategy that encompasses five main elements i) the public announcement of medium term numerical target of inflation; ii) an institutional commitment of price stability as the primary stability as the monetary policy, to which other goals are subordinated; iii) an information inclusive strategy in which many variables and not just monetary aggregates or the exchange are used for deciding the setting of policy instruments; iv) increased transparency of monetary policy strategy through communication with the public and markets about the plans, objectives and decisions of monetary authorities; v) increased accountability of the central bank for attaining its inflation objectives”. The above description of inflation targeting

is not totally different from others, but only the all inclusive nature of the definition and little bit of including many variables. However, Bulir (2015) used three key inflation targeting communication tools – inflation targets, inflation forecasts, and verbal assessments of inflation factors contained in quarterly inflation reports provided consistent message in five out of six countries; Chile, the Czech Republic, Hungary, Poland, Thailand and Sweden. However, no single central Bank, according to him in the sample stands out as an exceptionally good forecaster of inflation and communication of its policies.

Conceptually, inflation targeting (IT) decreases a monetary policy framework in which central banks accept and announce certain targets of inflation, over a given period of time, as measure of policy anchor and are accountable for deviation of actual from set of targets. Three main forms of inflation targeting have been identified: (I) full fledge IT (FFIT), that is, when a country is ready to adopt IT as its single nominal anchor upon which macroeconomic stability would be achieved. This is suitable for countries with robust or sound financial environment, and a central bank, which is transparent, accountable and highly committed to the attainment of the goal of IT. (ii) Electric IT (EIT) when a country, for instance pursues IT along with other monetary policy objectives in a stable financial environment which, however, is less accountable and transparent. (iii) Inflation targeting lite (ITL), low profile forms of inflation targeting pursued by countries, largely due to lack of strong or credible macroeconomic environment. ITL countries float their exchange rate and announce an inflation target, but are not able to maintain the inflation target as the foremost policy objective. A number of emerging market economies are practitioners of ITL. It is agreed also that FFIT is not possible in ITL countries because of the following;

- i. Lack of sufficiently strong fiscal position and high debt/GDP ratio.
- ii. Lack of a fully developed monetary and financial system.

- iii. Vulnerability of economic shocks (especially supply shocks) owing to their low degree of development.
- iv. Lack of transparency in the operation and implementation of monetary policy (Englama and Aliyu, 2015). In practice, all types of monetary policy involve modifying the amount of base currency (Mo) in circulation.

This process of changing the liquidity of base currency through the open sales and purchases of (government-issued) debt and credit instruments is called open market operations. Constant market transactions by the monetary authority modify the supply of currency and this impacts other variables such as short-term interest rates and exchange rate. The distinction between the various types of monetary policy lies primarily with the set of instruments and variables that are used by the monetary authority to achieve their goals.

Countries Experience with Inflation Targeting

Since the early 1990, many emerging economies switched to inflation targeting as their monetary policy regime. These countries have different economic environments and hence decided to follow a policy suitable to a specific economic. These countries are categorized into three. First countries with relatively strong financial market fundamentals, such as a stable macroeconomic environment, and independent countries moved to inflation targeting with flexible exchange with specific inflation targets to be achieved over the specified period. The second group is countries did not have the same environment and switched to inflation targeting with tolerance bands. Third group of countries had difficulty in maintaining specific target due to a less credible central bank and adopted a policy of inflation targeting lite. Chile (2012), Peru (2016), and Mexico (2014) used the “big bang” approach, while Chile followed a gradual converge towards full-fledge (Khalid 2015). Batini and Laxton (2015) compared the performance of emerging economies who adopted

an I.T regimes (IT user) and those who did not (non-I.T users) over the period of 15 years. They observed high inflation in all sampled countries in the early to mid-1990. Although, inflation tends to fall in all sampled countries, they observed higher inflation for non-IT users countries with a range of 3.5% this reflect the success of IT in emerging economies. In a study conducted by Ye, and Lin (2014) on the effect of inflation targeting in thirteen (13) developing countries, using variety of propensity score matching methods, their result shows that on the average, inflation targeting has large and significant effects of lowering both inflation and inflation variability in these thirteen countries. However, the effect of inflation targeting on lowering inflation is found to be quite heterogeneous. The performance of a given inflation regimes can be affected by country's characteristics such as government fiscal position of exchange rate, its willingness to meet the precondition of policy adoption and time length.

Also, in the context of a simple empirical model, Aizenman, Hitchison, Noy (2014) have proven using panel data for 17 emerging markets both IT and non- IT observed that a significant and stable response running from inflation to policy interest rates in emerging markets that are following publically announced IT policies. By contrast, Central Banks respond much less to inflation in non- IT regimes. They allocate for a "Mixed IT Strategy" whereby both inflation and exchange rates are important determinants of policy interest rates.

The theory regarding the determination of price level, and changes in price level is the quantity theory of money. This theory in its simplest form postulates a direct proportional relationship between money supply and price level. According to the theory if money supply were doubled, prices would increase proportionately.

Several studies after this formulation have shown that money supply is significant in explaining inflation in both advanced and developing economies. Among such studies are those of Akinifesi, Owosekun and Odama, Osakwe, Adeyokunu and Ladipo, Moser, Tanzi, Ikhide, and Aigbokhan.

2.1.11 Money Supply

According to Osiegbu, (2015) money is a dynamic instrument on the economy. It acts as an indispensable lubricant of the economic machine without which production and exchange would be limited. Money makes savings easier and simplifying lending. By the use of money, it is possible to mobilize the surpluses of other members of the public and lend them out for investments. Money in many ways speeds up the economic process. Osiegbu further gave the classification of money as (a) currency outside the banks which is currency in circulation less vault cash in banks. (b) demand deposit i.e money in the fixed deposit or current account. (c) M_1 which denotes note currency which could be used as medium of exchange. (d) M_2 which denotes M_1 plus fixed and savings account. (e) Quasi money which Osiegbu (2015) posits that it qualified as postal order, money order, treasury bills, shares, bonds etc. (f) M_3 are deposits with companies, mortgage banks, finance houses etc. M_1 and M_2 is use for money in circulation for the purpose of this study. Money is used in virtually all economic transactions, it has a powerful effect on economic activity. An increase in the supply of money works both through lowering interest rates which spurs investment and through putting more money in the hands of consumers, making them feel wealthier and thus stimulating spending. Business firms respond to increased sales by ordering more raw materials and increasing production (Afolabi, 2016). The spread of business activity increases the demand for labor and raises the demand for capital goods.

Also in a buoyant economy, stock market prices rise and firms issue equity and debt. If the money supply continues to expand and prices begin to rise, especially if output growth reaches capacity

limits. As the public begins to expect inflations, lenders insist on higher interest rates to offset on expected decline in purchasing power over the life of their loans.

Opposite effects occurs when the supply of money falls or when its rate of growth declines. Economic activity declines either disinflation (reduced inflation) or deflation (falling prices) results (Anyanwu, 2015).

2.1.12 Interest and Exchange Rates Management in Nigeria

Interest rate management refers to the totality of steps and processes designed and used by the monetary authorities (the CBN) to determine, sustain or support the level of interest rates in an economy in ways that engender the achievement of the stated macroeconomic goals of price and exchange rate stability, rapid and sustainable employment, and generating growth. Interest rate management also entails anticipating the financial markets and developing appropriate policy measures to impact the markets using known monetary tools. It needs to also ensure that rates do not fall to levels where the liquidity trap ensnares the economy. (Liquidity trap - the level of interest rate below which further reductions will not impact on the level of economic activities/national income).

Interest rate and foreign exchange rate risks are two significant economic and financial factors that affect the common stock value. Interest rate, which reflects the price of money, has an effect on other variables in money and capital markets. The interest rates indirectly affect the valuation of the stock prices and also its volatility directly creates a shift between the money market and capital market instruments. Interest rate volatility influences the valuation of the stocks by affecting the basic values of the firm, such as net interest margin, sales and etc. An increase in interest rates negatively affects the value of assets by increasing the required rate of return. Furthermore, an

increase in interest rates leads investors to change the structure of his/her investment from capital markets to fixed-term income securities market. Conversely, a decline in interest rates leads to an increase in the present value of the future dividends (Hashemzadeh and Taylor, 2014). Interest rate is considered as one of the most significant determinants of the stock prices (Modigliani and Chon, 2016).

Volatility in the foreign exchange rate is the one of the other major sources of macroeconomic uncertainty that affects the firms. After the financial liberalization and deregulation after 1970s and the adoption of the floating exchange rate regime, many countries are exposed to the foreign exchange rate volatility. Foreign exchange rate volatility influences the value of the firm since the future cash flows of the firm will change with the fluctuations in the foreign exchange rates. According to Luehrman (2013) depreciation of a currency of a country affects the competitiveness of the firms engaged in international competition by leading an increase in the demand for its export goods. Also, Adler and Dumas (2014) reported that although firms whose operations are widely domestic may be influenced by the fluctuations in the foreign exchange rates as their input and output prices may be affected by the currency movements. At the same time, if the country is import denominated, the weak currency may have a negative impact on the country due to the increase in the cost of imported goods.

Studies on the determinants of interest rates in Nigeria have been generally scanty. These include Ndekwu (2014), which examined the relationship between interest rates, bank deposit and economic growth in Nigeria; Ajakaiye and Omole (2014), which studied the impact of commercial bank lending rates on inflation in Nigeria; Ogwumike and Omole (2013), which examined the role of interest rates in domestic resource mobilization; and Omole and Falokun (2012), which examined how interest rate influences corporate financing strategy. Others include Teriba (2012),

which studied the determinant of the information content of Interest Rate Spread (IRS) in Nigeria; and Busari (2015), which examined the role of interest rates in economic activities in Nigeria; Adebisi and Babatope-Obasa (2014) which examined institutional framework, interest rate policy and the financing of the Nigerian Manufacturing sub-sector, a paper presented at the 2004 Paper Forum, Lord Charles Hotel, Somerset West, South Africa. However, in spite of all these studies, work on interest rate determination in Nigeria is an area that has not received much attention. The work of Uwatt and Onwioduokit (2016) would have been a good example of this but the study is flawed in that it covers largely the period of regulation when interest rate was administratively fixed. While work of Busari, Olayiwola and Olaniyan (2015) would also have been a good example but the study is also flawed in that it covers the period of deregulation.

This study represents an attempt to bridge the gap of regulation and deregulation.

From international perspective, Omar, (2013) studied the differential impact of real interest rates and credit availability on private investment: Evidence from Venezuela and maintained that, according to the financial liberalization theory, we should expect that in economies with very low or negative real interest rates, a positive shock to interest rates would cause a positive effect on private investment while the same effect is negative, according to the traditional theory, at higher rates. Other international studies include Patnaik and Vasudevan (2014), which studied interest rate determination (India): An Error Correction Model (ECM) and David and Folawewo studied investigation on macroeconomic and market determinants of banking sector interest rate spreads: empirical evidence from low and middle income countries with conclusion that despite the widespread implementation of costly financial sector reform programmes in the developing world, banking sectors in many developing countries are still characterized by persistently high interest rate spreads (IRS).

2.1.13 What Makes Currencies Fluctuate

A foreign exchange rate is a price or a numerical expression of value of the currency of one country in terms of that of another country at any given time. Having established the reasons why firms/banks trade in foreign exchange and the motives for the transaction, it is pertinent to review those factors which make currencies fluctuate.

Most authorities believe that currencies movement are caused by some or all of the following factors which influence the demand and supply of each currency in the market.

- i. Relative price levels and inflation rate
- ii. Relative economic growths
- iii. Relative interest rates, especially in the freely traded money market like the Euro currency market.
- iv. Relative change in the money supply in the currency areas (countries) concerned
- v. Investment or portfolio preferences of big international investors like the OPEC countries.
- vi. Bandwagon effects (if a currency seems to be on the way up, speculators may exaggerate to trend by buying in the hope of a quick profit)
- vii. Intervention by central banks
- viii. Interest rate arbitrage.

Any of the above factors can independently or in conjunction with other factors affect the value of a particular currency. It is also important to stress the various causes take different time spans to operate.

2.2 Theoretical Framework

2.2.1 Balance of Payment Theory of Exchange Rate

The balance of payments theory of exchange rate holds that the price of foreign money in terms of domestic money is determined by the free forces of demand and supply on the foreign exchange market, propounded by Bretton Woods in (1970).

It follows that the external value of a country's currency will depend upon the demand for and supply of the currency. The theory states that the forces of demand and supply are determined by various items in the balance of payments of a country.

According to the theory, a deficit in the balance of payments leads to fall or depreciation in the rate of exchange, while a surplus in the balance of payments strengthens the foreign exchange reserves, causing an appreciation in the price of home currency in terms of foreign currency. A deficit balance of payments of a country implies that demand for foreign exchange is exceeding its supply.

As a result, the price of foreign money in terms of domestic currency must rise, i.e., the exchange rate of domestic currency must fall. On the other hand, a surplus in the balance of payments of the country implies a greater demand for home currency in a foreign country than the available supply. As a result, the price of home currency in terms of foreign money rises, i.e., the rate of exchange improves.

In short, the balance of payments theory simply holds that the exchange rates are determined by the balance of payments connoting demand and supply positions of foreign exchange in the country concerned. As such, the theory is also designated as "Demand-Supply Theory."

The theory asserts that, the rate of exchange is the function of the supply of and demand for foreign money and not exclusively the function of prices obtaining between two countries as asserted by the Purchasing Power Parity Theory which does not take into account invisible items.

According to the balance of payments theory, the demand for foreign exchange arises from the "debit" items in the balance of payments, whereas, the supply of foreign exchange arises from the "credit" items. Since the theory assumes that the demand for and supply of foreign currency are determined by the position of the balance of payments, it implies that supply and demand are determined mainly by factors that are independent of variations in the rate of exchange or the monetary policy.

According to the theory, given demand-supply schedules, their intersection determines the equilibrium exchange rate of a currency. It should be noted that the lower the price of a currency, the greater will be the demand for it, and therefore, the demand curve slopes downward. On the other hand, the supply curve slopes upward from left to right indicating that a lowering of the value of price of the currency tends to contract its supply.

DD and SS are the demand and supply curves of a given country's currency. These two curves intersect at a Point P determining PM or OR as the exchange rate where the quantities demanded and supplied are equal (OM).

It is the equilibrium rate. When OR is the rate exchange (high), supply exceeds demand, hence it will be lowered by the excessive supply fore When the rate is lowered, supply will contract and the demand will expand. This process will continue till both are in equilibrium at the point of intersection. The reverse will happen when the exchange rate is lower than the equilibrium rate.

It goes without saying that changes in demand or supply or both will accordingly influence equilibrium rate of exchange. This is how the theory brings the determination of the exchanger within the purview of the general theory of value (or equilibrium analysis).

Merits of Balance of Payment Theory of Exchange Rate

The main merit of the theory is that it brings the determination of exchange rate problem within the purview of the general equilibrium analysis.

Secondly, the theory stresses the fact that, there are many predominant forces besides merchandise items (exports and imports of goods) included in the balance of payments which influence the supply of and demand for foreign exchange which in turn determine the rate of exchange. Thus, the theory is more realistic in that the domestic price of a foreign money is seen as a function of many significant variables, not just purchasing power expressing general price levels.

Furthermore, the greatest practical significance of the theory is that, it shows that disequilibrium in the balance of payments position can be corrected by marginal adjustments in the exchange rate by devaluation or revaluation rather than through internal price inflation or deflation as implied by the mint parity theory.

Criticisms of Balance of Payment Theory of Exchange Rate

1. The fundamental defect of the theory is that it assumes perfect competition, including no interference with the movement of money from one country to another. This is very unrealistic.

2. According to the theory, there is no causal connection between the rate of exchange and the internal price level. But, in fact, there should be some such connection, as the balance of payments position may be influenced by the price-cost structure of the country.

3. The theory advocates that the rate of exchange is the function of the balance of payments. But, in practice it has also been found that the balance of payments position of a country is very much affected by the changes in the rate of exchange. Thus, it is equally true that the balance of payments is the function for the rate of exchange. In this sense, the theory is indeterminate as it confuses as to what determines what.

4. According to the theory, the optimum value of a currency is the gold content embodied in it. This is not true for a fiat paper standard. Thus, the demand-supply theory fails to explain the basic value incorporated in currencies.

5. In fact, the balance of payments theory of exchange rate is merely a truism - a self-evident fact without any causal explanatory significance. Critics argue that if payments must necessarily balance, there can be no meaning to a decline in the exchange rate during an unfavourable trade balance; an uncovered balance simply does not exist.

2.2.2 Monetary Model of Foreign Exchange Rate

Dornbusch (1976) developed the monetary model in its sticky-price variant. Frenkel (1976) and Mussa (1976) introduced the monetary model with flexible prices (Smith and Wickens 1986). After that the monetary model was further developed and empirically tested by Bilson (1978),

Keran (1979), Frenkel (1976), Officer (1981), Hakkio (1982), Frankel (1982), Smith and Wickens (1986) among many others.

The flexible-price monetary model (associated with Frenkel and Mussa) assumes that prices of goods are flexible, and that purchasing power parity (PPP) always holds. The assumption about PPP implies that the real exchange rate is constant over time (Diamandis, Georgoutsos, and Kouretas, 1996).

The sticky-price monetary model (associated with Dornbusch, 1976) assumes that prices of goods are sticky in the short run, and that PPP holds only in the long run but does not hold in the short run because goods prices adjust slowly relatively to asset prices. This model “allows substantial overshooting for both the nominal and the real price-adjusted exchange rates beyond their long-run equilibrium (PPP) levels, since the exchange rates and the interest rate compensate for sluggishness in the goods prices” (Diamandis, Georgoutsos, and Kouretas, 1996).

Both models also assume stable domestic and foreign money demand functions, perfect capital mobility, and uncovered interest parity.

While the assumptions of the monetary model rarely hold in the real world (especially in the short run), this model shows theoretically well-grounded relationship between exchange rate, prices, money, real incomes, and interest rates.

The basic monetary model can be represented the following way:

$$s = (m - m^*) + \alpha_1 (y - y^*) + \alpha_2 (i - i^*) + \text{error} \quad (1)$$

where all small letters denote logarithms. Here s is nominal exchange rate, m is money supply, y denotes real income (or industrial production, or real output), i is nominal interest rate. Asterisk denotes a foreign country. Some researchers also employ difference in inflation⁴ ($\pi - \pi^*$) and difference in accumulated trade balances⁵ ($tb - tb^*$).

2.2.3 Purchasing Power Parity Theory of Exchange Rate

Macroeconomic analysis relies on several different metrics to compare economic productivity and standards of living between countries and across time. One popular metric is [purchasing power parity \(PPP\)](#).

Purchasing Power Parity (PPP) is an economic theory that compares different countries' currencies through a market “basket of goods” approach. According to this concept, two currencies are in equilibrium or at par when a market basket of goods (taking into account the exchange rate) is priced the same in both countries.

The formula is calculated thus:

$$S = \frac{P_1}{P_2}$$

Where:

"S" represents exchange rate of [currency](#) 1 to currency 2

"P₁" represents the cost of good "x" in currency 1

"P₂" represents the cost of good "x" in currency 2

To make a comparison of prices across countries that holds any type of meaning, a wide range of goods and services must be considered. The amount of data that must be collected, and the complexity of drawing comparisons makes this process difficult. To facilitate this, the International Comparisons Program (ICP) was established in 1968 by the University of Pennsylvania and the [United Nations](#). Purchasing power parities generated by the ICP are based

on a worldwide price survey that compares the prices of hundreds of various goods. This data, in turn, helps international macroeconomists come up with estimates of global productivity and growth. Every three years, [the World Bank](#) constructs and releases a report that compares various countries in terms of PPP and U.S. dollars.

Both the International Monetary Fund (IMF) and the Organization for Economic Cooperation and Development (OECD) use weights based on PPP metrics to make predictions and recommend economic policy. These actions often impact financial markets in the short run.

2.2.4 Uncovered Interest Rate Parity Theory of Exchange Rate

The uncovered interest rate parity (UIP) is a [parity](#) condition stating that the difference in interest rates between two countries is equal to the expected change in exchange rates between the countries' [currencies](#). If this parity does not exist, there is an opportunity to make a risk-free profit using arbitrage techniques.

Assuming foreign exchange equilibrium, interest rate parity implies that the expected return of a domestic asset will equal the expected return of a foreign asset once adjusted for exchange rates. There are two types of interest rate parity: covered interest rate parity and uncovered interest rate parity. When this no-arbitrage condition exists without the use of forward contracts, which are used to hedge foreign currency risk, it is called uncovered interest rate parity.

The formula for uncovered interest rate parity takes into account the following variables:

$E(t + k) / S(t)$ = the expected [rate of change](#) in the [exchange rate](#), which is simply the projected exchange rate at time $(t + k)$ divided by the spot rate at time t

k = the number of time periods into the future from time t

$i(c)$ = the foreign interest rate

$i(d)$ = the domestic interest rate.

2.2.5 Abstinance or Waiting Theory of Interest Rate

The abstinance theory was propounded by Senior, (1989). According to him, interest is a reward for abstinance. When an individual saves money out of his/her income and lends it to other individual, he/she makes sacrifice. The term sacrifice implies that the individual refrains from consuming his/her whole income that he/she could spent easily. Senior advocated that abstaining from consumption is unpleasant. Therefore, the lender must be rewarded for this. Thus, as per Senior, interest can be regarded as the reward for refraining from the use of capital.

Abstinance theory was also criticized by a number of economists. According to the theory, an individual feels unpleasant when they save as it reduces his/her consumption. However, rich people do not feel unpleasant while saving because they are able to meet their requirements.

2.2.6 Mark-up Theory of Inflation Rate

Mark-up theory of inflation was proposed by Prof Gardner Ackley. According to him, inflation cannot occur alone by demand and cost factors, but it is the cumulative effect of demand-pull and cost-push activities. Demand-pull inflation refers to the inflation that occurs due to excess of aggregate demand, which further results in the increases in price level. The increase in prices levels stimulates production, but increases demand for factors of production. Consequently, the cost and price both increases.

In some cases, wages also increase without rise in the excess demand of products. This results in fall in supply at increased level of prices as to compensate the increase in wages with the prices of products. The shortage of products in the market would result in the further increase of prices.

Therefore, Prof. Gardner has provided a model of mark-up inflation in which both the factors, demand cost, are determined. Increase in demand results in the increase of prices of products as the customers spend more on products.

On the other the goods are sold to businesses instead of customers, then the cost of production increases. As a result, the prices of products also increase. Similarly, a rise in wages results in increase in cost of production, which would further increase the prices of products.

So according to Prof Gardner, inflation occurs due to excess of demand or increases in wage rates; therefore, both monetary and fiscal policies should be used to control inflation. Though, these two policies are not adequate to control inflation.

2.2.7 The Classical School Theory of Money

For the classical argument, money is insignificant referring to finance as that which suffered obscurity in the hands of the classical economist. Money was passive and neutral as a causative factor in the economy Niebyl (1946) and Wallace (2005). The substance of the classical argument was captured by Mills (1848) who posited that there cannot in short, be intrinsically a more insignificant phenomenon in the economy of society than money.

2.2.8 The Keynesian Position Theory of Money

The incoming of the Keynesian mainstream however gave more recognition and affection to the going need of money than the classical. In the era, dominates by this school of mainstream taught,

money was ascribed some measures of importance and so was finance. The work of Keynes titled, the General theory of money is a case in point which gave impetus to the development of money. Keynes era created awareness and recognition to something more than money. According to Ezirim (2005), the sum of the Keynesian argument is that money exerts an indirect influence on the economy through the vehicle of interest rates thus money started gaining some recognition as a causative factor in the economy.

2.3 Empirical Framework

In the past, many researchers have explored the relationship between foreign exchange rate and manufacturing employment. Different methodologies employed have resulted in different results some contradictory to past evidences where some in support as the case may be. The empirical results of these studies however were ambiguous and mixed (Campa and Goldberg, 2017) therefore, a conclusive remark as not been reached. This is not surprising as output effect of exchange rates (which is expected to be highly correlated with employment) (Changes in employment are linked to changes in output via a production function) is transmitted via the trade balance and the foreign trade multiplier. Because the conclusions of the theoretical models of the trade effect of exchange rate movement are ambiguous, this abates the possibility of concluding a significant systematic relationship between the exchange rate and employment. Most of the empirical works on the subject of this study concentrated more on the disaggregated level.

The concern has mostly been with the manufacturing sub-sector where most of the work done has concentrated on a particular country. The presumed relationship in these studies is negative that is an appreciation of the currency is expected to lead to a decrease in employment and vice versa. Some empirical studies established that exchange rate fluctuations have significant negative

effect on employment (Alexandre *et al.*, 2012; Demir, 2012; Frenkel, 1976; Nucci and Pozzolo, 2014; Goldberg and Tracy, 2012; Burgess and Knetter, 2016; Revenga, 2012; Branson and Love, 2013). Some studies on the other hand, found weaker implications of exchange rates for employment but more pronounced effects for wages (Campa and Goldberg, 2017; Goldberg and Tracy, 2012). Some studies established positive relationship between exchange rate and general employment (Ngandu, 2013).

Opaluwa, Umeh and Ameh (2012) examined the impact of exchange rate fluctuations on the Nigerian manufacturing sector during a twenty (20) year period (1986 – 2005). The variables used are: $MGDP = f(MER, MFPI, EXR)$, where MGDP is manufacturing gross domestic product, MER is manufacturing employment rate, MFPI is manufacturing foreign private investment and EXR is exchange rate. The argument is that fluctuations in exchange rate adversely affect output of the manufacturing sector. This is because Nigerian manufacturing is highly dependent on import of inputs and capital goods. These are paid for in foreign exchange whose rate of exchange is unstable. Thus, this apparent fluctuation is bound to adversely affect activities in the sector that is dependent on external sources for its productive inputs. The methodology adopted for the study is empirical. The econometric tool of regression was used for the analysis. The result of the regression analysis shows that coefficients of the variables carried both positive and negative signs. The study actually shows adverse effect and is all statistically significant in the final analysis.

Lawal, (2016) studied the effect of exchange rate fluctuations on manufacturing sector output from 1986 to 2014, a period of 28 years. Data sourced from Central Bank of Nigeria (CBN) statistical Bulletin and World Development Indicators (WDI) on manufacturing output, Consumer Price Index (CPI), Government Capital Expenditure (GCE) and Real Effective Exchange Rate (EXC)

were analyzed through the multiple regression analysis using Autoregressive Distribution Lag (ARDL) to examine the effect of exchange rate fluctuations on manufacturing sector. Using ARDL it was discovered that exchange rate fluctuations have long run and short run relationship on manufacturing sector output. The result showed that exchange rate has a positive relationship on manufacturing sector output but not significant. However, from the empirical analysis it was discovered that exchange rate is positively related to manufacturing sector output.

Ehinomen and Oladipo (2012) studied exchange rate management and the manufacturing sector performance in the Nigerian economy. Variables like manufacturing GDP, manufacturing direct investment, exchange rate, inflation rate, real interest rate were used Ordinary Least Square (OLS) multiple regression analysis was employed using E-view. The study covered the periods of 1986-2010 with the use of time-series data. The empirical result of this study shows that depreciation which forms part of the structural adjustment policy (SAP) 1986, and which dominated the period under review has no significant relationship with the manufacturing's sector productivity. It was found that in Nigeria, exchange rate appreciation has a significant relationship with domestic output. And that exchange rate appreciation will promote growth in the manufacturing sector. It was also ascertained from the estimated regression line that there is a positive relationship between the manufacturing gross domestic product and inflation.

While study like Adewuyi (2015) has even established that trade policy variables have no significant effect on the manufacturing wage and employment in Nigeria during the SAP reform period.

According to Alexandre *et al.* (2012) in their study of 20 manufacturing sectors in Portugal between 1988 and 2006, they established the role of degree of openness and the technology level

as factors that mediate the impact of exchange rate movements on labour market developments. According to their estimations whereas employment in high-technology sectors seems to be relatively immune to changes in the real exchange rates these appear to have sizable and significant effects on highly open low- technology sectors. In order to assess the roles of openness and technology in the sensitivity of employment to exchange rate movements they computed exchange rate elasticities of employment for different degrees of trade openness. They found out that the interaction between the exchange rate and openness is statistically significant and positive. The analysis of job flows according to the study suggests that the impact of exchange rates on these sectors occurs through employment destruction. This result seems to support the result of a study titled Job Creation, Job Destruction and the Real Exchange Rate by Klein, Schun, and Triest, (2013) where it was established that the effect of the exchange rate on employment is magnified by trade openness. In their study, they measured industry openness using a 5 years moving average of the ratio of total trade to total market sales.

Frenkel (1976) presents a study with two main issues. The first one is the relationship between the Real Exchange Rate (RER) and employment in Argentina, Brazil, Chile and Mexico. The second one is the viability of macroeconomic policies intended to preserve a stable and competitive RER. The results show that both GDP and RER have an expected negative effect on the change in the national unemployment rates in the period covered (1980-2003). This result is also consistent with the findings of Ros (2004). All coefficients are highly significant (at 1%). On average in the 4 countries, a 10% increase in GDP is associated with a 14.9% unemployment rate fall, a 10% appreciation (depreciation) of the RER is associated with a 5.6% increase (fall) in the unemployment rate with a 2 years lag.

Nucci and Pozzolo (2014) in their study use firm level panel data drawn from two high-quality sources to study the relationship between exchange rate fluctuations and labour inputs in Italy. The results of the study confirm that exchange rate fluctuations have a significant effect on employment and hours worked. The coefficient measuring the effect of exchange rate variations through changes in the proceeds from foreign sales is negative and significantly different from zero; the estimated coefficient measuring the effect through the change in the cost of imported inputs is positive and it also statistically significant. Therefore, exchange rate depreciation causes an expansion in the number of hours worked in the subsequent year through the revenue side and a contraction through the cost side. Moreover, the effect stemming from the revenue side increases in absolute value with the share of foreign sales in total revenues while the effect on the cost side is increasing in the share of the firm's expenditure on foreign inputs in total costs. It is also established from the study that the effects of exchange rate fluctuations on labour inputs also depend on the degree of monopoly power of the firm. Nucci and Pozzolo (2014) also note that there are at least five ways in which firms with some degree of market power can adjust in response to a change in the exchange rate. Besides adjusting employment such firms can adjust output prices, wages and investment. This underscores the fact that intervening variables mediate the effect of changes in exchange rates on employment. According to Revenga (2012) both employment and real wages in US manufacturing industries are significantly affected by the real exchange rate fluctuations however, the implication of real exchange rates for real wages is less than for employment but still significant. In her viewpoint, the possible explanation for this result may be in the characteristic of mobility across industries that labour possesses.

As Hall (2015) points out, the behaviour of the labour market is inclined to both wage stickiness and an efficient link between recruitment and job-seekers which probably explains the

weak effect of real exchange rate movements on real wages.

In addition, exchange rate volatility can directly affect firms' employment decisions through its effects on sales, profits and investment risk and planning of firms (Federer, 2013; Aizenman and Marion, 2012). It can also discourage international trade (assuming risk-averse investors) by raising the risk in international transactions (Kenen and Rodrik, 2016; Qian and Varangis, 2014). On the other hand, some studies found weaker implications of exchange rates for employment but more pronounced effects for wages.

Goldberg and Tracy (2012) study the effect of changes in the US\$ exchange rate using labour market data disaggregated both by industry and state. They found that local industries differ significantly in their earnings, hours worked and employment responses to exchange rates. The effects of changes in the exchange rate also differed significantly between different regions of the US as in the study by Branson and Love (2013). Wages were significantly affected by the dollar exchange rate in eight of the twenty manufacturing industries studied.

Employment was found to be negatively related to changes in the exchange rate in twelve of the industries. On average, dollar appreciations were associated with employment declines for both high and low profit margin industrial groupings.

The greater the export orientation of the industry the greater the negative effect on employment. Some of these effects were offset by the positive effect on the prices of imported inputs. Ngandu (2013) in his research titled Exchange Rates and Employment where he studied the South African economy also specifically pay attention to exchange rate and employment using the Computable General Equilibrium Technique. He claimed that whereas a partial equilibrium analysis that only focuses on the manufacturing sector might conclude that appreciation has a

negative impact on employment taking into consideration the economy-wide impacts there can be an overall positive impact on employment from an appreciation. The four worst-affected sectors in terms of employment according to Ngandu include transport equipment, leather products, chemical products and footwear. The sectors that respond positively to the exchange rate include business services other producers other mining and medical and other services.

According to King-George (2013), the effect of exchange rate fluctuations on the Nigeria manufacturing Sector was set to find out the effect of exchange rate on the Nigeria manufacturing Sector. Hypothesis was stated to guide the study. To evaluate this hypothesis, annual time series data on manufacturing gross domestic product a proxy for economic growth, exchange rate, private foreign investment and manufacturing employment rate were collected from the year, 1986 to 2010. A multiple linear regressions were adopted employing Ordinary Least Square (OLS) techniques. This analysis yielded some interesting results. From the results it was observed that exchange rate has no significant effect on economic growth of Nigeria. Also the dependent variable (Manufacturing Gross Domestic Product) can be controlled by, exchange rate, private foreign investment and manufacturing employment rate.

Olufayo and Fagile (2014), their research examined the impact of exchange rate volatility on the performance of Nigeria export sectors, separating the sectors into oil and non-oil sector. They adopted the econometrics method of Seemingly Unrelated Regression (SUR) and in testing the volatility of the exchange rate; they adopted GARCH (generalized autoregressive conditional heteroskedasticity) and examine the effect of floating exchange rate policy on the volatility of the nominal exchange rate. Using the GARCH model, they discovered that there exists volatility in the exchange rate of the country.

Their study established the negative relationship between the volatility of exchange rate and export performance of oil and non-oil sectors using time series data of 1980 to 2011, though it is statistically not significant and also they discovered the significant effect of the floating exchange rate regime in Nigeria, thus, the introduction of floating exchange rate induces instability in the country exchange rate, this is in agreement with the submission of many scholars, who asserted that the shift from fixed exchange rate to floating exchange rate brought about uncertainty in the

exchange rate. More so, the negative relationship between the exchange rate volatility and exports in Nigeria called for drive towards domestication of the country's resources, through inward looking policy that would encourage the local utilization of the country abundant resources and also diversification of the country's exports base.

2.4 Literature gap

The study on impact of foreign exchange rate on manufacturing sector in Nigeria is an aspect that was abandoned in the past but receiving little attention of recent. Focus from the onset was on the impact of exchange rate on the economic growth but recently studies like Opaluwa, et al (2012); Ehinomen and Oladipo (2012); Lawal, (2016). This study also intends to focus on the impact of foreign exchange rate on manufacturing firms in Nigeria, covering a period of twenty seven years (1990-2016), using fifteen (15) manufacturing firms quoted in the Nigeria stock exchange. In addition most study on this area used manufacturing Gross domestic product as a performance measure but this study intends to use returns on equity as a better performance measure also the study intends to disaggregate exchange rate into real effective exchange rate and parallel exchange rate.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

Methodology is the science of method and procedure used in any given analysis or activity. It is a set of principles, which are adopted to specify how to reach a particular conclusion or achieve a given objective. According to Ndiyo (2005), research methodology enables researchers to focus their thought and action on their investigation and improve or maximize their chances of reasoned conclusion, as objectively as possible. Ololube (2016) defined research methodology as the process of arriving at dependable solutions to problems through the planned and systematic collection, analysis, and interpretation of data. It is the most important tool for advancing knowledge, promoting progress, and enabling man to relate more effectively to his environment, accomplish his purposes and resolve his conflicts.

Hence, this chapter will explain the methods used by the researcher in the study. This will enable the researcher to draw inference concerning the impact of exchange rates on Nigerian economy.

3.2 Research Design

For any research activity to be of any significance to the reading audience, it is desirable that such research should be properly designed. According to Asika (2000), research design means the structuring of investigation aimed at identifying variables and their relationship to one another. Also, Ndiyo (2005) opined that research design is the conceptual framework within which an investigation is conducted.

The study choose ex-post facto research design because the study intends to establish cause and effect relationship, also the researcher has no control over the variables of interest and therefore cannot manipulate them.

3.3 Population and Sample Size

The sampling frame which is the list of all the thirty seven (37) manufacturing firms quoted in the Nigeria stock exchange makes up the population of the study. Thus, the sample size of fifteen (15) manufacturing firms out of the population was used, which are: Flour Mills Nigeria Plc (Lagos State), Dangote Cement Plc. (Lagos State), Berger Paints Plc. (Lagos State), Beta Glass Plc. (Lagos State), Premier Paints Plc. (Ogun State), Cutix Plc. (Anambra State), Portland Paints & Products Nigeria Plc. (Lagos State), Meyer Plc. (Lagos State), Honeywell Flour Mill Plc. (Lagos), 7-UP Bottling Company (Lagos), Cadbury Nigeria Plc. (Lagos), Guinness Nigeria Plc. (Lagos), Nestle Nigeria Plc. (Lagos), Golden Guinea Brewery Plc. (Lagos), and VitaFoam Nigeria Plc. (Lagos).

3.4 Sampling Technique

The study employed the judgmental sampling technique to choose the sampling period 1990-2016. The judgmental sampling technique will be applied because the period the data is to be collected is available. The researcher considered only the number of years on which data have been made available in the firms under study.

3.5 Method of Data Collection

In the course of this research work, secondary data was used. Secondary data were obtained from annual report and account of the firms under study and also Central bank of Nigeria Statistical Bulletin (2016). Other secondary sources of data include textbooks, journals, newspapers, etc.

3.6 Techniques of Data Analysis

In order to estimate the regression model, the software the researcher used in the analysis is E-view version 7.0. Chris Brooks (2010) opined that the E-view is encourages and justified for such time series regression analysis because it is more robust, highly technical and highly efficient. The procedure involves specifying the dependent and independent variables. In this process, we shall obtain the values of constant (slope), coefficient of regression and the error term. In addition Caner and Kilian (2012) noted that the estimation will show the t-statistics and the p-values for the coefficient which result in either rejecting or accepting the hypotheses at a specific level of significance. The p-value is the probability of getting a result that is at least as extreme as the critical value.

3.6.1 Model Specification

To achieve the objectives of the study, we build the ideas of our reasoning by construction of econometrics process. Model specification is a process of constructing logical thinking abstraction of economic reality. Model specification entails establishing the coefficient(s) of regression for a sample and making inference on the population. The linear regression equation is stated as follows:

$$ROE = f(REER, PER, INTR, INFR, DOP, MSP) \dots\dots\dots (1)$$

The econometric model is expressed below:

$$ROE = \beta_0 + \beta_1 REER + \beta_2 PER + \beta_3 INTR + \beta_4 INFR + \beta_5 MSP + \mu \dots\dots\dots (2)$$

Where:

ROE = Returns on Equity, (dependent variable)

REER = Real Effective Exchange rate

PER = Parallel Exchange Rate

INTR = Interest Rate

INFR = Inflation rate

MSP = Money Supply

Independent Variables

μ = Stochastic Disturbance (Error Term)

f = Functional Relationship

B_0 = Intercept of relationship in the model/ constant

$B_1 - B_5$ = coefficients of each of the independent variables

By log linearizing, the model becomes;

$$\text{Log}(\text{ROE}) = \beta_0 + \beta_1 \log(\text{REER}) + \beta_2 \log(\text{PER}) + \beta_3 \log(\text{INTR}) + \beta_4 \log(\text{INFR}) + \beta_5 \log(\text{MSP}) + \mu$$

Apriori Expectations

$$\text{REER} > 0$$

The expectation of the result is proposed as real effective exchange rate will have positive impact on returns on equity of manufacturing firms in Nigeria.

$$\text{PER} > 0$$

The expectation of the result is proposed as parallel exchange rate will have positive impact on returns on equity of manufacturing firms in Nigeria.

$INTR < 0$

The expectation of the result is proposed as interest rate will have negative impact on returns on equity of manufacturing firms in Nigeria.

$INFR < 0$

The expectation of the result is proposed as inflation rate will have negative impact on returns on equity of manufacturing firms in Nigeria.

$MSP > 0$

The expectation of the result is proposed as money supply (MSP) will have positive impact on returns on equity of deposit money banks in Nigeria.

3.7 Summary

This chapter examines the materials and methods used in this chapter. This includes research design, population and sample size, sampling techniques, data collection methods and techniques for data collections.

CHAPTER FOUR

RESULTS AND DISCUSSION

4.1 INTRODUCTION

This chapter focuses on presentation and analysis of data sourced from CBN Statistical Bulletin 2016. The data represents each of the samples, and the analysis hinges on the relationship among the variables and their effects constructed in the model specified in chapter three. This chapter will contain presentation and discussion of data, analysis of data, analysis of data technique and discussion of findings.

4.2 Data Presentation

Table 4.2.1: Data for the Independent Variables

YEAR	Independent Variables				MSP %
	REER %	PER %	INTR %	INFR %	
1990	16.55	7.72	17.5	14.43	2
1991	16.88	6.32	16.5	15.14	22.4
1992	17.09	3.74	26.8	16.03	32.9
1993	17.23	2.97	25.5	17.07	12.9
1994	18.98	2.96	20.01	18.02	32.7
1995	19.02	0.74	29.8	18.3	37.4
1996	19.07	30.17	18.32	23.7	63.3
1997	19.22	28.83	21	26.20	53.8
1998	19.88	28.32	20.18	28.50	34.5
1999	53.76	73.91	19.74	30.20	19.4
2000	58.25	73.21	13.54	32.30	16.2
2001	70.58	81.30	18.29	38.30	16
2002	85.13	88.95	21.32	43.30	22.3
2003	106.68	100.63	17.98	49.30	33.1
2004	126.69	107.07	18.29	56.70	48.1
2005	143.78	106.58	24.85	66.90	26.4
2006	148.33	105.02	20.71	72.40	18.8
2007	155.75	106.41	19.18	76.30	13.5
2008	90.31	79.69	17.95	85.10	20.7
2009	97.44	94.30	17.26	95.80	22.6
2010	93.39	96.74	16.94	109.80	36.4
2011	89.82	103.30	15.14	120.70	64.4
2012	79.58	98.09	18.99	135.50	53.4
2013	74.20	95.64	17.59	147.00	14.5

2014	69.51	94.05	16.02	159.80	10
2015	70.83	102.00	16.79	173.10	13.1
2016	78.70	131.30	16.72	200.30	17.4

Source: Central Bank of Nigeria Statistical Bulletin (CBN), (2016).

Table 4.2.2: Data for the (Dependent Variable) Returns on Equity (ROE %)

YEAR	Dependent Variable						
	Flour Mills	Dangote Cement	Berger Paints	Beta Glass	Premier Paints	Cutix Plc.	Portland Paints
1991	0.536	0.071	0.024	0.136	0.239	0.171	0.309
1992	0.521	0.095	0.015	0.399	0.268	0.356	0.234
1993	0.462	0.113	0.001	0.431	0.223	0.477	0.045
1994	0.345	0.208	0.279	0.239	0.231	0.435	0.453
1995	0.324	0.007	0.308	0.268	0.264	0.042	0.235
1996	0.213	0.007	0.399	0.223	0.278	0.028	0.435
1997	0.326	0.024	0.431	0.231	0.013	0.030	0.456
1998	0.423	0.015	0.483	0.264	0.005	0.060	0.214
1999	1.435	0.001	0.457	0.278	0.027	0.045	0.277
2000	0.067	0.005	0.234	0.389	0.032	0.090	0.291
2001	0.252	0.123	0.324	0.220	0.001	0.123	0.282
2002	0.010	0.324	0.324	0.199	0.034	0.026	0.248
2003	0.008	0.195	0.004	0.042	0.075	0.082	0.222
2004	0.015	0.153	0.005	0.028	0.007	0.054	1.272
2005	0.002	0.126	0.123	0.030	0.389	0.043	0.355
2006	0.214	0.342	0.324	0.069	0.324	0.045	0.466
2007	0.093	0.437	0.324	0.060	0.453	0.067	0.622
2008	0.123	0.007	0.374	0.045	0.435	0.324	0.595
2009	0.070	0.007	0.279	0.037	0.156	0.037	0.528
2010	0.073	0.234	0.308	0.034	0.273	0.034	0.425
2011	0.150	0.345	0.477	0.453	0.013	0.096	0.413
2012	0.106	0.109	0.435	0.234	0.005	0.103	0.127
2013	0.927	0.521	0.214	0.324	0.027	0.150	0.206
2014	0.738	0.462	0.234	0.211	0.034	0.090	0.309
2015	0.653	0.345	0.345	0.334	0.096	0.123	0.234
2016	0.692	0.324	0.109	0.421	0.205	0.026	0.341

YEAR	Dependent Variable						Golden Guinea	VitaFoam
	Meyer Plc	Honeywell Flour	7-UP Bottling	Cadbury Plc	Guinness Nig.	Nestle Nig.		
1991	1.272	0.231	0.001	0.001	0.435	0.536	0.213	0.037
1992	0.355	0.264	0.000	0.001	0.456	0.521	0.191	0.034
1993	0.466	0.278	0.000	0.004	0.214	0.462	0.198	0.096
1994	0.622	0.273	0.001	0.003	0.291	0.345	0.196	0.103
1995	0.324	0.013	0.001	0.023	0.282	0.324	0.176	0.150
1996	0.374	0.027	0.004	0.008	0.248	0.213	0.177	0.090
1997	0.308	0.032	0.003	0.001	0.222	0.213	0.108	0.123
1998	0.399	0.001	0.003	0.018	1.272	0.213	0.069	0.026
1999	0.239	0.034	0.023	0.013	0.355	1.435	0.220	0.054
2000	0.268	0.075	0.134	0.093	0.466	0.927	0.199	0.043
2001	0.268	0.007	0.034	0.123	0.622	0.738	0.205	0.456
2002	0.233	0.389	0.324	0.070	0.595	0.653	0.171	0.667
2003	0.231	0.324	0.000	0.073	0.528	0.536	0.356	0.120
2004	0.264	0.453	0.000	0.150	0.425	0.191	0.477	0.096
2005	0.278	0.435	0.000	0.106	0.413	0.198	0.435	0.068
2006	0.289	0.156	0.001	0.927	0.127	0.196	0.234	0.217
2007	0.324	0.273	0.000	0.738	0.206	0.176	0.345	0.218
2008	0.453	0.013	0.008	0.653	0.309	0.177	0.109	0.413
2009	0.483	0.005	0.001	0.536	0.234	0.214	0.263	0.289
2010	0.457	0.027	0.018	0.521	0.341	0.234	0.136	0.243
2011	0.234	0.067	0.013	0.462	0.909	0.345	0.108	0.288
2012	0.324	0.253	0.014	0.345	1.272	0.109	0.069	0.243
2013	0.324	0.010	0.010	0.324	0.355	0.521	0.220	0.291
2014	0.329	0.008	0.010	0.213	0.466	0.462	0.199	0.358
2015	0.268	0.002	0.127	0.213	0.622	0.345	0.042	0.289
2016	0.223	0.015	0.435	0.326	0.653	0.324	0.028	0.622

Source: Annual Report of Firms under Study (2016).

4.3 Discussion of Data

Table 4.2.1 above is the data for all the independent variables under study (REER, PER, INTR, INF and MSP) during the period 1990 – 2016. REER recorded 16.55 in 1990, further increased to 58.25 in year 2000, in 2006, it drastically increased to 148.33 and fell to 79.58 in 2012, finally reduced to 78.70 in 2016. PER recorded 7.72 in 1990, increased to 77.21 in year 2000, furthermore

drastically increased to 105.02 in 2016. Inflation rate (INF) started low in 1990 14.43 and as time went on, it recorded a gradual increase till 2016 as it recorded 72.40. money supply recorded a high fluctuating rate all through the period under study, it also fell in 2016 to 18.8.

Returns on equity was the proxy used to measure manufacturing performance in Nigeria, for the purpose of this study the average returns on equity of all the manufacturing firms under study were used.

4.4 Analysis of Data Techniques

4.4.1 Ordinary Least Square (OLS)

Table 4.2.2: Ordinary Least Square (OLS) Result

Dependent Variable: ROE
 Method: Least Squares
 Date: 12/02/17 Time: 03:52
 Sample: 1990 2016
 Included observations: 27

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	10240.53	861.9526	11.88062	0.0000
REER	27564.29	12311.18	2.238964	0.0361
PER	43.57128	10.08997	4.318279	0.0003
INTR	-5.957460	2.587455	-2.302440	0.0316
INF	193.0052	19.86838	9.714190	0.0000
MSP	5.488378	2.119677	2.589252	0.0171

R-squared	0.987175	Mean dependent var	37276.75
Adjusted R-squared	0.984122	S.D. dependent var	17800.00
S.E. of regression	2242.962	Akaike info criterion	18.46211
Sum squared resid	1.06E+08	Schwarz criterion	18.75008
Log likelihood	-243.2385	Hannan-Quinn criter.	18.54774
F-statistic	323.2912	Durbin-Watson stat	2.231710
Prob(F-statistic)	0.000000		

Estimation Command:

=====
 LS ROE C REER PER INTR INF MSP

Estimation Equation:

=====

$$ROE = C(1) + C(2)*REER + C(3)*PER + C(4)*INTR + C(5)*INF + C(6)*MSP$$

Substituted Coefficients:

=====

$$ROE = 10240.5321566 + 27564.2905494*REER + 43.5712842006*PER - 5.95746035112*INTR + 193.005165612*INF + 5.48837788877*MSP$$

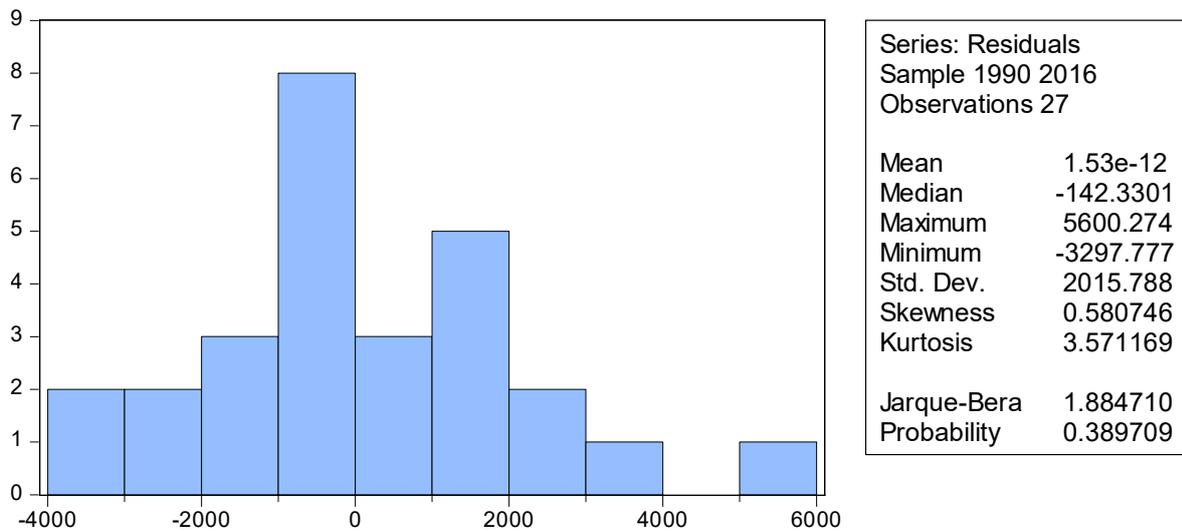
Source: Author's Computation using E-view 7.0 (2017)

Table 4.2.2 shows the result for ordinary least square. Real effective exchange rate (REER) is positive in the coefficient column which connotes that a unit increase in real effective exchange rate can lead to 10240 increase in returns on equity of manufacturing firms in Nigeria. Parallel exchange rate (PER) is positive in the coefficient column and signifies that a unit increase in parallel exchange rate can lead to 43.5% increase in returns on equity of manufacturing firms in Nigeria. Interest rate (INTR) is negative also a unit increase in interest rate can lead to -5.95% decrease in returns on equity. Inflation rate (INF) and money supply (MSP) are positive and a unit increase in them can lead to 193.00 and 5.48 increase in returns on equity of manufacturing firms in Nigeria respectively.

All the independent variables have significant impact on returns on equity of manufacturing firms in Nigeria.

4.4.2 Diagnostic Test

Table 4.2.3: Normality test



Source: Author’s Computation using E-view 7.0 (2017)

The series distribution is normal as the p-value associated with JB- Jarque Bera statistics is 0.389 which is greater than the critical value of 0.05.

Table 4.2.4: Serial Correlation Test

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	3.727732	Prob. F(2,19)	0.1431
Obs*R-squared	7.608920	Prob. Chi-Square(2)	0.1223

Source: Author’s Computation using E-view 7.0 (2017)

The p-value of the f-statistics is 0.143 which is greater than the critical value of 5%, we conclude by accepting H_0 that there is no presence of serial correlation.

Table 4.2.5: Heteroskedasticity Test

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	1.202043	Prob. F(5,21)	0.3423
Obs*R-squared	6.007942	Prob. Chi-Square(5)	0.3054
Scaled explained SS	4.672373	Prob. Chi-Square(5)	0.4572

Source: Author’s Computation using E-view 7.0 (2017)

The p-value of the observed R-squared is 0.305 which is greater than the critical value of 5%, meaning that we accept null hypothesis that the residuals are not heteroscedastic in nature.

Table 4.2.6: Stability Test

Ramsey RESET Test

Equation: UNTITLED

Specification: ROE C REER PER INTR INF MSP

Omitted Variables: Squares of fitted values

	Value	df	Probability
t-statistic	3.662975	20	0.0015
F-statistic	13.41739	(1, 20)	0.0015
Likelihood ratio	13.86029	1	0.0002

Source: Author's Computation using E-view 7.0 (2017)

The p-value of the f-stat of ramsey reset test is 0.001 which is less than critical value of 5%, we conclude by accepting H_1 that the series are not in functional form and it is not structurally stable.

4.4.3 Unit Root Test

Table 4.2.7: Unit root test for ROE

Null Hypothesis: D(ROE,2) has a unit root
 Exogenous: Constant
 Lag Length: 0 (Automatic - based on SIC, maxlag=6)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-3.412934	0.0206
Test critical values: 1% level	-3.737853	
5% level	-2.991878	
10% level	-2.635542	

Source: Author's Computation using E-view 7.0 (2017)

The Augmented Dicker Fuller test (ADF) at second difference I(2) for ROE is $-3.412 > -2.991$ at 0.05 level of significance, this shows no unit root and that the series is stationary.

Table 4.2.8: Unit root test for REER

Null Hypothesis: D(REER,2) has a unit root
 Exogenous: Constant
 Lag Length: 4 (Automatic - based on SIC, maxlag=6)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-5.640428	0.0002
Test critical values: 1% level	-3.808546	
5% level	-3.020686	
10% level	-2.650413	

Source: Author's Computation using E-view 7.0 (2017)

The Augmented Dicker Fuller test (ADF) at second difference I(2) for REER is $-5.6404 > -3.020$ at 0.05 level of significance, this shows no unit root and that the series is stationary.

Table 4.2.9: Unit root test for PER

Null Hypothesis: D(PER) has a unit root
 Exogenous: Constant
 Lag Length: 0 (Automatic - based on SIC, maxlag=6)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-4.372414	0.0022
Test critical values: 1% level	-3.724070	

5% level	-2.986225
10% level	-2.632604

Source: Author's Computation using E-view 7.0 (2017)

The Augmented Dicker Fuller test (ADF) at first difference I(1) for PER is $-4.372 > -2.986$ at 0.05 level of significance, this shows no unit root and that the series is stationary.

Table 4.2.10: Unit root test for INTR

Null Hypothesis: D(INTR) has a unit root
 Exogenous: Constant
 Lag Length: 0 (Automatic - based on SIC, maxlag=6)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-4.391648	0.0021
Test critical values:		
1% level	-3.724070	
5% level	-2.986225	
10% level	-2.632604	

Source: Author's Computation using E-view 7.0 (2017)

The Augmented Dicker Fuller test (ADF) at first difference I(1) for INTR is $-4.391 > -2.986$ at 0.05 level of significance, this shows no unit root and that the series is stationary.

Table 4.2.11: Unit root test for INF

Null Hypothesis: D(INF) has a unit root
 Exogenous: Constant
 Lag Length: 0 (Automatic - based on SIC, maxlag=6)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-3.357253	0.0228
Test critical values:		
1% level	-3.724070	
5% level	-2.986225	
10% level	-2.632604	

Source: Author's Computation using E-view 7.0 (2017)

The Augmented Dicker Fuller test (ADF) at first difference I(1) for INF is $-3.357 > -2.986$ at 0.05 level of significance, this shows no unit root and that the series is stationary.

Table 4.2.12: Unit root test for MSP

Null Hypothesis: D(MSP,2) has a unit root
 Exogenous: Constant
 Lag Length: 5 (Automatic - based on SIC, maxlag=6)

t-Statistic	Prob.*
-------------	--------

Augmented Dickey-Fuller test statistic		-3.549772	0.0179
Test critical values:	1% level	-3.831511	
	5% level	-3.029970	
	10% level	-2.655194	

Source: Author's Computation using E-view 7.0 (2017)

The Augmented Dicker Fuller test (ADF) at second difference I(2) for MSP is $-3.549 > -3.029$ at 0.05 level of significance, this shows no unit root and that the series is stationary.

Table 4.2.13: Granger Causality Test

Diagnostic Check	F-stat	Prob.	Conclusion
REER and ROE	10.1294	0.0009	REER granger cause ROE
ROE and REER	7.62524	0.0035	ROE granger cause REER
PER and ROE	0.63600	0.5398	PER does not granger cause ROE
ROE and PER	1.99297	0.1625	ROE does not granger cause PER
INTR and ROE	6.63804	0.0062	INTR granger cause ROE
ROE and INTR	2.95789	0.0749	ROE does not granger cause INTR
INF and ROE	0.81969	0.0062	INF granger cause ROE
ROE and INF	8.85650	0.0487	ROE granger cause INF

Prob. Value < 0.05 , Sig. at 5% for granger causality test, vice versa.

Source: Author's Computation using E-view 7.0 (2017)

Table 4.2.14: Johansen Co integration

Date: 12/02/17 Time: 04:10
Sample (adjusted): 1991 2016
Included observations: 26 after adjustments
Trend assumption: Linear deterministic trend
Series: ROE REER PER INTR INF MSP
Lags interval (in first differences):

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.851317	111.9662	95.75366	0.0024
At most 1	0.643477	62.41173	69.81889	0.1689
At most 2	0.428389	35.59648	47.85613	0.4169
At most 3	0.402802	21.05478	29.79707	0.3542
At most 4	0.232283	7.651592	15.49471	0.5034
At most 5	0.029514	0.778919	3.841466	0.3775

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**

Source: Author's Computation using E-view 7.0 (2017)

The co integration result shows that the trace statistics of ROE (None *) is greater than 5% critical value, while the trace statistics of real effective exchange rate (REER) (At most 1), parallel exchange rate (PER) (At most 2), interest rate (At most 3), inflation rate (At most 4) and money supply (At most 5) are less than 5% critical value.

4.5 Discussion of Findings

Ho₁: There is no significant relationship between real effective exchange rate (REER) and return on equity (ROE) of manufacturing firms in Nigeria.

The ordinary least square (OLS) result in table 4.2.2 connote that the p-value t-stat of real effective exchange rate (REER) is 0.0361 which is less than 0.05 significant level, thereby the null hypothesis is rejected and the alternate hypothesis is accepted and signifies that real effective exchange rate (REER) have significant impact on return on equity of manufacturing firms in Nigeria. The economic implication of rejecting the null hypothesis connote the existence of international competitiveness, further the existence of trade flows, incentives for reallocation between tradable and the non-tradable sectors.

Ho₂: There is no significant relationship between parallel exchange rate (PER) and return on equity (ROE) of manufacturing firms in Nigeria.

The ordinary least square (OLS) result in table 4.2.2 connote that the p-value t-stat of parallel exchange rate (PER) is 0.000 which is less than 0.05 significant level, thereby the null hypothesis is rejected and the alternate hypothesis is accepted and signifies that parallel exchange rate (PER) have significant impact on return on equity of manufacturing firms in Nigeria.

Ho₃: Interest rate (INTR) does not have any significant impact on return on equity (ROE) of manufacturing firms in Nigeria.

The ordinary least square (OLS) result in table 4.2.2 connote that the p-value t-stat of interest rate (INTR) is 0.0316 which is less than 0.05 significant level, thereby the null hypothesis is rejected and the alternate hypothesis is accepted and signifies that interest rate (INTR) have significant impact on return on equity of manufacturing firms in Nigeria.

The economic implication of rejecting the null hypothesis connote the existence of credit to manufacturing sector, which will in turn improve the capital structure of manufacturing firms in Nigeria and will foster high performance.

Ho₄: Inflation rate (INFR) does not have any significant impact on return on equity (ROE) of manufacturing firms in Nigeria.

The ordinary least square (OLS) result in table 4.2.2 connote that the p-value t-stat of inflation rate (INFR) is 0.000 which is less than 0.05 significant level, thereby the null hypothesis is rejected and the alternate hypothesis is accepted and signifies that inflation rate (INFR) have significant impact on return on equity of manufacturing firms in Nigeria. The economic implication of rejecting the null hypothesis connote the stable price level of goods of services.

Ho₅: There is no significant relationship between money supply (MSP) and return on equity (ROE) of manufacturing firms in Nigeria.

The ordinary least square (OLS) result in table 4.2.2 connote that the p-value t-stat of parallel exchange rate (PER) is 0.000 which is less than 0.05 significant level, thereby the null hypothesis

is rejected and the alternate hypothesis is accepted and signifies that money supply (MSP) have significant impact on return on equity of manufacturing firms in Nigeria.

Holistically the result reveals that all the independent variables under study have significant impact on returns on equity of manufacturing firms in Nigeria because their p-values are all less than 5% significant level.

The model has high explanatory and predictive power as suggested by the R-squared and adjusted R-squared respectively. The R^2 is 0.987 and $AdjR^2$ is 0.984, this further shows that (REER, PER, INTR, INF and MSP) have 98% positive impact to ROE of manufacturing firms in Nigeria, more so ($AdjR^2$) is 0.984 which suggest that 98% of the independent variables could be explained by the changes in returns on equity and the remaining 2% could not be explained due to some error in the financial system.

The Durbin Watson test is 2.231 which revealed no presence of serial correlation and good for prediction. Globally, the p-value of the F-stat is $0.000 < 0.05$ which suggest that the whole independent variables (REER, PER, INTR, INF and MSP) are statistically significant.

The diagnostic test was applied to confirm the assumptions of the ordinary least square (OLS) result, it emphasizes on four major test which are normality, serial correlation, heteroskedasticity and stability test. Table 4.2.3 shows the normality test and suggest that the series distribution is normal as the p-value is 0.389 which is greater than 5% significant level, we accept H_0 which states that the residuals are normally distributed and it is desirable and further connote that the influence of other omitted and neglected variables is small and at best random. While table 4.2.4 is serial correlation test and shows that the p-value of the f-statistics is 0.122 which is greater that the

critical value of 5%, we conclude by accepting H_0 that there is no presence of serial correlation which is desirable and implies that the variables are independently distributed.

Table 4.2.5 unveils the result for heteroskedasticity test, the p-value of the observed R-squared is 0.305 which is greater than the critical value of 5%, therefore we accept null hypothesis that the residuals are not heteroscedastic meaning residuals are homoscedastic and it's desirable. Also the p-value of the f-stat in functionality test is 0.001 which implies that the series is not in functional form.

Unit root is a useful test in diagnostic procedure for time series data. It is used to find out the stationarity behavior of variables. The Augmented Dicker Fuller (ADF) test for unit root varies between first difference $I(1)$ and second difference $I(2)$. ROE is $-3.412 > 2.991$ at 5% significant level, this shows no unit root and that the series is stationary. REER is $-5.640 > 3.020$ at 5% significant level, this shows no unit root and that the series is stationary. PER is $-4.372 > 2.986$ at 5% significant level, this shows no unit root and that the series is stationary. INTR is $-4.391 > 2.986$ at 5% significant level, this shows no unit root and that the series is stationary. INF is $-3.357 > 2.986$ at 5% significant level, this shows no unit root and that the series is stationary. MSP is $-3.549 > 3.029$ at 0.05 significant level, this shows no unit root and that the series is stationary. The result for unit root suggests that there is no presence of unit root as the ADF values are greater than the critical value at 5%. Hence, the variables are stationary which informs granger causality and co integration test.

Causality test is employed at this stage to know the causal relationship between the variables under study, the basis for conducting this test is to enable us know whether the independent variables can actually cause variations in the dependent variable or vice versa. From the results in table

4.2.13, the p-value of REER and ROE is 0.0009 which implies that REER granger cause ROE and the p-value of ROE and REER is 0.0035 which also signify that ROE in return granger cause REER which further implies that there is a long run effect and dual causality exist between REER and ROE.

The p-value of PER and ROE is 0.539 which connote that PER does not granger cause ROE while ROE and PER is 0.162 which connotes that ROE does not also granger cause PER and signify a short run and unidirectional effect.

The p-value of INTR and ROE is 0.006 which connote that INTR granger cause ROE while ROE and INTR is 0.074 which connote that ROE does not granger cause INTR and signify a short run and unidirectional effect.

The p-value of INF and ROE is 0.4548 which connote that INF does not granger cause ROE while ROE and INF is 0.0018 which connote that ROE granger cause INF and signify a short run and unidirectional effect.

The p-value of MSP and ROE is 0.0062 which connote that MSP granger cause ROE while ROE and MSP is 0.0487 which connote that ROE granger cause MSP and shows long run effect and dual causality exist between MSP and ROE.

Ezirim, (2012) stated that Johansen co-integration test steps in to determine the number of co integrating equation and also investigating presence or absence of spurious regression through the measure of presence or absence of full rank. The Johansen co-integration result shows that the trace statistics of ROE (None *) is greater than 5% critical value, this is enough evidence to accept H1 and conclude that ROE is co-integrated at (None *). While the trace statistics of real effective exchange rate (At most 1), parallel exchange rate (At most 2), interest rate (At most 3), inflation

rate (At most 4) and money supply (At most 5) are less than 5% critical value, this is enough evidence to reject H1 and conclude that the variables are not co-integrated. Also the probability associated with the trace statistic for (At most 1) - (At most 5) are greater than 5% which connote non-existence of long term relationship between the dependent variable and independent variables.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Summary

The desire of every developing country like Nigeria is to ensure rapid industrialization. It is logical to say that industrialization if correctly harnessed can transform and stabilize a country structurally.

In the bid to achieve macroeconomic stability, Nigeria's monetary authorities have adopted various exchange rate arrangements over the years. It shifted from a fixed regime in the 1960s to a pegged arrangement between the 1970s and the mid-1980s, and finally, to the various types of the floating regime since 1986, following the adoption of the Structural Adjustment Programme (SAP). The fixed exchange rate regime induced an overvaluation of the naira and was supported by exchange control regulations that engendered significant distortions in the economy.

5.2 Conclusion

Based on the discussion of findings, the following are the conclusion:

- i. The Ordinary least square test conclude that real effective exchange rate (REER) parallel exchange rate, interest rate, inflation and money supply have significant impact on returns on equity of manufacturing firms in Nigeria. We reject the null hypothesis H_0 and conclude that foreign exchange rate have significant impact on performance of manufacturing sector in Nigeria.
- ii. The diagnostic test suggests we accept H_0 that the series distribution is normal, which is desirable. For serial correlation test, we accept H_0 that the residuals are not serially

correlated and it connotes that each of the observation are independent of one another. In Heteroskedasticity test we accept the null hypothesis H_0 that the residuals are homoscedastic which signify that they are of equal variance and desirable.

- iii. For unit root test, all the variables were stationary at second difference 1(2) except for parallel exchange rate, interest rate and inflation rate which were stationary at first difference 1(1).
- iv. There exist a dual causality relationship between REER and ROE and MSP and ROE while a uni-directional granger causality relationship exist among PER and ROE, INTR and ROE, INF and ROE.

The study is consistent with the works of Ehinomen and Oladipo (2012), Frenkel (1976) also contradicts the study of Opaluwa, Umeh and Ameh (2012), Lawal, (2016).

5.3 Recommendations

1. Excess provisions for inflation should be cut to barest minimal level to avert the ideal of external borrowing which most consequently result in external debt and interest rate services.
2. The monetary authority should continue to initiate policies that will stabilize exchange rate and remove negative effect of exchange rate fluctuations on Nigeria's manufacturing performance.
3. Since manufacturing sector depends much on foreign inputs, and for the importation of these foreign inputs not be continuous, efforts should be geared towards improving the level of technological advancement, increasing agricultural production, and developing local raw materials in the country.

4. The government should ensure stable electricity, good roads, water, telecommunication etc. And more importantly as regards this study, the exchange rate appreciation is what the Government should intensify efforts to achieve in Nigeria.
5. Furthermore a technological policy aimed at developing a local engineering industry is advocated. By so doing, the link between agriculture and the manufacturing sector will be established, leading to expansion of export base which would attract more foreign exchange into the country. This could culminate into high external reserves build up and reduce adverse pressure on inflation rate and money supply.
6. The monetary authority (the Central Bank of Nigeria) should monitor deposit money banks to ensure unethical practices (high interest rate) are not condoned.

5.4 Contribution to Knowledge

The result of this research has been able to empirically establish the following:

1. The study used disaggregated approach (real effective exchange rate and parallel exchange rate) to determine the impact of foreign exchange rate on performance of manufacturing sector in Nigeria.
2. The research work provided a predictive power for foreign exchange rate and manufacturing sector performance in Nigeria using: $ROE = 10240.5321566 + 27564.2905494*REER + 43.5712842006*PER + 5.95746035112*INTR + 193.005165612*INF + 5.48837788877*MSP$.

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APPENDIX

Ordinary Least Square (OLS) Result

Dependent Variable: ROE
 Method: Least Squares
 Date: 12/02/17 Time: 03:52
 Sample: 1990 2016
 Included observations: 27

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	10240.53	861.9526	11.88062	0.0000
REER	27564.29	12311.18	2.238964	0.0361
PER	43.57128	10.08997	4.318279	0.0003
INTR	-5.957460	2.587455	-2.302440	0.0316
INF	193.0052	19.86838	9.714190	0.0000
MSP	5.488378	2.119677	2.589252	0.0171

R-squared	0.987175	Mean dependent var	37276.75
Adjusted R-squared	0.984122	S.D. dependent var	17800.00
S.E. of regression	2242.962	Akaike info criterion	18.46211
Sum squared resid	1.06E+08	Schwarz criterion	18.75008
Log likelihood	-243.2385	Hannan-Quinn criter.	18.54774
F-statistic	323.2912	Durbin-Watson stat	2.231710
Prob(F-statistic)	0.000000		

Estimation Command:

=====
 LS ROE C REER PER INTR INF MSP

Estimation Equation:

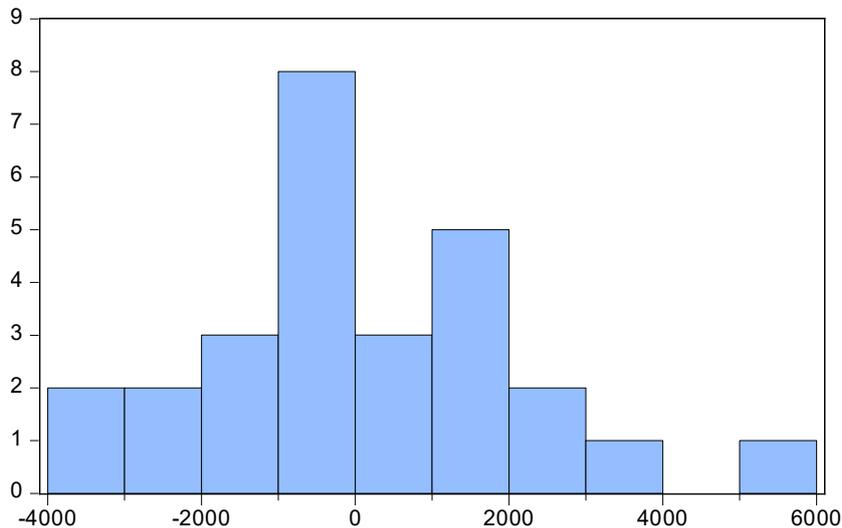
=====
 ROE = C(1) + C(2)*REER + C(3)*PER + C(4)*INTR + C(5)*INF + C(6)*MSP

Substituted Coefficients:

=====
 ROE = 10240.5321566 + 27564.2905494*REER + 43.5712842006*PER - 5.95746035112*INTR +
 193.005165612*INF + 5.48837788877*MSP

Diagnostic Test

Normality test



Series: Residuals	
Sample 1990 2016	
Observations 27	
Mean	1.53e-12
Median	-142.3301
Maximum	5600.274
Minimum	-3297.777
Std. Dev.	2015.788
Skewness	0.580746
Kurtosis	3.571169
Jarque-Bera	1.884710
Probability	0.389709

SERIAL CORRELATION TEST

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	3.727732	Prob. F(2,19)	0.1431
Obs*R-squared	7.608920	Prob. Chi-Square(2)	0.1223

Test Equation:

Dependent Variable: RESID

Method: Least Squares

Date: 12/02/17 Time: 03:56

Sample: 1990 2016

Included observations: 27

Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	25.80579	773.9502	0.033343	0.9737
REER	-4993.444	11335.59	-0.440510	0.6645
PER	0.117461	10.50282	0.011184	0.9912
INTR	0.706153	2.378242	0.296922	0.7697
INF	7.141061	20.27898	0.352141	0.7286
MSP	-0.502123	1.953485	-0.257039	0.7999
RESID(-1)	0.609011	0.224552	2.712122	0.0138
RESID(-2)	-0.337735	0.262473	-1.286739	0.2136

R-squared	0.281812	Mean dependent var	1.53E-12
Adjusted R-squared	0.017216	S.D. dependent var	2015.788

S.E. of regression	1998.361	Akaike info criterion	18.27924
Sum squared resid	75875474	Schwarz criterion	18.66319
Log likelihood	-238.7697	Hannan-Quinn criter.	18.39341
F-statistic	1.065066	Durbin-Watson stat	1.672383
Prob(F-statistic)	0.422119		

HETEROSKEDASTICITY TEST

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	1.202043	Prob. F(5,21)	0.3423
Obs*R-squared	6.007942	Prob. Chi-Square(5)	0.3054
Scaled explained SS	4.672373	Prob. Chi-Square(5)	0.4572

Test Equation:

Dependent Variable: RESID^2

Method: Least Squares

Date: 12/02/17 Time: 03:57

Sample: 1990 2016

Included observations: 27

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	6744716.	2410705.	2.797819	0.0108
REER	-49404951	34431850	-1.434862	0.1661
PER	23816.16	28219.57	0.843959	0.4082
INTR	8726.086	7236.583	1.205830	0.2413
INF	3541.078	55567.78	0.063725	0.9498
MSP	-7894.172	5928.302	-1.331608	0.1973

R-squared	0.222516	Mean dependent var	3912906.
Adjusted R-squared	0.037401	S.D. dependent var	6393814.
S.E. of regression	6273106.	Akaike info criterion	34.33457
Sum squared resid	8.26E+14	Schwarz criterion	34.62254
Log likelihood	-457.5167	Hannan-Quinn criter.	34.42020
F-statistic	1.202043	Durbin-Watson stat	1.078151
Prob(F-statistic)	0.342268		

STABILITY TEST

Ramsey RESET Test

Equation: UNTITLED

Specification: ROE C REER PER INTR INF MSP

Omitted Variables: Squares of fitted values

	Value	df	Probability
t-statistic	3.662975	20	0.0015
F-statistic	13.41739	(1, 20)	0.0015

Likelihood ratio	13.86029	1	0.0002
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F-test summary:

	Sum of Sq.	df	Mean Squares
Test SSR	42418828	1	42418828
Restricted SSR	1.06E+08	21	5030879.
Unrestricted SSR	63229636	20	3161482.
Unrestricted SSR	63229636	20	3161482.

LR test summary:

	Value	df
Restricted LogL	-243.2385	21
Unrestricted LogL	-236.3084	20

Unrestricted Test Equation:

Dependent Variable: ROE

Method: Least Squares

Date: 12/02/17 Time: 03:58

Sample: 1990 2016

Included observations: 27

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	14126.04	1261.777	11.19535	0.0000
REER	14248.20	10414.48	1.368114	0.1865
PER	23.24433	9.735095	2.387684	0.0269
INTR	-2.623800	2.243985	-1.169259	0.2560
INF	39.58321	44.74797	0.884581	0.3869
MSP	2.835106	1.829801	1.549407	0.1370
FITTED^2	7.38E-06	2.01E-06	3.662975	0.0015

R-squared	0.992324	Mean dependent var	37276.75
Adjusted R-squared	0.990022	S.D. dependent var	17800.00
S.E. of regression	1778.056	Akaike info criterion	18.02284
Sum squared resid	63229636	Schwarz criterion	18.35880
Log likelihood	-236.3084	Hannan-Quinn criter.	18.12274
F-statistic	430.9485	Durbin-Watson stat	1.033625
Prob(F-statistic)	0.000000		

UNIT ROOT

ROE (2ND DIFF)

Null Hypothesis: D(ROE,2) has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic - based on SIC, maxlag=6)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-3.412934	0.0206

Test critical values:	1% level	-3.737853
	5% level	-2.991878
	10% level	-2.635542

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

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(ROE,3)

Method: Least Squares

Date: 12/02/17 Time: 04:00

Sample (adjusted): 1993 2016

Included observations: 24 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(ROE(-1),2)	-0.864760	0.253377	-3.412934	0.0025
C	-72.01395	227.5809	-0.316432	0.7547
R-squared	0.346174	Mean dependent var		-143.2742
Adjusted R-squared	0.316455	S.D. dependent var		1342.834
S.E. of regression	1110.212	Akaike info criterion		16.94214
Sum squared resid	27116553	Schwarz criterion		17.04032
Log likelihood	-201.3057	Hannan-Quinn criter.		16.96819
F-statistic	11.64812	Durbin-Watson stat		1.723010
Prob(F-statistic)	0.002493			

REER (2ND DIFF)

Null Hypothesis: D(REER,2) has a unit root

Exogenous: Constant

Lag Length: 4 (Automatic - based on SIC, maxlag=6)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-5.640428	0.0002
Test critical values:		
	1% level	-3.808546
	5% level	-3.020686
	10% level	-2.650413

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

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(REER,3)

Method: Least Squares

Date: 12/02/17 Time: 04:01

Sample (adjusted): 1997 2016

Included observations: 20 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(REER(-1),2)	-16.04176	2.844068	-5.640428	0.0001
D(REER(-1),3)	13.21722	2.493813	5.300006	0.0001

D(REER(-2),3)	10.43846	2.014151	5.182558	0.0001
D(REER(-3),3)	6.804071	1.314813	5.174934	0.0001
D(REER(-4),3)	2.588917	0.677847	3.819325	0.0019
C	0.014853	0.026695	0.556394	0.5867
<hr/>				
R-squared	0.781437	Mean dependent var	0.043050	
S.D. dependent var	0.214410	S.E. of regression	0.116774	
Akaike info criterion	-1.213823	Sum squared resid	0.190907	
Schwarz criterion	-0.915104	Log likelihood	18.13823	
Hannan-Quinn criter.	-1.155510	F-statistic	10.01095	
Durbin-Watson stat	1.494409			

PER (1ST DIFF)

Null Hypothesis: D(PER) has a unit root
 Exogenous: Constant
 Lag Length: 0 (Automatic - based on SIC, maxlag=6)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-4.372414	0.0022
Test critical values:		
1% level	-3.724070	
5% level	-2.986225	
10% level	-2.632604	

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

Augmented Dickey-Fuller Test Equation
 Dependent Variable: D(PER,2)
 Method: Least Squares
 Date: 12/02/17 Time: 04:03
 Sample (adjusted): 1992 2016
 Included observations: 25 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(PER(-1))	-0.981832	0.224552	-4.372414	0.0002
C	10.66841	7.311027	1.459222	0.1580
<hr/>				
R-squared	0.453915	Mean dependent var	-2.798400	
S.D. dependent var	43.91895	S.E. of regression	33.15307	
Akaike info criterion	9.916766	Sum squared resid	25279.90	
Schwarz criterion	10.01428	Log likelihood	-121.9596	
Hannan-Quinn criter.	9.943811	F-statistic	19.11800	
Durbin-Watson stat	1.630837			

INTR (1ST DIFF)

Null Hypothesis: D(INTR) has a unit root
 Exogenous: Constant
 Lag Length: 0 (Automatic - based on SIC, maxlag=6)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-4.391648	0.0021
Test critical values:		
1% level	-3.724070	
5% level	-2.986225	
10% level	-2.632604	

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

Augmented Dickey-Fuller Test Equation
 Dependent Variable: D(INTR,2)
 Method: Least Squares
 Date: 12/02/17 Time: 04:04
 Sample (adjusted): 1992 2016
 Included observations: 25 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(INTR(-1))	-0.940077	0.214060	-4.391648	0.0002
C	135.0146	212.2076	0.636238	0.5309
R-squared	0.456092	Mean dependent var		53.54000
Adjusted R-squared	0.432444	S.D. dependent var		1403.009
S.E. of regression	1056.975	Akaike info criterion		16.84083
Sum squared resid	25695528	Schwarz criterion		16.93834
Log likelihood	-208.5104	Hannan-Quinn criter.		16.86787
F-statistic	19.28657	Durbin-Watson stat		1.905404
Prob(F-statistic)	0.000212			

INF (1ST DIFF)

Null Hypothesis: D(INF) has a unit root
 Exogenous: Constant
 Lag Length: 0 (Automatic - based on SIC, maxlag=6)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-3.357253	0.0228
Test critical values:		
1% level	-3.724070	
5% level	-2.986225	
10% level	-2.632604	

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

Augmented Dickey-Fuller Test Equation
 Dependent Variable: D(INF,2)
 Method: Least Squares
 Date: 12/02/17 Time: 04:06

Sample (adjusted): 1992 2016
Included observations: 25 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(INF(-1))	-0.716799	0.213508	-3.357253	0.0027
C	5.614945	2.778590	2.020789	0.0551
R-squared	0.328882	Mean dependent var		0.864000
Adjusted R-squared	0.299702	S.D. dependent var		14.28729
S.E. of regression	11.95614	Akaike info criterion		7.876986
Sum squared resid	3287.835	Schwarz criterion		7.974496
Log likelihood	-96.46232	Hannan-Quinn criter.		7.904031
F-statistic	11.27115	Durbin-Watson stat		1.675958
Prob(F-statistic)	0.002726			

MSP (2ND DIFF)

Null Hypothesis: D(MSP,2) has a unit root

Exogenous: Constant

Lag Length: 5 (Automatic - based on SIC, maxlag=6)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-3.549772	0.0179
Test critical values:		
1% level	-3.831511	
5% level	-3.029970	
10% level	-2.655194	

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

Warning: Probabilities and critical values calculated for 20 observations and may not be accurate for a sample size of 19

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(MSP,3)

Method: Least Squares

Date: 12/02/17 Time: 04:07

Sample (adjusted): 1998 2016

Included observations: 19 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(MSP(-1),2)	-4.795732	1.350997	-3.549772	0.0040
D(MSP(-1),3)	3.429101	1.248784	2.745953	0.0177
D(MSP(-2),3)	2.730244	1.064698	2.564336	0.0248
D(MSP(-3),3)	2.279400	0.835046	2.729670	0.0183
D(MSP(-4),3)	1.154309	0.563968	2.046764	0.0632
D(MSP(-5),3)	1.097111	0.326697	3.358188	0.0057
C	-145.8399	227.9924	-0.639670	0.5344
R-squared	0.919339	Mean dependent var		-77.94474
Adjusted R-squared	0.879009	S.D. dependent var		2810.539
S.E. of regression	977.6113	Akaike info criterion		16.88541
Sum squared resid	11468685	Schwarz criterion		17.23336
Log likelihood	-153.4114	Hannan-Quinn criter.		16.94430
F-statistic	22.79522	Durbin-Watson stat		1.487164

GRANGER CAUSALITY

Pairwise Granger Causality Tests

Date: 12/02/17 Time: 04:09

Sample: 1990 2016

Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
REER does not Granger Cause ROE	25	10.1294	0.0009
ROE does not Granger Cause REER		7.62524	0.0035
PER does not Granger Cause ROE	25	0.63600	0.5398
ROE does not Granger Cause PER		1.99297	0.1625
INTR does not Granger Cause ROE	25	6.63804	0.0062
ROE does not Granger Cause INTR		2.95789	0.0749
INF does not Granger Cause ROE	25	0.81969	0.4548
ROE does not Granger Cause INF		8.85650	0.0018
MSP does not Granger Cause ROE	25	6.63545	0.0062
ROE does not Granger Cause MSP		3.52919	0.0487
PER does not Granger Cause REER	25	2.95673	0.0750
REER does not Granger Cause PER		3.79915	0.0399
INTR does not Granger Cause REER	25	2.78495	0.0857
REER does not Granger Cause INTR		2.52690	0.1051
INF does not Granger Cause REER	25	3.58158	0.0468
REER does not Granger Cause INF		0.64444	0.5355
MSP does not Granger Cause REER	25	2.76512	0.0870
REER does not Granger Cause MSP		1.00001	0.3855
INTR does not Granger Cause PER	25	0.75496	0.4830
PER does not Granger Cause INTR		3.00417	0.0723
INF does not Granger Cause PER	25	0.30023	0.7439
PER does not Granger Cause INF		2.05895	0.1538
MSP does not Granger Cause PER	25	0.74948	0.4854
PER does not Granger Cause MSP		0.33877	0.7167
INF does not Granger Cause INTR	25	0.60496	0.5558
INTR does not Granger Cause INF		0.12105	0.8866
MSP does not Granger Cause INTR	25	0.15770	0.8552
INTR does not Granger Cause MSP		0.46930	0.6322
MSP does not Granger Cause INF	25	0.12208	0.8857
INF does not Granger Cause MSP		1.08790	0.3560

JOHANSEN CO INTEGRATION

Date: 12/02/17 Time: 04:10
 Sample (adjusted): 1991 2016
 Included observations: 26 after adjustments
 Trend assumption: Linear deterministic trend
 Series: ROE REER PER INTR INF MSP
 Lags interval (in first differences):

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.851317	111.9662	95.75366	0.0024
At most 1	0.643477	62.41173	69.81889	0.1689
At most 2	0.428389	35.59648	47.85613	0.4169
At most 3	0.402802	21.05478	29.79707	0.3542
At most 4	0.232283	7.651592	15.49471	0.5034
At most 5	0.029514	0.778919	3.841466	0.3775

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 *	0.851317	49.55445	40.07757	0.0032
At most 1	0.643477	26.81525	33.87687	0.2734
At most 2	0.428389	14.54170	27.58434	0.7835
At most 3	0.402802	13.40319	21.13162	0.4158
At most 4	0.232283	6.872673	14.26460	0.5043
At most 5	0.029514	0.778919	3.841466	0.3775

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):

ROE	REER	PER	INTR	INF
0.000117	-3.179585	-0.015709	0.004972	-0.010369
-0.000172	24.81845	-0.002029	-0.009409	0.011958
0.000250	10.39149	-0.011028	-1.29E-05	-0.054042
-0.000358	13.20515	0.011900	0.001582	0.090800
-0.000105	-3.630290	0.021986	0.002909	-0.006972
-0.000170	12.51623	0.003049	0.027230	0.015898

Unrestricted Adjustment Coefficients (alpha):

D(ROE)	D(REER)	PER	INTR	INF
-1161.400	-0.002297	382.8715	-153.5210	-287.0882
		-0.095266	0.031352	0.035190

D(PER)	1.695513	17.71689	2.885885	3.295560
D(INTR)	-18.99024	49.56848	272.3293	183.7264
D(INF)	-3.670176	-3.491241	4.900848	-3.546710
D(MSP)	21.69835	533.5217	69.12880	-37.96305

1 Cointegrating Equation(s): Log likelihood -793.8709

Normalized cointegrating coefficients (standard error in parentheses)

ROE	REER	PER	INTR	INF
1.000000	-27265.10 (20863.9)	-134.7059 (16.9638)	42.63162 (21.0186)	-88.91620 (33.7033)

Adjustment coefficients (standard error in parentheses)

D(ROE)	-0.135439 (0.02324)
D(REER)	-2.68E-07 (3.5E-06)
D(PER)	0.000198 (0.00074)
D(INTR)	-0.002215 (0.02371)
D(INF)	-0.000428 (0.00026)
D(MSP)	0.002530 (0.02641)

2 Cointegrating Equation(s): Log likelihood -780.4632

Normalized cointegrating coefficients (standard error in parentheses)

ROE	REER	PER	INTR	INF
1.000000	0.000000	-168.7999 (18.1618)	39.81066 (26.5756)	-93.41373 (40.5683)
0.000000	1.000000	-0.001250 (0.00019)	-0.000103 (0.00028)	-0.000165 (0.00043)

Adjustment coefficients (standard error in parentheses)

D(ROE)	-0.201230 (0.03807)	13195.04 (4586.54)
D(REER)	1.61E-05 (4.7E-06)	-2.357039 (0.56562)
D(PER)	-0.002847 (0.00109)	434.3146 (131.278)
D(INTR)	-0.010732 (0.04218)	1290.594 (5081.69)
D(INF)	0.000172 (0.00045)	-74.97755 (53.7137)
D(MSP)	-0.089148 (0.04125)	13172.19 (4969.48)

3 Cointegrating Equation(s): Log likelihood -773.1924

Normalized cointegrating coefficients (standard error in parentheses)

ROE	REER	PER	INTR	INF
1.000000	0.000000	0.000000	5.833642	-204.1994

0.000000	1.000000	0.000000	(27.8191)	(31.2181)
			-0.000355	-0.000986
			(0.00023)	(0.00026)
0.000000	0.000000	1.000000	-0.201286	-0.656314
			(0.25721)	(0.28864)

Adjustment coefficients (standard error in parentheses)

D(ROE)	-0.239601	11599.73	19.16073
	(0.05869)	(4893.24)	(3.48576)
D(REER)	2.39E-05	-2.031248	-0.000116
	(7.0E-06)	(0.58740)	(0.00042)
D(PER)	-0.002125	464.3033	-0.094403
	(0.00169)	(141.251)	(0.10062)
D(INTR)	0.057333	4120.501	-2.805419
	(0.06348)	(5292.38)	(3.77010)
D(INF)	0.001397	-24.05043	0.010693
	(0.00062)	(51.4605)	(0.03666)
D(MSP)	-0.071870	13890.54	-2.185577
	(0.06438)	(5367.41)	(3.82355)

4 Cointegrating Equation(s): Log likelihood -766.4908

Normalized cointegrating coefficients (standard error in parentheses)

ROE	REER	PER	INTR	INF
1.000000	0.000000	0.000000	0.000000	-225.0795
				(27.0287)
0.000000	1.000000	0.000000	0.000000	0.000286
				(0.00046)
0.000000	0.000000	1.000000	0.000000	0.064141
				(0.38605)
0.000000	0.000000	0.000000	1.000000	3.579260
				(0.93221)

Adjustment coefficients (standard error in parentheses)

D(ROE)	-0.136789	7808.689	15.74450	-9.828379
	(0.08261)	(5148.99)	(3.87348)	(1.83790)
D(REER)	1.13E-05	-1.566555	0.000302	0.000940
	(9.9E-06)	(0.61655)	(0.00046)	(0.00022)
D(PER)	-0.003306	507.8216	-0.055187	-0.153089
	(0.00250)	(155.821)	(0.11722)	(0.05562)
D(INTR)	-0.008463	6546.636	-0.619152	-0.273740
	(0.09270)	(5778.00)	(4.34668)	(2.06243)
D(INF)	0.002667	-70.88528	-0.031512	0.008929
	(0.00085)	(52.9258)	(0.03982)	(0.01889)
D(MSP)	-0.058274	13389.23	-2.637321	-4.972805
	(0.09573)	(5966.43)	(4.48843)	(2.12968)

5 Cointegrating Equation(s): Log likelihood -763.0545

Normalized cointegrating coefficients (standard error in parentheses)

ROE	REER	PER	INTR	INF
1.000000	0.000000	0.000000	0.000000	0.000000
0.000000	1.000000	0.000000	0.000000	0.000000

0.000000	0.000000	1.000000	0.000000	0.000000
0.000000	0.000000	0.000000	1.000000	0.000000
0.000000	0.000000	0.000000	0.000000	1.000000

Adjustment coefficients (standard error in parentheses)

D(ROE)	-0.125890 (0.08389)	8184.748 (5146.32)	13.46703 (5.35395)	-10.12968 (1.88925)
D(REER)	1.02E-05 (1.0E-05)	-1.606241 (0.61730)	0.000543 (0.00064)	0.000972 (0.00023)
D(PER)	-0.002669 (0.00248)	529.7715 (152.410)	-0.188119 (0.15856)	-0.170675 (0.05595)
D(INTR)	-0.050597 (0.08582)	5092.839 (5264.16)	8.185262 (5.47655)	0.891062 (1.93251)
D(INF)	0.002660 (0.00087)	-71.11276 (53.3069)	-0.030134 (0.05546)	0.009111 (0.01957)
D(MSP)	-0.102034 (0.08850)	11879.33 (5428.81)	6.506892 (5.64783)	-3.763048 (1.99295)
