THE REAL EXCHANGE RATE INSTABILITY: THE NIGERIAN EXPERIENCE (1973-1996)

BY

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DECLARATION

I EL-RASHEED Shehu, declare that to the best of my knowledge, the data contained in this thesis is from original research, and the thesis has not been presented to any other University for examination.

All references in this work have also been duly acknowledged.

12/12/2000

EL-RASHEED SHEHU

DEDICATION

To Alh. Abdulkadir Rashid, and my mummy Malama Fatsuma Abubakar S. with love.

CERTIFICATION

This thesis entitled "The Real Exchange Rate Instability: The Nigerian Experience 1973-1996" by El-Rasheed Shehu meet the regulations governing the award of the Degree of Master of Science (M.Sc) in Economics of Ahmadu Bello University, Zaria and is approved for its contribution to knowledge and literary presentation.

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ABSTRACT

The study undertakes an analysis of the causes of fluctuations in Nigeria's Real exchange rate over the period 1973-96. The study period was divided into two sub periods 1973-86, and 1986-96 and the real exchange rate instability indices for the two periods were calculated using coefficient of variation method. The result shows a greater degree of instability in real exchange rate over the period 1973-86 than the later period, 1986-96. This signifies that the period 1973-86 had more inconsistencies in macroeconomic, trade, and exchange rate policies. Also, using a simple regression model and Granger causality test, explanatory variables reflecting Nigeria's real exchange rate changes were statistically investigated. The estimated regression equation reveals that fluctuations in the terms of trade and nominal exchange rate changes were the major causes of Real exchange rate instability in Nigeria over the period of study. Domestic monetary and fiscal policies contributed to a lesser extend to the volatility in real exchange rate.

The study reveals a unidirectional causal link from Terms of trade to Real exchange rate without a feed back effect. There existed also a negative causal relationship from net capital inflow, growth in money stock, federal government fiscal deficit, and the degree of openness to Real exchange rate, which signifies a depreciating effect of the variables on Real exchange rate.

Suggestive measures from the analysis therefore are policies which aim at stabilizing the terms of trade. This can be done by balancing the Nigeria's external accounts. The study advocates an exchange rate management policy following the purchasing power parity approach targeted at non-inflationary fiscal and monetary policies which will help in achieving both internal and external balance. Also to have a strong realistic and stable exchange rate a unified exchange rate system is recommended.

There should be a restraint in the growth in money stock combine with prudent fiscal operations.

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CHAPTER ONE

INTRODUCTION

1.0 BACKGROUND TO THE STUDY

The overall poor economic performance of less developed countries (LDCs) has been mostly attributed to the lack of enabling environment to encourage economic agents to invest and produce efficiently. The incentive structure does not promote efficiency in the utilization of resources. The macroeconomic policy mix led to the over-valuation of the real exchange rate which discourage export production and diversification and made imports artificially cheap (Lipumba, 1992).

The exchange rate is a price of one currency in terms of other currencies. It places a value on a unit of domestic currency of a particular country in relation to the currency of its trading partners (Dornbush, 1988). when applied in conjunction with other macroeconomic policies, the exchange rate is expected to lead to the achievement of the goals of price stability, improved and sustained economic growth, reduced unemployment and promote balance of payments stability. An optimal and stable exchange rate system would help in achieving these macroeconomic objectives. Like other economic variables such as interest rate, inflation rate, unemployment rate, money supply et cetra, exchange rate is a strong economic indicator for assessing the overall performance of an economy. It is one of the macro-economic

variables that reflects the strength or weakness of an economy. (Dornbush. 1988).

The exchange rate previously defined reflects the nominal exchange rate (NER) which is the exchange rate as generally understood and quoted in the foreign exchange market. Real exchange rate (RER) the domestic NER adjusted for changes in price level differential between the domestic economy and the rest of the world is of higher significance than the NER because the RER does not only reflect general economic performance and international competitiveness, but also the different sectors of the economy as well as foreign trade flows and balance of payments, internal debt crisis domestic production and consumption, and resource allocation in the economy. A sustained misalignment of RER in terms of overvaluation or undervaluation is taken to be a major source of macro-economic disequilibrium (Krumm, 1993). The degree of RER fluctuations in Nigeria shown by the appreciation/depreciation level of the RER has over the years been an issue of serious concern. The extent of naira RER appreciation/depreciation was given as-4.3,-7.6, 29.4 and-15.0 percent in 1980, 1982, 1984, and 1985 respectively (Obadan, 1994). These were years preceeding the introduction of Structural Adjustment Programme (SAP) in Nigeria. The RER depreciated to 68.25 percent in 1986 with the adoption of Second-tier Foreign Exchange Market (SFEM) under the auspices of SAP (Olisadebe 1991).

The RER has kept fluctuating since 1986, appreciating in some years and depreciating in other years. The degree of and the implication of the fluctuations in the RER in a typical developing country like Nigeria requires serious investigation because monetary stability is crucial to a country's financial well being and to its economic relationships with other countries. A major concern that has been worrying the government of Nigeria has been that of determining how to stabilize the highly fluctuating exchange rates so that her foreign trade, foreign and domestic investment and other macroeconomic variables will stabilize so as to achieve an acceptable level of economic growth and development. Various efforts have been made by government policy makers to stabilize the naira exchange rates.

This study is an attempt to empirically investigate the causes of RER instability in Nigeria over the period 1973-1996.

1.1 STATEMENT OF THE PROBLEM

Real exchange rate in Nigeria have continued to be viewed as a matter of national and international concern. A stable system of exchange rate is seen as dependent on stable macroeconomic policies at the national level. The poor economic performance in the last few years shows that the exchange rate system has had serious problems. The most critical one has been that the RER movements (i.e NER changes

adjusted for inflation differences across countries) have gone far beyond those suggested by theories. Such maladjustments have created a major problem. It has prevented efficient allocation of resources. Large RER changes of over 30 percent over the medium term adversely affected the pattern of production, employment investment and consumption within Nigeria.

It is often argued that RER instability has adverse effects on growth, because it creates uncertainty (which reduces investment) causes resources to move back and forth between tradable and non-tradables and more generally generate unnecessary adjustment costs (Killick, 1988). The implication is that instability is not predictable thereby causing distortions in both private and public sectors planning decisions. With regard to the problem of RER instability in Nigeria the following questions were considered significant for this study.

1. What are the factors causing RER instability in Nigeria?
2. What are the effects of RER instability?
3. How effective are the Nigeria's exchange rate policies in eliminating or reducing the persistent RER instability in Nigeria?

This study is an attempt to address these and other related questions on the RER instability in Nigeria.

1.2 OBJECTIVES OF THE STUDY

The thesis is aimed at achieving the following objectives.

a) To calculate the RER instability indices for the two periods 1973-1985 and 1986-1996.

b) To carry out an empirical investigation into the causes of RER instability in Nigeria.

c) To conduct a causality test so as to find the direction of causality, if there is any between RER and each of terms of trade, capital inflows, money supply, degree of openness, nominal exchange rate changes, and federal government fiscal deficit.

d) Review exchange rate policies in Nigeria and their efficacy in solving the problem of RER instability.

e) Make appropriate policy recommendations based on the findings.

1.3 RESEARCH HYPOTHESES

The following hypotheses which are derived directly from the objectives of the study will be examined.

i) that RER instability is mainly caused by terms of trade, capital inflows, growth in money supply, nominal exchange rate movements, degree of openness, and federal government fiscal deficit.

ii) That there is a uni-directional causal relationship

supply; nominal devaluation; degree of openness; and federal government fiscal deficit, and RER.

1.4 JUSTIFICATION OF THE STUDY

An understanding of exchange rate behaviour has reached an important position in recent years because of the role international trade and foreign investment play in accelerating economic growth in some nations.

In Nigeria, despite various efforts made by both the monetary authorities and researchers to solve the problem of RER instability the problem failed to respond to policy prescriptions. This may be due either to wrong policy application or failure to identify the main causes of the problem. It should be emphasized here that unless the Nigeria's exchange rate policy is studied carefully and tested on both theoretical and empirical grounds any suggestion or proposal for the solution of Nigeria's economic problems may be ineffective. Although there is much interest on the RER instability and its impact on the economy there is limited empirical evidence on the causes and measures of RER instability in Nigeria. This then makes a study of this nature a very useful contribution to the existing knowledge. The study attempts to carry out an empirical investigation into the factors responsible for the persistent naira real exchange rate instability over the years.

1.5 METHODOLOGY

TYPE OF DATA REQUIRED

Published data on exchange rates, Terms of trade, capital inflows, money supply, federal government fiscal deficit, and other related macroeconomic variables as specified in the model were used.

SOURCES OF DATA

The data employed in this research work were time series data of the relevant variables, and the data were mainly secondary in terms of their source. Information was gathered from Central Bank of Nigeria (CBN) Publications; Statistical Bulletins, Bullions, Annual Reports and Statements of Accounts, Briefs, Economic and Financial Reviews. Added to these sources were information and data gathered from textbooks, seminar papers, articles, International Monetary Fund (IMF) and world Bank Publications.

TECHNIQUE OF DATA ANALYSIS

Descriptive and analytical methods were applied to analyze the factors that cause RER variability in Nigeria. The analytical method made use of the Ordinary Least Square (OLS) method using a simple econometric model.

This study also adopted the use of Granger technique to test for the causal linkage between RER and each of-terms of

trade, capital inflows, money supply, nominal exchange rate, degree of openness and federal government fiscal deficit.
We used coefficient of variation in calculating the RER instability indices for the period 1973-1985 and 1986-1996. The period of the study could not be extended because some of the variables like, net capital inflow had data only up to 1996 as at the time of investigation.

1.6 SCOPE AND LIMITATION

The work covered the period 1973-1996. This period is wide enough to permit good deductions that may influence or redirect policy decisions in Nigeria. In 1973, following the decimalization and change of the Nigerian currency from the pound to the naira, an active exchange rate policy was adopted. This then served as a basis for a study of this nature. The period of the study has been broken down into the pre-reform and Reform period. This then made any logical deduction possible on the impact of the RER policies adopted prior and during SAP and after SAP period in stabilizing the RER in Nigeria. The SAP introduced in Nigeria in 1986 was seen as a revolution in Nigeria's economic policy formulation. A common problem associated to a research of this nature is the availability and accessibility of statistical data. Where the data is available, its reliability tends to be questionable. Nevertheless this study has made use of the available published data from the official sources.

The results should be taken with caution.

1.7 PLAN OF THE STUDY

The work is structured into five chapters. Chapter one is the introduction and it contains the statement of the problem, objectives of the study, research hypothesis, justification of the study methodology and limitations. Chapter two reviewed and appraised the related literature on the research area. It discussed the concepts of nominal and Real exchange rates, the equilibrium real exchange rate and the significance of RER. It also discussed the effects of exchange rates overvaluation. Under theoretical framework, the chapter also reviewed various exchange rate behaviour models and fixed and floating/flexible exchange system. It also reviewed and appraised empirical literature on the study area.

Chapter three reviewed Nigeria's exchange rate policies and their effectiveness towards stabilizing the naira real exchange rate. It also discussed the effect of RER changes on Nigeria's trade balance over the period of study. It examined the trends of the RER instability and calculated the RER instability indices for the period 1973-1985 and 1986-96.

Chapter four contained the model specification and the discussion of the regression results. It analysed the results and interpreted both the OLS regression model and the causality test.

Chapter five contained the summary, conclusion and policy recommendations.

CHAPTER TWO

REVIEW OF LITERATURE

2.0 INTRODUCTION

There have been serious controversies among economists and policy makers as regards the determinants of real exchange rates and the causes and effects of the exchange rates movements. This chapter reviewed various exchange rate determination theories with an emphasis on the purchasing power parity theory which serves as the background for this study. The subsequent sections discussed the concepts of nominal and real exchange rates, equilibrium RER, significance of RER and the effects of overvalued exchange rate. It further reviewed exchange rate models and fixed and floating/flexible exchange rate system. The chapter finally appraised the empirical studies on the area of study.

2.1 CONCEPTS OF NOMINAL AND REAL EXCHANGE RATES

Nominal exchange rate is the exchange rate that is common and familiar to everyone. It is simply the relative price of two monies, i.e the price of domestic currency in terms of foreign currency as being quoted in the FOREX market. In general terms, it represents the number of units of domestic currency that exchange for a unit of foreign currency. In Nigeria, the naira exchange rate represents the units of domestic currency (naira) that exchange for one unit

of a foreign currency (U.S. dollar for instance). NER assumes relevance largely because of the Cross-border flow of commodity and financial assets. It connects the price systems in different countries thereby allowing international traders to compare prices directly (Kindleberger, 1983).

Just like the commodity market, where price is determined by the forces of demand and supply, exchange rate is primarily determined by the supply and demand for foreign currency. The higher the demand for foreign currency, the more will its price rise which is the samething as a fall in value of the units of domestic currency. The demand for foreign currency is represented by imports of goods and services. While the supply of foreign currency is largely represented by receipts from the export of goods and services which reflects the demand by foreigners for domestic goods and services. Any shortage in supply could be augmented by loans and transfers from abroad. The supply of foreign currency is thus a function of that part of domestic output which is exported as well as its price. The demand for FOREX depends on price as well as the level of income and liquidity among other factors (CBN, 1997).

Real exchange rate (RER) is defined as the nominal exchange rate deflated by the relative inflation rates between the domestic country and its trading partners (Dornbush, 1988). Alternatively, it is viewed as the price of tradable goods divided by the price of non-tradable goods. It measures

the cost of domestically producing traded goods in terms of non traded goods. Tradable goods are those that enters the world market at prices largely determined by the market. Traded goods will include not only all imports and exports, but also goods that can be exported and are domestically consumed as well as import substitutes. While non-tradable goods are those goods that cannot be traded internationally and for most countries include services such as personal services, domestic transport and housing (Helmers, 1988). As the ratio of price of tradables to the price of non-tradables, RER can be expressed as;

$$RER = E_t \times \frac{P_T}{P_N}$$

Where;

RER = Real exchange rate

E_t = Nominal exchange rate in current period.

P_t = Price of domestic tradables in current year.

P_N = Price of non-tradables in current period.

The consumer price index (C.P.I) is used as a proxy for the domestic tradables so that the international price competitiveness is measured as relative movements in CPI measured in the common currency. In countries where statistical coverage and sophistication are high, the wholesale price index (WPI), i.e the domestic and foreign unit labour costs deflated by a common currency are used. In most developing countries, including Nigeria, the CPI is used as a

proxy due to lack of other price indices.

RER assumes importance because of the need to work in real terms to put the analysis of trade and current account movements on the same basis as the analysis of real supply, real demand and real price of a single commodity. This is because if export revenue increases in nominal terms just as much as the cost of producing the exports, for instance, then nothing has changed in real terms, though substantial changes may have occured in nominal terms. RER, measured as the ratio of price of tradable to the price of non-tradable measured the cost of domestically producing traded goods in terms of non-traded goods.

An exchange rate between the domestic country and any other nation is referred to as bilateral exchange rate. An effective exchange rate, on the other hand, is expressed usually as a weighted average of the most important bilateral rates (Killick 1988). In exchange rate analysis, effective exchange rates are always used. The advantage of using effective exchange rate is that it smooths out most of the movements caused by fluctuations in the value of whatever foreign currency enters into a bilateral rate. Since a country trades with more than one nation, it then becomes imperative to use effective exchange rates. Because of the pitfalls of using a single bilateral rate, an increasing number of countries now define their official exchange rate in

terms of a basket of currencies (Dornbush, 1993). Also, exchange rate can be expressed either as the price of domestic currency in terms of foreign currency (naira/dollar for instance)or the price of foreign currency in terms of domestic currency (Dollar/naira for instance). Authors and researchers use the two different approaches in analysis. It does not matter which of the two approaches is used so long as the measure is well defined and consistent (Dornbush, 1988). Unless otherwise stated, this study used the first definition (i.e. price of domestic currency, Naira interms of foreign currency) in its analysis.

2.2 THE CONCEPT OF EQUILIBRIUM REAL EXCHANGE RATE

In general terms, the equilibrium exchange rate can be defined as that rate that will result in the simultaneous achievement of internal and external equilibrium in the medium and long-run (Sodersten, 1980). Internal equilibrium implies full employment of domestic resources without excessive demand that will cause inflation. External equilibrium relates to the balance of payments position. The current account balance should be compatible with medium and long-term capital flows and reasonable foreign exchange reserves to finance normal current account transactions.

The concept of equilibrium RER is a medium/long-run one also. The long-run equilibrium RER is the rate which ensures that

the current account balance (current and future) is compatible with long-run sustainable capital flows for external equilibrium and that the non-tradable goods market clears with employment at its natural level for internal equilibrium (Krumm 1993). In a more simplified manner, and within the context of tradable and non-tradable goods, the equilibrium RER is the relative price which results in the simultaneous attainment of equilibrium in the external sector and in the domestic economy. The appropriate or equilibrium RER is that price of tradable relative to non-tradable that will ensure full employment of domestic resources and balance of payments equilibrium in the medium and long-run, given sustainable values of other relevant variables including trade taxes, terms of trade, capital and aid flows, technology and technical progress (Lipumba, 1992).

The appropriate RER that will attain the objective of internal and external equilibrium with reasonable growth is obviously not a single number that does not change over time. Changes in any other variable that influence the internal and external balance will influence the appropriate RER. For instance, a permanent fall in the terms of trade will change the appropriate RER that is necessary to attain internal and external balance. A depreciation of the RER will be necessary to increase export value and diversify production into new export lines. Fast technical progress in the traded sector is likely to lead to an appreciation of the appropriate RER.

RER is being determined generally by both external and domestic fundamentals (Edwards, 1994). The external fundamentals include terms of trade, capital inflows and world market real interest rates. The domestic fundamentals are trade or commercial policy (import tariffs, import quotas and export taxes), nominal exchange rate, and the composition and level of government expenditure. The influence of each of these factor on RER are discussed in the empirical analysis in chapter four.

2.3 SIGNIFICANCE OF REAL EXCHANGE RATE

The RER is a relative price that summarizes the degree of competitiveness of external sector of a country for both exports and import substitutes (Dornbush, 1988). It measures the international competitiveness of a nation in relation to its trading partners. It is used as an indicator of the need for devaluation/depreciation of a country's currency. An appreciation in the RER may signify that a country may soon experience current account difficulties (Killick, 1989). Prior to the adoption of SAP Exchange rate policy reforms, overvaluation of exchange rates was regarded as a serious problem facing many less developed countries (the subsequent section discusses the effects of an overvalued exchange rate). The RER affects the allocation of resources in an economy. An increase in RER will make home goods more expensive and will encourage consumers to substitute the less expensive

traded goods for home goods. Relative prices do affect household spending patterns. Consumers reallocate their budget and buy more of those goods that have become cheaper. Put differently, an increase in the RER (real appreciation) or an increase in the price of traded goods (exportable and importable) switches domestic demand from the traded goods to non-traded goods. This is due to the fact that as the RER rises, imports as well as export goods sold in the domestic market become more expensive. The reduced demand for those goods will be switched to import substitutes/import competing goods and non-traded goods because both are relatively cheap. Also exports will increase because they become more profitable as a result of higher local currency prices. The net effect is a reduction in the demand by residents for foreign produced goods and an increase in demand by residents as well as foreign consumers for domestically produced goods (Obadan, 1994).

In terms of international competitiveness, a decline in RER representing a real appreciation reflects an increase in the domestic cost of producing tradable goods. If there are no changes in the relative price of a country's trading partners, the decline in RER represents a deterioration of the country's international competitiveness. On the other hand, an increase in the relative prices of tradable or a rise in RER representing a real depreciation shows an improvement in international competitiveness.

In developing countries, the RER has received considerable attention as a key component of promoting export growth and avoiding destabilizing capital flight (Derick, 1996).

2.4 EFFECTS OF EXCHANGE RATE OVERVALUATION ON AN ECONOMY

Overvaluation of a currency results when the currency assumes a higher value in relation to other currencies (Killick, 1988). Thus if the naira is 60 percent overvalued against the U.S. dollar, it then means that the naira assumes a value which is 60 percent higher than its realistic value against the U.S dollar. Overvaluation is deliberate when the government allows the value of its exchange rate to appreciate to maximize growth and development. It could also arise from domestic inflation if the value is not adjusted. Overvaluation has the following consequences on an economy; It brings about disequilibrium or distortion in the economy. It discourages local production and encourages importation as imports become relatively cheaper, this is because the local currency cost of importation will be kept artificially low. It discourages export by reducing the profitability of producing for world markets. It places such a country at a disadvantaged position competitively, because it makes the prices of her exports relatively dearer in the international market. Killick (1993). argued that the combined effect of increasing importation and dwindling exports exerts pressure

on the balance of payments and the economy at large. Overvaluation is also associated with high administrative costs. Since there will be an excess demand for the overvalued currency quantitative control has to be adopted in order to ration the available FOREX. Import licenses were the system adopted in Nigeria. Such controls do not only involve cost but it also has inefficiency in the allocation of scarce resources. It is further argued that such resource allocation leads to smuggling. This in turn reduces the revenue accruable to the government. In Nigeria for instance, cocoa and other commodities were smuggled out to the neighbouring countries for exportation. It was also argued that black marketing in FOREX is due to overvaluation and control which encourages the smuggling of foreign goods.

Overvaluation causes distortion in the economy thereby shifting resources from productive activities to non-productive activities. The holders of import Licenses become the masters of the day. This encourages distributive trade against production. Abdullahi (1987) has this to say about overvaluation and quantitative control;

... "These policies resulted in heightened smuggling of currency and goods, capital flight, stagnation of the non-oil sector, loss of foreign exchange earnings from the official and unofficial sources, corruption, windfall profits by recipients of import licenses, gross misallocation of scarce resources and increased dependence on external sources".

Overvaluation is also liable to destabilize capital movements and to be associated with an external debt problem. This will occur partly through the weakening in the balance of payments as earlier stated; the larger the current deficit to be financed the greater the need to borrow abroad. This may be aggravated by capital flight. When a currency is overvalued, those who can do so have the maximum incentive to move their capital out of the country while it will still buy relatively large amounts of FOREX. By the same token, incentives will be reduced for foreigners to invest in the domestic economy so long as they think that a large devaluation may occur at future time. This will contribute to an unstable macroeconomic environment that is detrimental to enterprise investment, and price responsiveness (Killick, 1993).

2.5 MODELS OF EXCHANGE RATE BEHAVIOUR

The Traditional Flow Model

This theory is basically drawn from the principle of market mechanism , i.e. the forces of demand and supply. Exchange rate simply is determined by the interplay of the market forces in the FOREX market. Conventionally, an equilibrium rate will be reached when there is neither excess demand nor excess supply in the market (Dornbush 1988). In other words, in a very short term assuming no speculation, the exchange rates are dependent upon supply and demand of FOREX available in the market. The supply-demand conditions are

derived from two sectors-private and official. Official sector normally works under pegged system while private sector serves as the major source for a perfectly flexible rate system (Hyung, 1972).

The excess private demand for FOREX denoted by Do, for instance, in any short market period depends upon the balance of trade and long-term capital flows denoted by C, the international short term interest rate differentials, symbolized as id, the price of spot FOREX (X) and the expected future price of FOREX (Xe). With this a model of the FOREX market can be constructed and expressed in equation form as;

$$D_o = F(C, id, X_1, X_e) \quad \ldots\ldots\ldots\ldots\ldots\ldots \quad (1)$$

Another form is to make the monetary authority's excess demand for FOREX (D_1) an exogenous variable. The model was expressed by Helliwell, 1967 as;

$$D_1 = \mu \quad \ldots\ldots\ldots\ldots\ldots \quad (2)$$

Where,

μ = An exogenous variable. Both equations are then combined into an equation where;

$$D_o + D_1 = 0 \quad \ldots\ldots\ldots\ldots\ldots\ldots \quad (3)$$

Equation 3, which is the market clearing condition, can be used to remove D_o and D_1 to determine the exchange rate as our implicit endogenous variable. Thus;

$$F_o (C, id, X_1, X_e) + W = 0 \quad \ldots\ldots\ldots\ldots\ldots \quad (4)$$

The model might appropriately describe a flexible exchange rate system if the monetary authorities either

refrained from entering the market or they purchased and sold FOREX in amounts unrelented to the current demand and supply requirements of all other participants in the FOREX market (Hyung 1972). This then signifies that the exchange rate is in equilibrium when supply equals demand. A surplus in current account is financed through financial assets acquisition abroad or by an outflow of capital. Conversely a deficit is financed by an inflow of capital. The current account is assumed to be determined by changes in relative prices and real income. Increases in domestic price level feed into costs thereby making exports costly and highly uncompetitive. Consequently, the supply of FOREX is constrained. Imports on the other hand, increase since the inflation ridden economy is a more profitable place to export to. According to Helliwell, (1967) increases in real income causes exchange rate to depreciate because such increases tend to increase demand for imports with a negative impact on the current account but with no off setting increase in capital inflow. The model further stresses that an increase in domestic interest rate causes an appreciation of the exchange rate through induced capital inflow.

The basic criticisms laid against this model is that it ignores the relevance of the asset market in capital inflows.

The Balance of Payments Theory

In this theory, balance of payments could be used as a barometer of the forces of demand for and supply of FOREX in the market. On a specific term the current account balance is often considered to be a measure of these forces. Since exchange rate measures the price per unit of one currency to another, the demand and supply functions of FOREX determine each country's currency price in the market. A state of disequilibrium between the two occurs due to the imbalance of the international balance of payments conditions. This theory was first propounded by Goschem George (1962). Egon (1963) made these comments about the theory;

> "The ratios at which a currency exchanges against others on the foreign exchange market are of decisive importance for the various components of a country's balance of payments with the outside world. The balance of payment is a systematic arrangement of all transactions that give rise to a change of demand or supply of a currency".

In its naive from the balance of payments theory merely asserts that exchange rates are determined by the balance of payments conditions of each country in the sense of supply and demand.

Monetarist Model

This model is a direct out-growth of the Purchasing

Power Parity Theory and of the Quantity Theory of Money (Mussa and Frankel 1973). While the PPP theory holds that exchange rate is the relative price of goods, in the two countries, monetarist model argues that exchange rate is a relative price of two monies. Thus the monetarist model posits that assuming a neutrality of money, exchange rate behaviour reflects the evolution of the relative demand for two monies. According to the model, exchange rate between two currencies is determined by the relative supply of and demand for money between the two countries. According to Mussa,and Frenkel (1972) an increase in money supply causes the exchange rate to depreciate as a result of inflationary pressures so generated. An increase in domestic interest rate lowers money demand, raises prices (with a given money stock). The increase in prices leads to the depreciation of the exchange rate.

Despite the fact that both traditional flow and monetary models specify same factors as affecting the exchange rate, the results are in the opposite direction. The traditional flow model predicts that increase in real income and interest rate lead to exchange rate appreciation (Ward 1967). This is against the monetarist view that they cause the exchange rate to depreciate (Frankel, 1969). Monetarist model of exchange rate behaviour was developed by exchange rate economists such as Frankel, Mussa, Girton, Roper, Hodrick and Bilson.

Portfolio - Balance Model

This theory is an extension of the monetarist model. Unlike the monetarist model that assumes only currencies as its assets, this model has three forms of assets. These assets are monetary base, domestic and foreign bonds. The assets are assumed to be imperfect substitutes of each other and among various nations. The exchange rate is in equilibrium, when the holdings of these assets are in their desired proportion. (Helliwell, 1967). An increase in domestic wealth may arise either from increases in monetary base, holdings of government bonds or from the current account surplus. An increase in wealth increases the demand for foreign bonds or assets leading to a depreciation of the exchange rate as a result of capital outflow so generated. However according to Hyung, (1972) an increase in private sector holdings of government bonds (i.e an increase in domestic government debt) drives bond prices down and raises interest rate. This causes an appreciation of the exchange rate. An increase in domestic government bonds has an uncertain effect on the exchange rate. The exchange rate may appreciate or depreciate, depending on the relative strengths of the substitution and income effects. The exchange rate will appreciate if the substitution effect is stronger. Conversely, it will depreciate if it is weaker than the income effect (Olisadebe, 1992). The proponents of this theory ignores the fundamental determinants of trade, role of

expectations as well as the role of purchasing power parity.

Purchasing Power parity Theory

The modern origin of the purchasing power parity (PPP) theory traced to the debate on how to restore the world financial system after its collapse during world war 1. In an attempt to solve the after war problem of how to reset exchange rates with minimal disruption to prices and government finances, a Swedish economist Gustav Cassel promoted the use of PPP as a means of setting relative gold parities. Though PPP had been discussed previously by classical economists such as J.S. Mill, Viscount Goschem, Alfred Marshal and Ludwig Von mises, Cassel was really the first to treat PPP as a practical empirical theory (Rogoff 1976).

Professor Cassel's assertion forms the popular basis for determining relative values of paper currencies. The PPP doctrine came into extensive use during the various discussions of exchange rate policy which took place in the late twenties and early thirties. The balance of payments theory which was the most popular theory prior to the first world war lost its position to PPP theory. This was due to the fact that exchange rates of many countries showed a great deal of fluctuations, irrespective of the impact of supply and demand upon international reserves. Thus the PPP theory appeared as a new base to explain the exchange rate

determination mechanism.

The major aspects of the theory may best be summed up by the following passage from Cassel (1922) as quoted by Hyung (1972);

> "Our willingness to pay a certain price for foreign money must ultimately and essentially be due to the fact that this money possesses purchasing power as against commodities and services in that foreign currencies ..... our valuation of a foreign currency in terms of our own therefore, mainly depends on the relative purchasing power of the two currencies in their respective countries ..... when the two currencies have undergone inflation, the normal rate of exchange will be equal to the old rate multiplied by the quotient of the degree of inflation in the one country and in the other ..... That rate that has been calculated by the above method must be regarded as the new parity between the currencies, the point of balance towards which inspite of all temporary fluctuations, the exchange rates will always tend. This parity I call purchasing power parity".

From this passage, it is clearly stated that the equilibrium exchange rate between two nation's currencies is determined by or tends to be equal to the ratio of the internal purchasing power of the two currencies in the respective countries. The PPP theory tends to explain equilibrium exchange rate in terms of inflationary differential between two nations. It assumes that exchange rate of currencies of two nations move in a manner that seeks to offset the inflation differential between the economies thereby maintaining the real purchasing power of either currency in the other economy. In practical terms according

to Hyung (1972), the PPP theory pre-supposes a comparison of relative inflation rates among different countries. In its simplest version, if we think of only one product, PPP says that the price of a product (ignoring costs such as transportation and local taxes) should be the same regardless of the country where it is purchased. The PPP doctrine according to Goschem (1962) has two forms. The absolute and relative versions. The absolute aspect deals with the determination of the rate at a given point in time, while the relative version refers to movements relative to some previous date. In other words, the absolute PPP is the ratio of domestic prices (P^d) to world prices or prices of major trading partners (P^f). Thus,

$$PPP_A = \frac{Pd}{Pf} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (5)$$

While the relative PPP is the absolute PPP multiplied by the base period exchange rate (E_o) in the domestic economy. Thus:

$$PPP_R = E_o \times \frac{Pd}{Pf} \quad \ldots\ldots\ldots\ldots\ldots\ldots \quad (6)$$

or

$$PPP_R = E_o \times PPP_A \quad \ldots\ldots\ldots\ldots\ldots\ldots \quad (7)$$

For policy purposes, the relative PPP is often applied due to the inherent short coming of the absolute PPP (Obaseki, 1997). It is argued that in the short-term, the exchange rates of two currencies may fluctuate depending on market

conditions, and in the long run the exchange rate's tends towards purchasing power parity (CBN, 1997).

The PPP theory has been one of the most useful building blocks in exchange rate determination especially in flexible exchange regimes. However, there has been a continued debate on whether the PPP theory holds in the short-run, long-run or not at all. In the 1920s, during the brief period of floating regimes, estimates have validated the short-run PPP (Olisadebe, 1991). While the PPP theory is not supported by most empirical in the short-run the issue of long-run PPP remains largely unsettled. Early studies by Roll (1979), Frenkel (1981), Adler and Lehman (1983) and Mark (1990) indicated that the RER follows random walks, and as such its impact cannot be mean-reverting. It implies that the long-run PPP hypothesis may not hold. Besides the presence of non-traded goods, transportation costs, trade restrictions and imperfect competition can certainly weaken the result of the long-run PPP. As such, the determination of the empirical validity of the constancy of the long-run equilibrium PPP continues. Under these circumstances of conflicting results, policy makers and researchers must closely look at the factors that causes the exchange rates to deviate from both its short run and long-run equilibrium value.

Even though a lot of criticisms have been laid down on the applicability of PPP theory, It provides a very vital theoretical foundation. Keyness himself makes a concluding

remarks in his book, A Tract on Monetary Reforms that;

> "Purchasing power parity theory even in its crude form has worked passably well. (Keynes, 1924).

For that, PPP theory has been adopted in many researches as the basis for evaluating a country's exchange rate behaviour.

2.6 FIXED AND FLOATING EXCHANGE RATE SYSTEMS

Since exchange rate is a price, the important consideration is the mechanism for its determination. The mechanism through which exchange rate is determined reflects the exchange rate policy of any economy. In the theoretical literature, there are two major mechanisms for exchange rate determination. The distinguishing feature between the two is institutional which explains why the mechanisms correspond to the two major economic institutions in real economies i.e. the government and the market (Odubogun, 1995). Where the authorities of a country fix the rate at which the domestic currency will exchange for the foreign currency is regarded as fixed exchange or exchange control system. Fixed exchange rate is used in a period of highly unstable and varying inflation and price liberalization. Fixed rates reduce inflationary pressures by keeping the growth of nominal variable under control (Gasper, 1997).

The proponents of fixed exchange system further argued that by applying fixed exchange rates while liberalizing imports and

reducing administrative regulations, domestic prices could be brought rapidly into line with international prices. Adopting fixed exchange rate regimes would allow countries to enjoy both the microeconomic and the macroeconomic disciplinary effects exerted on the domestic economy by the opening up process. On the other hand, it was argued that the anticipated benefits of rapid disinflation through the use of fixed exchange rate as the nominal anchor was dismissed on the ground that the experience of developing countries indicates that these gains are only short (Edward, 1993). The costs of exchange rate appreciation on output, trade balance and credibility can outweight them later.

Floating or flexible exchange system operates when the market forces are allowed to determine the realistic exchange rate. Under this system, when exchange rate is allowed to fluctuate freely, it is regarded as a free float,while a situation where monetary authorities enter the market to buy or sell FOREX in order to regulate the speed and magnitude of exchange rate movements is regarded as dirty or managed float. There have been a serious debate even among the early scholars over which of the systems is the best mechanism for determination of an exchange rate. Arguments range between the two extremes of fixed and flexible systems. The case for flexible rates was made by Friedman (1953) and Johnson (1969). Their argument rests on a double claim; that flexible rates would provide a more efficient international system of

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adjustment and hence support a world of freer trade. At the same time, they would free domestic monetary and fiscal policy instruments for domestic purposes. The fundamental argument advanced by the proponents of flexible system is that they would allow countries autonomy with respect to their use of monetary, fiscal and other policy instruments, consistent with the maintenance of whatever degree of freedom in international transactions they choose to allow their citizens by automatically ensuring the preservation of external equilibrium (Johnson, 1969).

Johnson raised a point by arguing in response to the critics of flexible system over the volatility issue. He contends that;

> "One of the common arguments under the heading of uncertainty is that flexible rates would be extremely unstable rates, jumping widely about from day to day ..... Abnormally rapid and erratic movements will occur only in response to sharp and unexpected changes in circumstances" (Johnson, 1969).

The counter argument, especially by Nurkse (1974) is that flexible rates are tantamount to volatile, unstable rates, a source of disturbance and instability rather than efficient mechanism of adjustment.

The discussion over the issue today is not far from the original debate. The proponents of fixed or control system in LDCs argue that it ensures stability in the domestic currency. Ward (1965), emphasized this attribute of a fixed exchange rate regime. In a more fundamental approach, Todaro (1977)

argues that given the structure and features of LDCs, the optimal exchange rate policy is a fixed rather than a flexible exchange rate system. He categorically stated that:

> "Flexible exchange rates are not thought to be desirable especially in the third world ..... because they are unpredictable ..... and susceptible to foreign and domestic currency speculation. Such unpredictable fluctuations can wreak havoc with both short and long-range development plans".

On the other hand, the proponents of the flexible exchange rate deny the propositions that fixed regime, generates exchange rate stability in an economy. Dibua (1990) and Quirk (1989) argues that a fixed exchange rate regime cannot guarantee stability since the rates must be adjusted from time to time. Odozi (1986) argues that pegged currencies often float against other currencies. They asserts that the cost of controls and the rules governing FOREX allocation generate high inefficiencies in the FOREX market, and hence the economy in general.

The exchange rate system operating in an economy reflects the economic policy of that country. Fixed or control exchange rates tends to be associated with controlled economies, while flexible exchange rates tends to be associated with liberal economies (Odubogun, 1995).

2.7 THEORETICAL DETERMINANTS OF REAL EXCHANGE RATE

Factors such as terms of trade, net capital inflow, growth in money stock, degree of openness, nominal exchange rate, and fiscal deficit are identified as causes in short-term real equilibrium fluctuations. These factors are categorized into external; comprising of terms of trade and capital inflows and domestic factors.

The terms of trade effect on the real exchange rate operates through import and export price variations. If the world price of exports increases (i.e if TOT improves), the supply of foreign exchange increases. In a floating exchange regime, the supply curve of foreign exchange shifts rightwards leading to an appreciation of the real excharge rate. Under a fixed exchange rate system the increased supply of foreign exchange leads to an expansion of the money supply and an increase in the general price level. This makes the real exchange rate to appreciate (Krumm 1993).

In general however, a worsening of the terms of trade resulting from an increase in import prices would raise the domestic price level. If domestic policies (including exchange rate policy) are not changed the real exchange rate would tend to appreciate. For instance, a fall in the price of exports or a rise in the price of imports lowers disposable income, generating a higher excess supply of non-tradabl,e downward pressure on the price of non-tradable and hence, a

real depreciation. In other words, for an economy to balance her external accounts, the economy would have to produce more and consume less tradable, implying a relative increase in the price of tradables or a real depreciation. Alternatively, the theoretical literature indicates that the relation between the TOT and the RER is the result of income and substitution effects that depend on the source of the TOT variation. The income effect arises when the RER depreciates/appreciates in response to a fall/rise in the relative prices of exports. A decrease/increase in the relative price of exports tends to precipitate a decrease/increase in the real income of the economy. This in turn exerts a downward/upward pressure on the domestic demand for non-traded goods. The result of this is a fall/rise in the domestic prices of non-traded goods and a depreciation/appreciation of the RER (Obadan, 1994).

Another important factor in RER determination is the capital flows. The flows consists largely of exogenously determined foreign aid or transfers from abroad, and as such capital flows are treated as exogenous in many literatures (Krumm, 1993). Increased sustained net capital inflows will lead to an appreciation of the RER to increase net imports, while a decrease in foreign aid will require a depreciation of the RER to promote net exports. Under a floating exchange rate regime, capital inflows produce an excess supply of foreign exchange which leads directly to a lower domestic currency price of foreign exchange in the FEM, and so the RER

appreciates. But in a fixed exchange rate regime, capital inflow leads to an increase in money supply consequently prices rise and the RER falls (appreciates). Capital flows, usually responds to capital controls which is the extent of controls on the capital account and policies aimed at controlling the level of external borrowing. For instance, restrictive capital controls tend to reduce capital outflows or increase net inflows. This has the effect of appreciating the RER. Conversely, a lessening of capital controls tends to stimulate increased outflow and reduced net inflow, and hence a depreciation of the RER.

The domestic RER fundamentals can be divided into those that are directly affected by policy and those that are not. The most important RER fundamental that is not directly affected by policy is technical progress, though it can be argued that adopting more productive technologies is itself influenced by the policy environment, particularly the existence of competitive markets that promote efficiency (Edwards, 1994). According to Balassa (1988), countries experiencing rapid technological progress in the tradable sector will experience an appreciation of their equilibrium RER. This is due to the fact that technological progress cause price of tradable to fall relative to price of non tradable due to rightward shifts in the supply for tradable.

The policy-related RER fundamentals relate mainly to macroeconomic policy variables and other policy variables such

as fiscal and monetary policy actions. These policies have an impact on the prevailing or short-term RER. For instance, under a fixed exchange rate regime, expansionary monetary policy results in strong upward pressure on domestic prices, leading to temporary real appreciation. In the same way, a loose fiscal policy is reflected in excessive expansion of domestic credit. A macroeconomic policy mix that leads to temporary appreciation (or depreciation) inconsistent with underlying external fundamentals will lead to losses in foreign reserves. This loss in reserves will occur through an increased demand for imports, a decreased supply of exports, or capital movement (where possible) in anticipation of offsetting depreciation or through changes in the desired real balances. The loss in reserves may have a negative impact on the money supply. More commonly however, the nominal exchange rate would be adjusted to relieve the disequilibrium balance of payments crisis. Where inconsistent macroeconomic policies persists over along period, creating excessive demand pressures, the pressure to depreciate the RER would also persist. Hence, the impact of the inconsistent policies is temporary or short-term. The only way to validate an appreciation would be to change one of the structure policy variables. For instance, trade restrictiveness could be increased to maintain external balance. The impact on the medium-term equilibrium RER of such structural or fundamental responses would be part of the estimation of changes in the

RER caused by changes in the structural factors.

Increased trade restrictiveness can accommodate inconsistent macroeconomic policy, but such accommodation would generate high economic costs of income contraction (Krumm, 1993).

RER is also affected by changes in trade/commercial policy. A permanent increase in restrictions on imports, such as an increase in tariffs, will reduce imports and increase the demand for non-tradable goods. The appropriate RER to maintain equilibrium will appreciate because the current account balance will improve. Conversely, trade liberalization in the form of a reduction of effective tariffs and the removal of quotas will generally increase the demand for imports and will require a depreciation of the RER in order to attain external equilibrium. A relaxation of capital controls that leads to capital outflows will require a depreciation of the exchange rate so as to generate more net exports to finance the capital outflow. If the relaxation of capital controls leads to an increase in capital inflows, then the appropriate RER should appreciate. In otherwords, a reduction or elimination of import duties, for instance, allows importers to buy more FOREX for the same level of total expenditures. The resulting increased demand for FOREX under a floating exchange rate regime leads to a rise (depreciation) of the RER.

The RER will also rise in a regime of fixed exchange rates, but this arises because the domestic monetary contraction causes the general price level to fall. On the other hand, a reduction or elimination of export duties reduces the outlay required for a given quantity of exports. Export became more attractive so that the supply curve shifts to the right. Consequently, the RER appreciates. In a fixed regime of exchange rate, the conversion of more foreign exchange into the domestic currency leads to the expansion of money supply. This leads to a rise in price level and a fall (appreciation) of RER (Dornbusch, 1988).

Changes in the nominal exchange rate affects the RER. A nominal devaluation/depreciation will have the effect of depreciating the RER while a nominal revaluation/appreciation of the nominal exchange rate will appreciate the RER. According to Ghura, (1986), the ability of the nominal exchange rate changes to affect the RER, will however depends on the extent to which macroeconomic policies are consistent with the objective of the NER changes. For instance, a nominal depreciation of the exchange rate may not have much effect if the accompanying macroeconomic policies are inconsistent with the NER regime.

Another macroeconomic policy variable that affects the RER is fiscal policy. An increase in government spending increase domestic aggregate spending with consumers having more to spend on both tradable and non-tradable goods. If the

composition, of government expenditure changes in favour of non-tradable goods, then their price will increase and the RER will appreciate. Conversely, an increase in the share of traded goods in aggregate government expenditure will require a depreciation in the RER to reduce imports by the private sector and increase exports in order to attain external equilibrium. The effect of monetary policy on RER depends upon whether such policy is expansionary or not (Obadan 1994) For instance, an expansionary monetary policy, represented by a growth of credit and money supply will exert upward pressure on domestic prices. This in turn, will make the RER to appreciate. In the context of real money balances, injection of money temporarily increase real balances if the price level does not adjust instantly, the increase in money depreciates the RER. On the other hand, reduction in real balances brought about by reductions in money or by a rise in prices for a given quantity of money appreciates the RER.

Additional fundamental factors relevant to the circumstances of individual countries can be included in the analysis wherever proxies for such are available for estimation. One such factor is the import intensity of the manufacturing sector. Higher import intensity is expected to increase the demand for FOREX and put more pressure to depreciation on the RER.

Another factor is the efficiency of export marketing. An inefficient marketing structure leads to a lower exports

prices and a worsened terms of trade and hence is expected to result in a more depreciated exchange rate (Krumm 1993).

2.8 CAUSALITY TEST

Wald (1954), argued that the concept of causality is indispensable and fundamental to all sciences. He pointed out that a regression relationship may or may not involve a causal hypothesis but the introduction of a causal hypothesis make the analysis more determinate and the resulting conclusions more specific. Feige and Pearce (1979) also argued that the causal relationships between economic variables are the `bread' and `butter' of econometric analysis. The usefulness of causality is also given due recognition by Yohannes (1974).

In this study we adopt the use of Granger causality approach as developed by Granger (1969). The standard Granger causality test examines whether past changes in one variable say X help to explain current changes in another variable Y, over and above the explanation provided by past changes in Y. If otherwise then one concludes that X does not Granger cause Y. To determine whether causality runs in the other direction from Y to X one simply repeats the experiment, but with X and Y interchanged (Granger 1969). The following equations can be used to test the causal relationship between X and Y_1.

$$Y_t = \sum_{i=1} \alpha_i Y_{t-1} + \sum_{i=1} \beta_i X_{t-1} + \mu_t \quad \ldots\ldots\ldots\ldots\ldots\ldots \quad (1)$$

$$X_t = \sum_{i=1} I X_{t-1} + \sum_{i=1} I_i Y_{t-1} + V_t \quad \ldots\ldots\ldots\ldots\ldots\ldots \quad (2)$$

and testing i and i (where i = 1,2 .....) to show whether or not X_t fails to Granger cause Y_t and Vice-versa, respectively (Assery and Peel, 1991). The error terms are assumed to be serially independent with mean zero and finite covariance matrix (Pindyck and Rubbin field, 1981). From equation 1, X is said to Granger cause Y if the coefficient of the lagged values of X as a group ($ß_i$) is significantly different from zero, based on a standard F-test. The reverse is the case if it is significantly different from zero in equation 2, feedback relationships or bi-directional causality occurs if X_1 Granger causes Y_t and Y_t Granger causes X_t. The results and analysis for the causality test between RER and TOT, NOMDEV, FGE NCI, MSP and OPN are presented in chapter 4.

A number of previous studies such as Mckenzie (1986), Blundell-Wignall (1989) have established a unidirectional causal effects running from TOT to RER using German data. Whitewall (1983) and Diaz-Abejandro (1980) and Kogan and Orden (1994) have also identified strong correlation between the terms of trade and the RER. This suggests that a long-run conintegrating relationship may exist between the two variables. These studies failed to identify the direction of the causation.

2.9 EMPIRICAL STUDIES

In the theoretical literature, certain factors are identified to have influenced the movement in RER. These

factors are terms of trade, capital inflows, commercial policy growth in domestic money supply, changes in the nominal exchange rate, and the size and composition of government expenditure.

This has inspired many studies within this area to empirically investigate the factors causing variability in the RER Most explanations of short-term real exchange rate volatility suggest a large role for monetary and financial shocks.

Clarida and Gali (1994) and Rogers (1995) both attempted to put bounds on the fraction of total RER volatility that can be attributed for monetary shocks. The key identifying assumption is that any effects monetary variables may have on RER, must purely be temporary. Clarida and Gali (1994), found that monetary shocks alone accounts for roughly 45 percent of the forecast error variance for the dollar-Dutsch mark real rate over the modern floating rate era, and 34 percent for the yen-dollar real rate. Rogers (1995) using 130 years of data from the US and the UK, found that real shocks accounted for roughly half the one year forecast error in real rates. The results of these findings were promising but subject to further investigation. This is because it is not clear that one would find unit roots using similar methods on longer term data. Also, it is difficult to justify identifying as a demand shift any shock with only a transitory effect on the RER, especially if the effect is highly persistent.

Froot and Rogoff (1991) found that among the European

monetary system (EMS) countries, government spending is a significant determinant of the RER. De Gregorio Giovannini and Walf (1994) had a similar result. Froot and Rogoff reason that this effect is observed because relative to private spending government spending tends to fall more heavily on traded goods. Therefore a rise in government spending leads to an increase in the RER.

As Rogoff (1992) emphasizes, any such effect must be transitory because demand shocks can affect the RER in a small country only to the extent that capital and labour are not perfectly mobile across sectors. Over the long-run, with complete factor mobility across sectors, and with open capital markets, the RER is tied down by productivity and other supply factors. Demand matters only for the quantities of foods produced.

Alberto and Perotti (1995) observe that it is possible for fiscal policy to have long-run real effects on a model where distortionary taxes are used to finance government programmes. Rahman, Mustafa and Bailey (1996) empirically investigated the existence of a possible long-run relationship between the US real budget deficits and RER, and also the relationship between the US inflation rate and real dollar exchange rates using cointegration method. In their findings, the augmented Dickey Fueler (ADF) test results indicates a lack of cointegration between the US real budget deficit and the RER

at 1,5 and 10 percent levels of significance. The same is also true of US inflation rates and RER. However, using an error correction model (ECM) at 5 and 10 percent levels of significance they realized a contradictory results. The estimates of the ECM offer evidences to long-term/short-run unidirectional Granger causality from the real budget deficits to the RER, and from the RER to the inflation rate.

Obstfeld and Rogoff (1995) establish empirically the correlation between current account deficit and long-run RER depreciation. The simple correlation between trade-weighted RER changes and changes in net foreign assets position is quite large and significant across 15 OECD countries for the years 1981-1990. Obviously correlation here does not imply causation. Using simulations of the IMF's multi-country model (MULTIMOD), Tamim and Bayoumi (1994) found that the RER/Current account correlation can be quite sensitive to whether the driving factor is a fiscal or monetary policy change. Krugman (1990) argues that current accounts are likely to induce significant RER changes because they lead to transfer of wealth across countries, and home and foreign residents are likely to exhibit very different spending patterns.

El-Badawi (1994) in his study on 22 LDCs, argues that short-term capital flows and port-folio investments have a short-term effect on the RER, but that it has no effect on the long-run equilibrium RER. While long-term capital inflows and

foreign direct investment have a significant appreciating effect on the equilibrium RER.

Rahman and Mustafa (1996) also carried out an investigation using cointegration method to examine a possible long-run dynamic relationship between the trade-weighted RER and real trade balance in US using a quarterly data for 1973-1992. Using the unit root test, their results show that the US real trade balance and the trade weighted US RER are individually non-stationary in levels at 5 percent level of significance. The ADF test affirms that the US real trade balance and the trade-weighted RER do not depict any long-run association during the sample period. This signifies that the variables are independent of each other under the flexible exchange rate system.

Edwards (1988) found that massive capital inflows during the late 1980s induced the appreciation of the RER and loss of competitiveness of exports in Chile.

Krumm (1993) estimated the change in RER equilibrium for philippines and Tanzania based on changes in structural factors from their levels in a reference historical period. While identifying terms of trade (TOT), capital inflow and commercial policy as factors affecting RER, he found that TOT of the Philippines have deteriorated sharply in the 1970s thereby influencing the equilibrium RER. His empirical results provides a positive relation between TOT and the RER, signifying that an appreciation in TOT is accompanied by a

real appreciation of RER. The results further indicates a significant role for capital inflows in determing the RER in the two countries in both countries, TOT and capital inflows were identified as important influences that could be measured. Other influences are the domestic macroeconomic policies and commercial or trade policies which are found to be significant in Philippines, and the import intensity of manufacturing and agricultural marketing efficiency in Tanzania.

Menon and In (1996) examined the long-run relationship between RER and TOT for seven OECD countries. The seven OECD countries studied are the USA, the UK, Germany, Japan, France, Italy, and Canada. They found that there was a strong evidence of causal flow running from RER to TOT for five OECD countries and from TOT to RER for the remaining two. This finding that causality runs from changes in RER to the TOT for five out of the seven OECD countries would appear, at face value, to be counter-initiative. The standard theory suggest, that the causation should run in the opposite direction. An improvement in the TOT for instance should induce a rise in the domestic price level relative to abroad because it transfers income from the rest of the world to the domestic economy.

Grobar (1993) establishes that both domestic and external factors tends to affect RER, thereby causing uncertainty in an economy. He pointed out that since exporting activity may be

depressed by the RER uncertainty, countries attempting to achieve a more outward oriented stance with regard to trade policy should pay attention to the stability as well as the level of the RER. In countries where the source of RER instability is external, government might want to consider making exchange contracts available to firms that exports, so that they can hedge against exchange rate risk. And in countries where RER instability is as a result of erratic monetary or exchange rate policies, he suggests that macroeconomic policy may well be runing at cross-purposes with trade policy objectives

Devereaux and Connolly (1993) examined the effects of consumption subsidies, public enterprise pricing and price controls on the RER. Their findings revealed that lasting public sector price reforms produce, under possible assumptions, a permanent RER appreciation. The results indicates that the removal of a consumption subsidy on a traded goods used solely for consumption purposes will appreciate the RER, owing to increased demand for non-traded goods. And that when a traded good is consumed directly, and is also used as an input, the removal of a subsidy will appreciate the RER if non-traded goods and the previously subsidized goods are general-equilibrium substitutes in supply. They also argued that an increase in the relative price of public sector products tends to increase the demand for other non-traded goods and thus to appreciate the RER. A

relaxation of price control increases the measured price of controlled goods thus having a direct influence towards RER appreciation. Derick (1996) found that the NER has a long-run positive impact on Jamaican output while the relative foreign/domestic price impact is negative in the long-run. He argues that the primary objective of RER adjustment is to correct external disequilibrium and secure other balance of payments improvements. That they are not designed to accelerate the rate of growth of output. The results fail to support the hypothesis that the primary effect of devaluation is to accelerate output growth. Real and nominal devaluations have a direct impact on the demand and supply functions of tradable and so have a direct impact on the external accounts, and that this is the primary aim. The findings suggests that exchange rates devaluations have had a neutral impact on Jamaican output. Also that the implicit assumption that within the RER relationship the NER and the relative price effects are of equal weight is not found to be true.

Devajyoti and Homi (1993) in an attempt to suggest an alternative index for the measurement of real exchange rates pointed out the weaknesses of the traditional trade-weighted RERs. They argued that the traditional trade-weighted RER could not be used to accurately infere changes in competitiveness of exports for two main reasons. First, they ignored the third party exporters, and secondly, they failed to adjust for differing degrees of substitutability between a

country's exports, goods from other countries, and home goods production. The point is that these omissions are quantitatively important for many LDCs and may ever reverse the exchange rate movement indicated by the traditional RER index. Using Philippines, as a case study they estimated the RER using the almost ideal demand system. In the case of Philippines, a few countries (USA, Korea and Taiwan) appeared to be the principal competitors. Their findings suggested that much of the recent growth in Philippines exports could be explained by the greater competitiveness engendered by an appreciating currencies of Korea and Taiwan.

Dropsy (1996) carried out an investigation into the variations in the major RERS over a twenty years period. Joint tests of contegration and stability were applied to five currencies to the US dollar (the Deusch mark, the Japanese Yen and British pond sterling, the Australian dollar and the Canadian dollar) and five European currencies relative to the Deutsch mark (the French Franc, the Italian Lira, the Deutch Guilder, the Swedish Kronor and the Swiss Franc). The two models of RER determination were examined, PPP and a genereric monetary model, and significant empirical evidence of structural breaks for seven exchange rates were found. He argued that deviations from PPP were consistent with structural instability for four European exchange rates relative to the Deutsch marks but not for Swedish Kronor or for the five other exchange rates relative to the US dollar.

The study leaves a wide gap by failing to identify and establish the precise nature of the shocks.

Yang and Huang (1996) tested the validity of the long-run PPP hypothesis. The Engle-Granger techniques tends to reject the long-run PPP hypothesis whereas the Johansen method supports the long-run PPP. The existence of the long-run PPP implies that a cointegration vector of NER, domestic price, and foreign price is expected regardless of using the Engle-Granger two step method or Johnsen maximum likelihood approach. Manzur and Manzur Ariff (1995) used methodology based on divisia index numbers to test the PPP with both short-run and long-run data for Group seven (G7) and the Association for South East Asian Nations (ASEAN) currencies. They demonstrated a fairly close relationship between average inflation differential and average exchange rates change (Logarithmic difference) as is expected from long-run PPP. However, the short-run correlation between domestic price and exchange rate appears to be 0.36, a value far below unity. In addition, the findings indicate that the unit root hypothesis can be rejected based on the Sims test, but it cannot be rejected by the conventional Dickey Fuller (DF) and ADF tests. In short, their results indicate that PPP does not hold at all in the short-run, but holds quite well over a longer-run.

Maria and Giovanni (1996) investigate into the dynamic interrelationships of economic activity in major economies under the fixed and flexible exchange rates. The results

indicates the presence of an international business cycle among industrialized economies under both fixed and flexible exchange rate regimes. They found that both the movements in the levels of output and in the business cycle frequency band have been more important during the period of fixed rates. Guillerno (1988) using data for 1974-82 studied empirically the effects of exchange rate policy and changes in absorption on relative price of non-tradable goods in Chile. He found that the effects of absorption on relative prices tend to be weak and short-lived. Also that devaluation can have a significant direct effect on the relative price of non-traded goods. And that the effect of exchange rate on relative prices is permanent if public sector wages are rigid in nominal terms. He further argues that changes in net capital flows affect the relative prices of non-traded goods through changes in absorption. Consequently, capital inflows could have been a major factor behind the exchange rate policy and the real appreciation observed in Chile in the late 1970s and early 1980s.

Lipumba (1992) analysing the role of exchange rate policies in structural adjustment and economic growth in African countries, argues that maintaining an appropriate exchange rate is a necessary condition for promoting the growth of exports. He further maintained that exchange rate and other macroeconomic policies cannot work if there is no effective government ro provide public goods.

Barungi (1997) using the Engle-Granger two-step procedure to built an ECM investigated into the role of monetary base and the RER in explaining inflationary process in Uganda. In his findings, the RER has a negative sign indicating that a real appreciation of the domestic currency is not inflationary in the short-term. He however, associated the negative sign of the RER in the model to the fact that a significant volume of exports in Uganda during the period covered was financed through import support grants.

Ndung'u (1997) looking at the dynamics of the domestic price level, the exchange rate, and foreign price level in Kenya estimated an equilibrium RER that encompasses different exchange rate regimes. The equilibrium real effective exchange rate was compared with the nominal and real effective exchange rates and showed periods of over-valuation during the fixed exchange rate regime, the real rate declines slightly in the RER rule regime. Identifying two significant cointegrating vectors that span the data used, he performed the multivariate Granger non-causality test (GNC) with stationary linear combinations. The result showed that inflation was predicted by exchange rate changes and changes in international reserves with strong reverse effects. That is the variables drive each other. Exchange rate changes were predicated by changes in domestic credit with reverse effects, while changes in domestic credit and international reserves drove each other. Generally, his results showed that the four

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variables tested; exchange rate, domestic credit (or money supply) foreign exchange reserves and inflation rate, formed a causal structure that is consistent with loss of a nominal anchor in the system. A shock in any of the variables in the system is likely to spill over into all the other variables with reverse effects.

Obadan (1994) using OLS method, estimated two models of RER for Nigeria and found that the prevailing RERs in Nigeria are determined by the external factors; terms of trade and net capital inflows, while the short-run factors, which reflected policy options were monetary and exchange rate policies.

In his findings the influence of commercial policy is not consistent. Similarly, the performance of the fiscal policy variable is not consistent in the two models estimated. Computing the elasticity values at the point of the mean of each of the independent variables he found that the RER was generally inelastic with respect to changes in the TOT and NER. It is only in three equations that the elasticity of RER with respect to the TOT is a little greater than unity, implying for instance that a 10 percent improvement in the TOT will lead to a little more than 10 percent appreciation of the RER. In all the other equations, changes in the TOT lead to less than proportionate changes in the RER. In his study on the monetary and fiscal impulses in an open economy under the fixed and flexible exchange rates in Nigeria, Orubu (1995) found that there exists a weak causal relationship between

monetary and fiscal expansion and exchange rates.

Olisadebe (1991) in an appraisal of the Nigeria's exchange rate policy under SAP, asserts that the RER tended to veer from the equilibrium rate. He identifies certain factors influencing the RER, among which are the relative inflation and interest rates between Nigeria and her trading partners, as well as the incidence of speculation. He argues that for RER to be stable, these variables themselves should be as stable as possible.

2.10 CONCLUSION

In conclusion, of all the reviewed studies, it is only Obadan (1994) that empirically enquired into the factors responsible for RER fluctuations using Nigeria's data. The present study extends Obadan's work in three major respects. Firstly, this study calculates the RER instability indices for the periods 1973-85 and 1986-96, using coefficient of variation. This was not taken care of in other related works. Second, whereas Obadan uses only the simple OLS regression method to capture the influences of external and domestic fundamentals on RER, this study went further to employ Granger causality in testing the causal linkage between RER and each of TOT, NCI,MSP, OPN, NOMDEV and FGE. This is because regression relationship may or may not involve causal hypothesis, but the introduction of a causal hypothesis makes the analysis more determinate and the resulting conclusions more specific (Menon, 1996).

Finally our study included the degree of openness in the model as one of the key variables influencing the RER in an open economy.

CHAPTER THREE

AN OVERVIEW OF THE NIGERIA'S EXCHANGE RATE POLICY MEASURES, 1973-1996.

3.0 INTRODUCTION

In Nigeria, just like any other developing nation, exchange rate policy has been a significant instrument for macroeconomic policy management. It has been frequently applied to preserve the value of the Naira, maintain a favourable external reserve position and ensure price stability.

Over the years, different exchange rate policies have been tried in an attempt to find a realistic and stable value of the naira in terms of the currencies of Nigeria's trading partners. The basic objectives of exchange rate policy irrespective of the economic system adopted are virtually the same as those of the economic policy (Olisadebe, 1991). The ultimate objectives are increased in output and its optimal distribution.

Nigeria, from independence in 1960 to 1986 adopted a fixed or control exchange rate system. The inability of the system to achieve the major objectives of the exchange rate policy led to the reversal of policy in September, 1986 to a flexible system. The flexible system operated under SAP within the period 1986-1994 when the fixed exchange rate system was reintroduced again with the pegging of the naira relative to

the US dollar. This chapter reviews the various exchange rate policies operated in Nigeria and appraises the impact of the policy measures towards achieving the exchange rates stability objective in Nigeria. The exchange rate policy changes, eventhough directly affects the NER, has an influence on the RER. A sound exchange rate policy management will help in bringing about a stable and realistic RER, thereby strengthening the international competitiveness of the domestic economy. The chapter also calculated the RER instability indices, and the effects of RER changes on the economy.

3.1 EXCHANGE RATE POLICY 1973-1985

The last three decades witnessed frequent shifts in exchange rate policies of most economies of the world as dictated by changing economic and financial conditions. Yet in many countries, efforts to achieve a viable exchange rate policies are still on as their domestic and international economic environments have not sufficiently stabilized (Grobar, 1986). Various exchange rate policies adopted in Nigeria prior to 1986 were largely geared towards an effort to restrict or ration the use of FOREX at officially determined rates. The establishment of the Central Bank of Nigeria (CBN) in 1959 marked the beginning of the first phase of Nigeria's exchange rate policy. Being the apex regulatory body in the country's financial system, the CBN's main objective was to

have a strong and stable national currency for Nigeria (Olukole, 1994). Nigeria's exchange rate remained at par with the pound sterling from 1959 until the devaluation of the sterling in November, 16, 1967. Thereafter, the currency was allowed to move independently of the sterling, to include US dollar in the basket of the currencies for determining the value of the Nigerian pound. In 1971, the Nigeria's currency was pegged against a basket of currencies of her seven major trading partners (U.K., US, Germany, France, Japan, Switzerland and Netherlands). This was in an effort to minimize the effect of fluctuations of exchange rates of other major currencies on the Nigerian currency. It was expected that this would stabilize the effective exchange rates of the Naira under the assumption that the loss in value due to the devaluation of one currency in the basket would be compensated by the appreciation of another currency in the same basket. In 1973, the Nigerian currency was decimalized and changed from the pound to the naira. Following this change, fixed exchange rates were established for both pound sterling and the US dollar at £0.5833 and US $1.5200 to₦ 1.00 respectively (CBN, 1989). With the devaluation of the US dollar in the later part of 1973, the value of the naira also fell because of its direct relationship with the dollar. This then became an issue of concern when the dollar persistently depreciated. By the end of 1973 the Nigerian government decided to discontinue any direct relationship between the naira and

either the pound sterling or the US dollar. In an attempt to source cheap inputs for the implementation of developmental projects, the authority further appreciated the value of the naira. In 1978 the Nigeria authority changed her exchange rate policy. The authority introduced a basket method of calculating the exchange rates. The currencies of the seven major trading partners were designated with different trade weights based on the relative shares of the countries whose currencies were included in Nigeria's 1976 total imports (Ogun, 1985). The weights of the pound sterling and the US dollar were higher than others reflecting the fact that the bulk of Nigeria's external payments were made in pound sterling and the US dollar. The weights of the two currencies were relatively higher than others.

Although the naira was pegged to a basket of currencies under the managed floating system, it nevertheless responded to significant changes in the economy from the mid 1970s. Accordingly the naira appreciated in value relative to the dollar during the oil boom periods of 1974 and 1975, and 1978-1980 (CBN, 1995).

With a sizeable foreign reserves arising from oil boom Nigeria then found it easier to manage a fixed exchange rate policy through reserve movements. As the oil money keeps on flowing in, there was no pressure on the government to adjust the nominal exchange rate of the naira by the difference in international prices to ensure a stable index of RER. The

Nigeria's external reserves rose from₦ 104.6 million in 1970 to₦ 3,112.5 million in 1974 (See table 3.1). It then rose marginally in 1975 and started declining in the subsequent years. At the peak of the oil boom, the external reserve shot up to₦ 3,043.2 million and ₦5,445.6 million in 1979 and 1980 respectively (Table 3.1). As a result of a low demand of petroleum and a drastic fall in the oil prices from a maximum of over $38.00 to a minimum of less than $10.00 per barrel there was a fall in the oil revenue (Odubogun 1995). This resulted to fewer FOREX accruable to Nigeria, which in turn meant fewer and fewer goods to be imported. The imports initially rose from₦ 756.4 million in 1970 to a maximum of₦ 12,599.1 million in 1981 and keeps on declining in the subsequent years (See table 3.1).

Table 3.1

GROWTH IN THE NIGERIA'S EXTERNAL RESERVES
1970 - 1985

Year	Total Export	Total Imports	External Reserves
1970	885.7	756.4	104.6
1971	1,293.4	1078.9	132.3
1972	1,412.2	987.6	191.6
1973	2,278.4	1,224.8	241.0
1974	5,794.8	1,737.3	3,112.5
1975	4,988.4	3,717.4	3,380.1
1976	6,622.4	5,132.6	3,057.6
1977	7,881.7	7,159.7	2,521.0
1978	6,380.5	8,132.0	1,249.1
1979	10,397.5	6,161.9	3,043.2
1980	14,198.7	9,095.6	5,445.6
1981	11,033.8	12,599.1	2,424.8
1982	9,196.4	10,100.2	1,026.5
1983	7,751.8	6,555.7	781.7
1984	9,138.8	4,484.5	1,143.8
1985	11,720.8	5,536.9	1,641.1

Source: CBN Statistical Bulletin, 1987.

On the other hand, Nigeria's total export rose from₦ 885.7 million in 1970 to a peak of N14,198.7 million in 1980 (Table 3.1) and later declines.

The dependent nature of the economy made it impossible to survive without importation. This led to serious balance of payments and debt crisis. The balance of payments position was favourable at 3,1,102.2 in 1974 but later changed to a negative balance over the years reaching -3,020.8 in 1981 (See table 3.2).

Table 3.2

SELECTED MACROECONOMIC INDICATORS
(1970-85)

Year	Nominal Exchange rate	Growth in money supply	Inflation rate	External debt out-standing	Balance of payments position
1970	0.7143	608.3	13.8	175.0	58.6
1971	0.6955	628.9	15.6	178.5	128.8
1972	0.6579	700.9	3.2	265.6	-39.6
1973	0.6579	827.1	5.4	276.9	174.4
1974	0.6299	1,178.3	13.4	322.4	31102.2
1975	0.6159	2,044.0	33.9	349.9	157.5
1976	0.6265	3,293.0	21.2	374.6	-339.0
1977	0.6466	4,794.4	15.4	365.1	-527.2
1978	0.6060	5,089.7	16.6	1,252.1	-1,293.6
1979	0.5957	6,147.1	11.8	1,611.5	-1,868.9
1980	0.5464	9,226.8	9.9	1,866.8	2,402.2
1981	0.6100	9,744.9	20.9	2,331.2	-3,020.8
1982	0.6729	10,048.6	7.7	8,819.4	-1,398.3
1983	0.7241	11,282.4	23.2	10,577.7	-301.3
1984	0.7649	12,204.1	39.6	14,808.7	354.9
1985	0.8938	13,267.8	5.5	17,808.7	349.1

Source: CBN Statistical Bulletin, 1987.
CBN Annual Reports (Various Issues).

The external debt outstanding also rose tremendously moving from₦ 175 million in 1970 to₦ 2,331.2 million in 1981. It then shot up to₦ 8,819.4,₦ 10,577.7 and₦ 14,808.7 millions in 1982, 1983 and 1984 respectively (Table 3.2). This was at the peak of the Nigeria's economic crisis. Money supply and the inflation also keeps on growing at an alarming rate as indicated in table 3.2.

As a measure to curb the situation, FOREX from Central Bank was strictly rationed and controlled through an import licensing system meant to protect official reserves. The problem was that when the level of reserve increased, the naira appreciated, but was never allowed to depreciate when the reserve level falls. This then creates an impression that a continuous drain on the official reserves could sustain an overvaluation of the naira. In order to curb this problem, strict exchange control measures were adopted.

From 1980 to 1981, the degree of exchange control was reduced largely due to an improvement in the BOP brought about by a positive development in the international oil market. The soft-pedaling was also due to the difficulty associated with tight exchange control regulations. The relatively liberal system of exchange controls in the early 1980s was mainly aimed at curbing rampant abuse and malpractices in respect of FOREX transactions, such as over invoicing of import bills,

smuggling of currencies and goods across the borders and false documentation of import bills. Because the policy was not sustainable, controls had to be tightened. In 1983, the IMF complained about the higher incidence in naira exchange rates quotation having risen above the stipulated 2 percent limit. Consequently, the management evolved a system whereby the perennial problem being caused by arbitrage incidence in the naira exchange rates quotation could be minimized or eliminated. In December 1985, it was agreed that a one currency intervention system be adopted to solve once and for all the problem. In this system, the naira exchange rates were quoted against a single intervention currency, the US dollar. Although the system helped to wipe out the incidence of arbitrage that prevailed during the period before its adoption, it had the disadvantage of making the naira to be tied to the fortunes of the dollar, i.e. to float or sink with the dollar in the international foreign exchange market. The system used to determine the value of other currencies in terms of the naira was to maintain the US $/₦ rate at a point and deriving the cross rates of other currencies against the naira through such a quotation i.e. the other currency rates taking a cue from such quoted US $/₦ rates (Olukole, 1992).

The period between 1982 and 1986 marked the last phase of exchange control in Nigeria. The stringent exchange control measures as in earlier periods was proceeded by severe BOP pressures. As part of the global economic recession, Nigeria

at this time was experiencing severe economic difficulties. FOREX receipts both from oil and non-oil exports were consistently less than the disbursements for imports (CBN, 1987).

From 1984 to 1986, the country adopted a crawling peg system by relating the value of the naira to the pound sterling and the US dollar as her two currencies of intervention. This was because the bulk of Nigeria's external payments was made in pound sterling and the US dollar. From time to time, the relative value of the naira vis-a-vis the pound sterling and the US dollar was adjusted as necessary. Faced with severe economic pressures of the late 1970s and early 1980s, the Nigerian government enacted the economic stabilization Act of 1982 with the aim of correcting the BOP problems and the distortions in the domestic production and consumption pattern. The exchange control measures of 1982 achieved little in remedying the problem of the external sector crisis. This was because of the continuous fall in the price of oil which of course brought about a decline in FOREX earnings. Despite the reduction in imports the debt service ratio for 1983 was 17.5 percent as compared to 0.7 percent in 1980 (Odubogun, 1995). The exchange control measures were strictly maintained throughout 1985 to mid - 1986, with some modifications and adjustments. It became apparent during the middle part of 1986 that the ad-hoc measures established to correct the severe crisis had proved incapable of solving it.

The policy response was therefore a shift away from an exchange control regime to a market directed or deregulated regime.

3.2 EXCHANGE RATE POLICY MEASURES 1986-1996

The exchange control system which was in operation prior to 1986 was believed to have made the naira over-valued in terms of other international currencies. This was viewed as the major factor that brought about the distortions and disequilibrium in the economy. It made the country to be more import dependent and less non-oil export driven in the last quarter of the century (James 1988). The country was therefore unable to achieve its main objectives of policy during the period. In order to find a realistic value of the naira, the approach of the second Tier Foreign Exchange market (SFEM) was introduced under the SAP, adopted at that time to reverse the structural distortions in the economy. In september, 1986, the SFEM Decree was promulgated, thereby introducing a flexible or floating exchange rate regime. The main objective of the exchange rate policy contained in the Decree was to have a realistic exchange rate which would remove the existing distortions and disequilibrium in the external sector of the economy as well as ease the country's persistent BOP problems. With the introduction of SFEM as a policy the system of operating two markets was adopted. The second-tier market and the existing first-tier market were

allowed to operate side by side until 2nd, July 1987 following the convergence of the two rates. Under SFEM, exporters were allowed to hold 100 percent of their FOREX proceeds in domiciliary accounts and they were allowed unhindered access to the funds therein. The SFEM was operated alongside a managed First-tier official exchange rate, while the second-tier was based largely on market forces. Transitional transactions and pre-SFEM transactions such as debt service payments, public sector imports expenditure of Nigeria's missions abroad and payments of international organizations were effected through the first-tier rate. Other private sector transactions were effected at the second-tier rate which was relatively more depreciated. The SFEM was operated by the CBN. During the first two auctions in the SFEM, the exchange rate was determined by averaging the successful bid rates. After the first two biddings, the average rate method was replaced with marginal rate pricing which had the potential of reducing the observed continuous depreciation of the currency (Obaseki, 1997). To introduce more professionalism into the system of bidding that is, to ensure that bids reflect economic fundamentals, the Dutch Auction System (DAS) was put in place in April 1987. Under the system dealers were allocated funds at their bid rates. The objective was to reduce the propensity for high bids. However, the official exchange rate was determined at the margin. In addition, the bidding period was changed from once

a week to once in a forthnight.

Various methods of exchange rate determination were applied to fine-tune the system while the regime lasted. These included the average pricing method, marginal rate pricing and the Dutch auction system. The system, however, created the problem of multiplicity of rates which resulted in further depreciation of the naira. Given the simultaneous operation of the first-tier foreign exchange market (FFEM) and SFEM in 1986, two sets of rates emerged - one administratively determined and fixed, the other under SFEM, determined through the forces of demand and supply. Given that demand for FOREX under the SFEM always exceeded supply, there was a continuous depreciation of the naira in this market. At the first SFEM bidding session for instance, while the exchange rate in the FFEM was₦ 1.5691 to US $1.0, the SFEM rate was₦ 4.6174 to US $1.0 (CBN, 1987). A further liberalization and decentralization of this dual system to make room for foreign exchange market (FEM) and the autonomous markets on 2nd July, 1987 did not do much to prevent the depreciation of the naira. This was aggravated by the abuse of this liberalized policy by bankers. Between mid-1987 and December 1988, a wide premium had been created between the FEM rates and the autonomous rates. The authorized dealers kept the autonomous rates high reflecting a faster depreciation of the naira than in the official FEM. While the autonomous rates during the period January to August 1988 ranged from₦ 4.3611 to₦ 6.8800,

the FEM rates ranged from ₦4.7740 to ₦4.6440. In December 1988, the FEM rate was₦ 5.3530 while the autonomous rate was₦ 8.2856 (Olukole, 1992). This development led to the abolition of the autonomous market and the creation of a unified system. Due to the abuse of the dual exchange rate system, both the first and the second-tier exchange rates were merged in July, 1987. A unified exchange rate system emerged under the Foreign Exchange Market (FEM). This system subjected all transactions to market prices thereby allowing banks to transact FOREX business among themselves. But the persistent depreciation of the naira exchange rate led to the separation of the Inter-bank market for banks from the official market resulting in the emergence of an autonomous market with its independent rate for privately sourced FOREX. This autonomous rate was subsequently merged with the FEM rate in January, 1988, to form the Inter-bank Foreign Exchange Market IFEM) because the autonomous rate had depreciated continuously, thereby fueling rent-seeking activities in the economy.

To further eliminate the abuses inherent in the system and reduce exchange rates instability the naira exchange rate under this regime was determined using several methods. One or more of the numerous criteria ranging from simple average weighted average to monitoring developments in exchange rates of convertible currencies was applied to determine the exchange rate at different times. There was therefore no specific criteria for determining the exchange rate (Ojo,

1996).

In 1989, the FOREX transactions system yet witnessed another development with the establishment of Bureau de change which was basically aimed at allowing access of FOREX to small users and also to widen the scope of the officially recognized FEM and make FOREX transactions less cumbersome and less formal for small transactor. As a secondary objective, the Bureau de change was expected to gradually absorb the informal FEM.

In order to further reduce instability in the FEM, the interbank procedures were modified in December, 1990 when the Dutch auction system was re-introduced. The DAS was first applied in April 1987, but the instability in the FEM could not be stemmed. As a result, a model weighted average method of exchange rate determination was introduced in August, 1991. Under the system, the rates tending towards the mode were used to determine the market exchange rate. The system succeeded in reducing wide fluctuations in the official exchange rate but instability soon set in as the parallel market commenced a process of sustained depreciation, leading to the widening of the premium between the parallel and the official market. For instance the parallel market premium reached 79.2 percent in February, 1992 compared with 35.5 percent in 1991 and the internationally acceptable standard of 5.0 percent (Olisadebe, 1994). All these changes failed to reduce the wide fluctuations in the exchange rate. The authorities then took another step by deregulating the system

fully. The CBN completely floated the naira on 5th March, 1992. This was done systematically by depreciating the naira exchange rate at the IFEM again in order to equate it with the parallel rate which was considered the more appropriate indicator of the market perception of the value of the naira-vis-a-vis other currencies. This was aimed at narrowing the parallel market premium and enhancing the operational and allocative efficiency at the IFEM through adequate participation in the market. Under the system, the CBN was ready to sell unlimited amounts of FOREX provided the appropriate naira cover was provided. The official exchange rate was adjusted from₦ 10.5564 to $1.0 to₦ 18.00 to US $1.0 on 5th March, 1992 (CBN, 1997).

Initially the parallel market premium was narrowed to a level below 10 percent. However, as a result of renewed demand pressures and speculative activities the premium started to widen again. The official exchange rate for the naira was administratively pegged at₦ 21.9960 to a dollar for most of 1993, while FOREX allocation was done on a prorata basis. As a result, the parallel market exchange rate continued to diverge widely from the official exchange rate with the Bureau de change exhibiting similar trends.

The emerging parallel market premium was considered too large to be allowed to persist as it was a disincentive to the policy stances of achieving exchange rate stability and optimal FOREX allocation.

The system of fixed exchange rate was again re-introduced in 1994 to stabilize and shore up the value of the naira. The official exchange rate for the naira was formally pegged at₦ 22.00 to US $1.00. This was done by centralizing all FOREX receipts in the Central Bank. The policy stance was aimed at instilling sanity into the FEM and encouraging increased activities in the productive sectors of the economy. In pursuance of these objectives, the government re-affirmed the illegality of the parallel market for FOREX transactions and prevented Bureau de change from selling FOREX.

A FOREX allocation Committee known as the Ministerial Allocation Committee was set up in 1994 to oversee FOREX allocation. The Committee was basically set up to supervise the FOREX allocation to various sectors of the economy using certain percentages as a criteria for allocating the FOREX. With the main objective of allocating available FOREX to meet the basic needs of end-users, the committee provides that 15 percent of available FOREX be set aside for priority imports and scheduled for allocation every fortnight. The remaining 85 percent was allocated on a pro-rata basis using the earlier formula. Allocation for priority items was later raised to 20 percent.

The deregulation of the economy in 1994 rather than shoring up the value of the naira and stabilizing the FEM, further reduced the value of the naira and set in a self-sustaining phenomenon of exchange rate depreciation in the

parallel market. The measures, put in place to manage FOREX in 1994 failed to address the crucial issues of improving FOREX receipts through raising the level of non-oil exports and enhanced capital inflow. The problem of the widening parallel market premium could also not be addressed. At the end of 1994, the parallel market premium was in excess of 350 percent (Olisatebe, 1994).

Against the background of persistent instability in the FEM, declining non-oil export receipts, widening parallel market premium, and sustained pressure on the external sector resulting from inappropriate policy measures adopted in 1994, and the attendant rising inflationary spiral, a reversal policy stance was introduced in 1995.

The FEM was again deregulated in 1995 under a policy of "guided deregulation". This policy was aimed at addressing the substantial depreciation of the naira exchange rate in the parallel market and achieving efficient allocation and utilization of resources. In this regard, the exchange control Act of 1962 was repealed, while the foreign exchange (monitoring of miscellaneous) provision Decree 17 of 1992 was promulgated.

The goal of FOREX and exchange rate policy since 1995 centred on the deliberate build-up of external reserves to improve the credit worthiness of the Nigerian economy and its competitiveness, strengthen the naira and gradually move the currency towards convertibility (CBN, 1997). The major

element of the deregulation was the establishment of the autonomous market for FOREX known as the Autonomous Foreign Exchange Market (AFEM). The AFEM is a channel for trading in privately sourced FOREX while the fixed exchange rate in the official market remained for bonafide government transactions. The rate at AFEM is market determined while the Central Bank intervenes initially monthly, but later on weekly basis in order to regularly monitor developments in the market and ensure stability in the naira exchange rates. The fixed exchange rate of₦ 22.0 to US $1.0 was retained for eligible public sector transactions, including debt service payments and national priority projects. The distinguishing features of the new AFEM vis-a-vis the one that was abolished in 1989 was its enlarged institutional scope and the prohibition of inter-bank dealings with official intervention funds in the market. Prior to the 1989 dispensation, the autonomous market was mainly an inter-bank market and official FOREX was eligible for transactions in the market. The main motive of introducing the new foreign exchange policy was borne out of the believe that the former system has failed to stabilize the naira exchange rate. For that a more liberalized and market-based system could substantially reduce the parallel market premium and eventually ensure the convergence of the various exchange rates via single and enlarged FEM. It was also expected to stabilize the naira exchange rate, induce increases in non-oil export earnings and reduce excessive

demand pressures in the FEM.

To address the supply problems in the AFEM and prevent exchange rate volatility, the CBN intervenes in the market as it deems fit, by selling FOREX to end-users through selected authorized dealers. The 1995 policy measures continued through 1996 (CBN, 1989).

3.3 THE EXCHANGE RATE POLICY MEASURES AND THE STABILITY IN NAIRA EXCHANGE RATES

From 1973, when the Nigeria's currency was changed from the Nigerian pound to the naira, various measures were put in place to find a realistic and stable exchange rate as reviewed in the previous sections. Stability of the exchange rate is achieved when the rate is devoid of rapid fluctuations or when the rate fluctuates within a prescribed or targeted band (Obadan, 1992). The attainment of stability is dependent on a number of factors such as the supply and demand for FOREX, the type of exchange rate system in force and the adequacy and appropriateness of complementary monetary and fiscal policies. It should be borne in mind here that stability of exchange rate does not connote fixity. The exchange rate may be said to be stable if fluctuations in the rate are small, and divergence between the various rates is also small if more than one rate persists while the parallel market premium is within tolerable limits (Olisadebe, 1992).

Prior to the introduction of the market determined system of

exchange rate, as previously stated, Nigeria was operating an exchange control system. Under this system, the government and the monetary authorities concerned fixed the rate at which the domestic currency could be exchanged for foreign currencies. The exchange control regime though exhibited a little instability in the naira exchange rate, the problem was not viewed as serious (Uba, 1992). This was due to the fact that Nigeria then had a lot of FOREX reserves to take care of the problem. Notwithstanding, various policy measures were put in place to reduce to a barest minimum, the exchange rate instability during the period.

In 1986, Nigeria adopted SFEM under the SAP as a way of finding a realistic and stable value of the naira through the interplay of the market forces. This made the naira exchange rate more unstable than during the period of exchange control. This can be seen in table 3.3 below.

Table 3.3

PERCENTAGE DEPRECIATION OF THE OFFICIAL NAIRA NOMINAL EXCHANGE RATE 1973-1996.

Year	Official Exchange Rate /$	Percentage Depreciation
1973	0.6579	0
1974	0.6299	-4.45
1975	0.6159	-2.27
1976	0.6265	1.69
1977	0.6466	3.11
1978	0.6060	-6.70
1979	0.5957	-1.73
1980	0.5464	-9.02
1981	0.6100	10.43

1982	0.6729	9.35
1983	0.7241	7.07
1984	0.7649	5.33
1985	0.8938	14.42
1986	2.0208	55.77
1987	4.0179	49.71
1988	4.5367	11.44
1989	7.3916	38.62
1990	8.0378	8.04
1991	9.9095	18.89
1992	17.2984	42.71
1993	22.8861	24.42
1994	22.8861	0
1995	22.8861	0
1996	22.8861	0

Source: CBN Statistical Bulletin, 1997

The exchange rate moved from₦ 0.8938 to US $1.00 in 1985 to₦ 4.0179 to US $1.0 in 1987 (Table 3.3) showing a 77.8 percent depreciation just within one year and few months into the SFEM.

The introduction of FEM, DAS and the implementation of the various complementary monetary and fiscal measures have not stemmed the pressure on exchange rate. The naira for instance depreciated by 38.6 percent from₦ 4.5367 to US $1.0 in 1988 to₦ 7.3916 to US $1.0 in 1989 (Table 3.3). Since the introduction of the DAS on December, 14, 1990, the naira has weakened markedly. At the end of December 1990, one US dollar traded for₦ 8.0378 in the official market, indicating a depreciation of 8.04 percent when compared with the rate prevailing on the eve of the introduction of the DAS. Making a comparison between the pre-reform (1973-1985) and post-

reform (1986-1996) periods, showed that the pre-reform period exchange rate was relatively table at an average of₦ 0.65 to US $1.00. Although the naira had depreciated over the period, prior to 1979 showing an average depreciation of 3.0 percent, it depreciated at an average of 10.20 percent between 1980 and 1983 (Table 3.3). There was a slight appreciation of the naira in 1984 from its level in 1983, but this was again reversed in 1985 when it depreciated by 14.42 percent.

On the whole, between 1986 and 1990 - the period of SFEM operation - there was a general upward movement of the₦ /$ exchange rate. Between 1985 and 1986, average depreciation was 49 percent. The average annual depreciation over 1985-1996 was 95.9 percent (Table 3.3). The major observation from table 3.33 is that the₦ /$ exchange rate was relatively stable between 1973-85. Secondly, the deviations; upward and downward were rather small. However, from 1986-1996, the exchange rate ceased to be stable and its movements became generally upward.

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3.4 THE REAL EXCHANGE RATE INSTABILITY INDICES

The common view that RER instability is undesirable really rests on the fact that the RER instability is a response to domestically generated instability, that is in monetary and fiscal policies (Barth, 1992). It is thus a symptom of undesirable domestic policies. In this section, we

shall calculate the degree of RER instability during the two broad periods i.e. 1973-1985 and 1986-1996.

Following Assery and Peel (1991) and Edward (1994), this study used the coefficient of variation to calculate the instability indices for the two periods. The coefficient of variation of the RER for the period 1973-85 and 1986-96 was used to represent variability. The smaller the coefficient of variation, the smaller the underlying fluctuations during the period, and vice-versa.

It can be expected that inconsistent macroeconomic, trade and exchange rate policies, and frequent policy changes raised the variability of RER, send conflicting signals to economic agents, and lower the credibility of economic policies (Beenstock, 1990). This in turn raised the uncertainty of economic returns on imported inputs and long-term investments. The profitability of producing tradable goods also becomes uncertain.

In calculating the coefficient of variation, we first get the deviation of the RER from the mean value. The coefficients of variation for the period 1973-85 was 77.15 percent while 1986-96 period has 67.2 percent. Comparing the coefficients of variation for the two periods, we found that the instability index is greater during the period 1973-1985. Hence there was more fluctuations in the RER in the period 1973-85 and less fluctuations in the later period. This

indicated that the earlier period had more inconsistency in macroeconomic, trade, and exchange rate policies which maked the RER unstable over the years, than the later period when SAP was adopted as a reform measure. To this effect SAP policies have played a vital role in reducing the RER instability in Nigeria.

3.5 REAL EXCHANGE RATE CHANGES AND NIGERIA'S TRADE BALANCE

From the theoretical point, an increase in RER implying an appreciation will lead to a decrease in exports and an increase in imports which will worsen the trade balance. Conversely, a decrease in the value of RER implying real depreciation should, ceteris paribus lead, to an improvement in the trade balance. Therefore, the expectation is an inverse relationship between RER and the trade balance (Krumm 1993).

Table 3.4 shows the effects of RER changes on Nigeria's trade balance. Between 1973-74 RER depreciated and the real trade balance improved, the rate of inflation declined from 16.0 percent in 1971 to 5.4 percent in 1973.

Table 3.4

Table 3.4

REAL EXCHANGE RATE AND NIGERIA'S REAL TRADE BALANCE.

Year	RER	Change in RER	Trade Balance (US $m)	US whole price Index	Real trade Balance	Change in Real trade Balance
	(1)	(2)	(3)	(4)	(5)	(6)
1973	46.36	-6.7	1893	43.63	43.38	104.3
1974	46.13	-0.5	7218	51.84	139.23	200.5
1975	57.50	24.6	1845	56.63	50.23	-63.9
1976	66.93	16.4	2644	59.26	44.61	-11.2
1977	69.54	3.9	2696	62.90	42.86	-3.9
1978	79.81	14.8	-1169	67.79	17.24	-140.2
1979	89.05	11.6	4924	76.29	64.54	474.4
1980	85.25	-4.3	11176	87.06	128.37	98.9
1981	88.73	4.1	-831	95.01	-8.74	-106.8
1982	81.97	-7.6	-2737	96.92	-28.17	-222.3
1983	90.91	10.9	-1089	98.14	-11.09	-60.6
1984	117.6	29.4	2992	100.48	29.77	368.4
1985	100.0	-15.0	5616	100.00	56.16	88.6
1986	31.75	-68.25	2313	97.11	23.81	-57.6
1987	28.0	-11.8	3448	99.67	34.59	45.3
1988	30.0	7.1	26.26	103.68	25.32	-26.7
1989	28.5	-5.0	2844	108.81	26.13	3.2
1990	100.0	71.5	7983	95.06	83.98	68.9
1991	85.0	-15.0	3234	91.1	33.31	60.3
1992	70.5	-17.1	3611	100.0	36.11	8.4
1993	77.2	9.5	595	107.2	5.55	-84.6
1994	142.4	84.5	306	109.3	2.80	-49.5
1995	120.5	-15.4	1049	110.0	9.60	-70.8

Source: International Financial Statistics 1996.

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The money supply on the other hand rose from a rate of 4.2 percent in 1971 to 9.6 percent in 1974 (CBN 1986). Although the nominal exchange rate appreciated, the rate of domestic inflation was relatively low and so the RER depreciated, thus improving the trade balance which reached a peak of $139.2 million in 1974 (Table 3.4). This period witnessed a surplus budget which also contributes to the improvement in the real trade balance. The extraneous factor of oil price hike in the international oil market also ensured favourable trade balance.

Between 1974-78, the RER appreciated while the real trade balance worsened. The rate of inflation increased substantially over this period, moving from 12.7 percent in 1974 to 34 percent in 1975 but declined to 21.8 percent in 1978 (Obadan, 1994). The growth rate of money supply declined from 89.7 percent in 1974 to 43.8 percent in 1977 and -8.2 percent in 1978 (CBN 1986). But the fiscal deficit increased substantially. Over the period, nominal exchange rate depreciated only in 1976/77 but the RER appreciated, while the real trade balance reduced between 1975 and 1978 but improved from 1978-80. Thus although the fiscal deficits increased, the huge external financial resource inflow ensured the appreciation of the nominal and real exchange rates. Between 1978 and 1979 however, the relationship between RER and real trade balance went contrary to a priori expectation. In this period RER appreciated from 79.81 to 89.05 in 1978 and 1979

respectively, while the real trade balance improved from 17.24 to 64.54 in the respective years. Although the inflation rate falls, the combination of huge money supply growth and enhanced capital inflow accounted for the RER appreciation. The overwhelming influence of huge oil revenue inflow ensured that even though the RER appreciated, the trade balance, largely reflecting oil trade, also improved. Oil exports are generally independent of real exchange rate changes. In 1980, a real depreciation coincided with a reduced trade balance. With the exception of 1982, the RER appreciated from 1980-84 while the real trade balance generally worsened. This was the period of the collapse of the international oil market and a subsequent realization of trade deficits. On the otherhand, the inflation rate rose generally from 10 percent in 1980 to 39.6 percent in 1984. The money supply growth reduced substantially from 50.1 percent in 1980 to 8.2 percent in 1984 but the fiscal deficit worsened tremendously being as high as₦ 5,364.5 million in 1983 (CBN, 1986). The nominal exchange rate policy during this period was one of gradual depreciation of the local currency but the rate of inflation was much higher than the nominal exchange rate depreciation. With that the RER appreciated and the real trade balance worsened.

Between 1985-89, both the nominal exchange rate and the RER depreciated significantly following the adoption of the market determined exchange rates in the foreign exchange market. The behaviour of the real trade balance was erratic

over the period. In 1990, RER appreciates and the real trade balance proved also contrary to the a priori expectation. This period witnessed a rising inflation rate, associated with a growth in money stock and a large capital inflow contributed to the appreciation in the RER.

From 1991-95, the movement in RER, was erratic appreciating in some years and depreciating in others. The real trade balance also moved in the same direction. Between 1991-92, the RER depreciated and real trade balance improved (Table 3.4). The real depreciation attained was largely due to the influence of the nominal exchange rate depreciation recorded during the period. A look at the analysis shows the expected inverse relationship between the RER changes and the trade balance during the period 1973-1995.

CHAPTER FOUR

MODEL SPECIFICATION AND ANALYSIS OF EMPIRICAL RESULTS

4.0 INTRODUCTION

This chapter gave an empirical analysis of the influence of the explanatory factors/variables on the RER in Nigeria over the period 1973-1996.

We adopted the use of simple econometric model and also used of the Granger Causality test to capture the influence of each of the explanatory variables on the RER. Our model is a simplification of reality and is set up in a mathematical equation that allows for empirical testing and evaluation. The Granger test was used to establish the direction of causality (if at all it exists) between each of the explanatory variables and the real exchange rate in Nigeria.

4.1 THE MODEL

Following Edward (1988) and Obadan (1994), we specify our model in a functional form as:

$$RER = F(TOT, NCI, MSP, OPN, NOMDEV, FGE) \quad \ldots\ldots\ldots \quad (4.1)$$

and transform it into a regression form as;

$$RER_t = b_o+b_1TOT+b_2NCI+b_3MSP+b_4OPN+b_5NOMDEV+b_6FGE+\mu \quad \ldots\ldots (4.2)$$

Where,

RER = Real exchange rate

TOT = Terms of trade measured as the ratio of the index dollar value of export prices to the index dollar value of import prices.

NCI = Net capital inflow, measured as the difference between net change in reserves and trade balance scaled by GDP.

MSP = Rate of growth of money stock.

OPN = Degree of openness, measured as the ratio of export plus import to GDP.

NOMDEV = The change in the official nominal exchange rate.

FGE = Fiscal policy variable - ratio of total federal Government expenditure to GDP.

μ = Disturbance term.

b_o-b_6 = are the parameters to be estimated.

4.2 ESTIMATED RESULTS AND APPRAISAL

The estimated results of the equation 4.2 is given as;

RER_t = 365+2.58TOT-0.0639NCI-1.34MSP-744.OPN+5.78NOMDEV -
(2.59) (3.90) (-1.69) (-0.54) (-3.24) (1.04)
(-1.10) 5.96 FGE.

(t-ratios in parenthesis).

R^2 = 0.74 R^2(adj) = 0.65 D.W. = 1.70.

The multiple correlation coefficient of 0.74 shows that there is a high degree of association between the explanatory variables taken together and the dependent variable. The adjusted R^2 with a value of 0.65 indicates that 65 percent of

the variations in RER is accounted for by changes in the explanatory variables. The Durbin Watson (D.W). Statistic value of 1.70 indicates absence of serial correlation.

Two variables in the equation conform to a priori expectation with regard to sign and statistical significance. These are the terms of trade (TOT) and NOMDEV (nominal exchange rate changes). The coefficients of the two variables are statistically significant at 5 percent level. These two variables explained a greater percentage in RER variation. An improvement in the TOT lead to appreciation in the RER, while a deterioration with TOT lead to a depreciation of the RER. Conversely an appreciation of the nominal exchange rate leads to an appreciation in RER and a depreciation on the otherhand leads to a depreciation in RER. From the RER figures (IMF), it shows that the naira real exchange rate appreciated generally over the period 1974-84. This period indicates significant improvements in the TOT, reflecting substantial increase in the oil revenue accruable to Nigeria resulting from an increase in international oil price.

The nominal exchange rate also shows substantial depreciation over the period 1986-1993 following the introduction of the market-determined exchange rate system. Thus the substantial depreciation of the nominal exchange rate coupled with the observed declines in the TOT indices accounted for the observed depreciation of the RER during the SAP period. The statistical significance of the TOT and NOMDEV variables

implies that great stability in the two variables will produce a stable real exchange rate.

The performance of the monetary policy variable (MSP) is not in line with a priori expectation. This variable has a rather negative coefficient which appears to suggest that the effect of money supply growth has been to depreciate the RER. This might not however be unconnected with the fact that for most of the period covered, the percentage growth of money supply was very much higher than the rate of inflation, thus resulting in positive growth of the real money balances. For instance during the period 1973-1995, the average growth of the money supply was 20.3 percent compared to the rate of inflation which averaged 10.2 percent.

In the same direction the fiscal policy variable (FGE) has similar influence on RER to that of MSP. This is in contrast to Obadan (1994) findings that FGE has a positive effect on RER. The results shows that expansionary fiscal policy has similar effects to those of monetary policy. These macroeconomic policies were in line with SAP objective of achieving real depreciation of the RER in order to improve the trade balance and enhance international competitiveness.

The results also indicates that net private capital inflow (NCI) had a depreciating effect on the RER.

Finally, the degree of openness (OPN) representing the trade/commercial policy variable in line with a priori expectation showed that the effect of eliminating or reducing

export and import duties is to depreciate the RER. On the whole, the result shows that TOT and NOMDEV have relatively larger coefficients than the other explanatory variables. This implies that the impact of TOT and NOMDEV was dominant in causing the RER instability during the period of study.

4.4 CAUSALITY TEST

The OLS regression does not reveal the direction of the associative relationship among variables. In order to establish this the study adopted Granger test (Granger 1969) to test for the causal link between the dependent variable (RER), and each of the explanatory variables (TOT, NCI, MSP, NOMDEV OPN and FGE).

The following equations were used to test for the causal relationships between RER and each of the explanatory variables. The equations were in six forms and were given as;

$$RER_t = \alpha_o + \sum_{i=1}^{n} \alpha_i RER_{t-2} + \sum_{i=1}^{n} \beta_i TOT_{t-2} + \mu \quad \ldots\ldots\ldots\ldots \quad (1)$$

$$RER_t = \alpha_o + \sum_{i=1}^{n} \alpha_i RER_{t-2} + \sum_{i=1}^{n} \beta_i NCI_{t-2} + \mu \quad \ldots\ldots\ldots\ldots \quad (2)$$

$$RER_t = \alpha_o + \sum_{i=1}^{n} \alpha_i RER_{t-2} + \sum_{i=1}^{n} \beta_i MSP_{t-2} + \mu \quad \ldots\ldots\ldots\ldots \quad (3)$$

$$RER_t = \alpha_o + \sum_{i=1}^{n} \alpha_i RER_{t-2} + \sum_{i=1}^{n} \beta_i OPN_{t-2} + \mu \quad \ldots\ldots\ldots\ldots \quad (4)$$

$$RER_t = \alpha_o + \sum_{i=1}^{n} \alpha_i RER_{t-2} + \sum_{i=1}^{n} \beta_i NOMDEV_{t-2} + \mu \quad \ldots\ldots\ldots\ldots \quad (5)$$

$$RER_t = \alpha_o + \sum_{i=1}^{n} \alpha_1 RER_{t-2} + \sum_{i=1}^{n} \beta_1 FGE_{t-2} + \mu \quad \ldots\ldots\ldots\ldots \quad (6)$$

Where,

RER = Real exchange rate

TOT = Terms of trade

MSP = Growth of money stock

NCI = Net capital inflow

OPN = Degree of openness

NOMDEV = Change in nominal exchange rate

FGE = Federal Government Fiscal Deficit.

μ = an error term.

To implement Granger causality test in equations 1-6, F-statistics are calculated under the null hypothesis that the coefficients of the lagged values of each of TOT, NCI, MSP,OPN, NOMDEV and FGE are jointly insignificant (i.e in each equation, all $\beta_1=0$). If the null hypothesis cannot be rejected then the possibility that TOT, NCI, MSP, OPN, NOMDEV and FGE Granger causes RER changes cannot be rejected.
If the dependent and independent variables in equation 1-6 are reversed then the opposite hypothesis that RER determines the changes in the explanatory variables can be tested in the same manner.

The application of the Granger test requires covariance stationarity following conventional procedure, it is assumed

that stationarity is achieved by converting the data into logarithmic first difference (Engel and Granger, 1987).

The empirical results are summarized in Table 4.1

Table 4.1: Causal Link Between RER and TOT MOI, MSPC OPN, NUMDEV and PGE

Equation	1*	2	3	4	5	6	7	8	9	10	11	12	13
Constants	0.127336 (0.32507)	0.135476 (0.327202)	-0.0073 (-0.01859)	0.136938 (0.335595)	0.07058 (0.174593)	0.116031 (0.298378)	0.113435 (0.296965)	+070947 (+0.3616)	0.546183	-0.0095	-0.03169	0.008962	-0.13159
Variables													
∂LOGRER t													
∂LOGRERt t-1	0.363486 (1.440431)	0.379986 (1.408118)	0.378224 (1.530794)	0.400755 (1.474673)	0.366216 (1.389541)	0.360321 (1.432097)	0.202299 (0.684344)	-0.00649 (-0.03292)	-0.41658 (-0.94036)	-0.15567 (-1.11267)	-0.0434 (0.19043)	0.41496 (0.45534)	-0.19154 (-1.67991)
	-0.10421 (-0.40815)	-0.12172 (-0.4477)	-0.04035 (-0.15477)	-0.16651 (-0.59099)	-0.03954 (-0.14896)	-0.08847 (-0.34799)	-0.01505 (-0.05762)	0.107498 (0.540766)	-0.06183 (-0.13226)	-0.1444	-0.0467	0.1689	0.119712
∂LOGTOT t													
∂LOGTOT t-1	0.17947 (0.493509)							+0.06804 (0.2559)					
∂LOGTOT t-2	0.6195 (0.9568)							-0.0783 (-0.31184)					
∂LOGNCI t													
∂LOGNCI t-1		0.129922 (0.686495)							-0.45945 (-1.75171)				
∂LOGNCI t-2		0.246619 (1.563266)							0.099387 (0.37384)				
∂LOGMSP t													
∂LOGMSP t-1			-0.38003 (-0.67229)							-0.31131 (-1.38606)			

Table 4.1 continued

Equation	1	2	3	4	5	6	7	8	9	10	11	12	13
Constante	0.127336 (0.32507)	0.135476 (0.327202)	-0.0073 (-0.01859)	0.136938 (0.335595)	0.07058 (0.174593)	0.116031 (0.298378)	0.113435 (0.296965)	+070947 (+0.3616)	0.546183	-0.0095	-0.03169	0.008962	0.131
Variables													
∂LOGRER													
∂LOGMSP t-1				-0.38003 (0.87229)						-0.36927 (-1.72145)			
∂LOGOPN t-2				-0.07083 (-0.17009)									
∂LOGOPN i t													
∂LOGOPN t-1					0.186889 (0.634107)						-0.07608 (-0.29815)		
∂LOGNOMEV t					-0.33507 (-1.17555)						-0.0674 (-0.27313)		
∂LOGNCI t													
∂LOGNCI t-1						-0.66706 (1.03524)						0.202415 (0.867407	
∂LOGNCI t-2						0.79174 (1.271066)						-0.06708 (-0.38608	
∂LOGFDE t													
∂LOGFDF t-1							-1.02258 (-1.71288)						-0.7440 (-1.581

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Table 4.1 continued

∂LOGFGE t-2							-0.66867 (-0.904)						-0.6166 (-2.161
Statistics													
R^2	0.110092	0.124886	0.250389	0.153356	0.20645	0.22696	0.25822	0.629918	0.52534	0.346739	0.022428	0.223713	0.2754
N	20	20	20	20	20	20	20	20	20	20	20	20	20
t													
F(Q,N-K)		0.126788	1.403705	0.383262	0.910703	1.133851	1.497888	3.166373	0.583222	1.995179	0.065844	1.716653	1.50467
DF	17	15	15	15	15	15	15	15	15	15	15	15	15
S.E.	1.69898	1.793605	1.660016	1.764188	1.707975	1.685759	1.651323	1.911393	2.976389	0.908174	1.476765	.610593	0.673891

t values are in parenthesis

* Restricted Regression.

From the results in table 4.1, the F calculated for causal effects running from TOT to RER is 3.17 (in table 4.1). The F-statistics are calculated under the null hypothesis that the coefficients of the lagged values of the explanatory variables are jointly insignificant (i.e all $\beta_i=0$). At 5 percent level of significance the F tabulated (F_T) is 2.93. This indicates that the $F_c > F_T$ because 3.17>2.93, to that effect we accept the null hypothesis that TOT Granger cause changes in RER. This however does not indicate the direction or the sign of the causal link. This can be confirmed by summing the coefficients of the TOT variable to see whether the relationship is positive or negative. From equation 8, the sums of the coefficients of TOT is positive, which shows an existence a positive unidirectional causality runing from TOT to RER. This goes with the a priori expectation that TOT affects RER positively. An improvement in the TOT appreciates the RER while a deterioration in TOT depreciates RER. To test for the causal relationship from RER to TOT, the procedure is reversed. Equation 2 in the table 4.1 show that the Fc = 0.13 while the F_T = 2.93. Since $Fc<T_T$ it showed that RER does not Granger cause changes in TOT over the period of study. This may not be dissociated from the fact that the bulk of Nigeria's export trade (oil) is not affected by the RER. However, the sum of the coefficients in equation 2 provides a positive unidirectional relationship from RER to TOT.

Equation 9 test for the causal link between NCI and RER.

The Fc =0.58<F_T = 2.93, which signifies that NCI does not Granger cause changes in RER. The sum of the coefficients of NCI in the equation reveals a negative unidirectional relationship from NCI to RER. The inflow of capital has the tendency of depreciating the RER rather than the expected appreciation effect. Equation 3 reverse the test runing from RER to NCI. The Fc = 1.4< F_T = 2.93, the sum of the coefficients shows a positive unidirectional link runing from RER to NCI.

Equation 10 reveals the link between the money stock variable (MSP) and RER. It shows the Fc almost 2.0 against the F_T of 2.93. The Fc<T_T since 2.02<2.963, to this effect, we conclude that MSP does not Granger RER. But the sum of the coefficients of the variable showed a negative unidirectional relationship runing rom MSP to RER. This suggest that growth in domestic monetary stock depreciates the RER.

Equation II test for the causality runing from the degree of openness (OPN) to RER. From the equation Fc = 0.07<F_T = 2.93, which indicates that changes in OPN does not Granger cause change in RER over the period of study. However, the sum of the coefficients reveals a negative unidirectional relationship between OPN and RER. The opening up of an economy to the international trade by reducing or abolishing trade taxes has the tendency of depreciating the RER.

On the otherhand equation 5 reveals a positive unidirectional linkage runing from OPN to RER.

Equation 12 presents the result for causal effect from nominal exchange rate changes (NOMDEV) to RER. The results shows that Fc = 1.72<F_T=2.96. The sum of the coefficients of the variable (NOMDEV) is positive which signifies a positive unidirectional causal link from NOMDEV to RER. This supports Edward (1988) and Obadan (1994) that nominal exchange rate has a positive relationship with RER. Equation 6 shows a negative unidirectional causal link from RER to NOMDEV. A depreciation in RER causes depreciation in the nominal exchange rate. Finally equation 13 reveals the causality from GE to RER. The Fc = 1.50<F_T = 2.93 sum of the coefficients reveals a negative unidirectional relationship from FGE to RER. Expansionary fiscal policy has a negative effect on RER.

4.4 IMPLICATIONS OF THE RESULTS

It is apparent from the results of the OLS model that the model is well specified. The multiple correlation coefficient (R^2) computed is 0.74. Beside, the t-ratios computed indicates that the explanatory variables are statistically significant in explaining variations within the model. The results of the estimated modal produced evidence which supported the hypothesized relationship between RER instability and the instabilities in external and domestic fundamentals as specified in the model. Perhaps it will be worthwhile relating the findings of this study to those of previous studies.

From the results, the external fundamental influencing

the RER is the terms of trade (TOT) while the important domestic fundamental reflecting policy actions is the exchange rate policy changes. The statistical significance of the coefficients of TOT and NOMDEV suggests that the short-run fluctuations in RER is mainly as a result of fluctuations in TOT and nominal exchange rate variables. This then confirmed the fact that the substantial depreciation of the nominal exchange rate and decline in terms of trade indices during the SAP period accounted for the observed substantial depreciation of the RER. The results confirmed the findings of the earlier studies by Edwards (1994), Derick (1996) and Obadan (1994) that TOT and nominal exchange rate were the most important factors influencing changes in RER.

The result also provided evidence of a negative effect of monetary fiscal and trade/commercial policy on RER. The causality test establishes a positive unidirectional causal link from TOT to RER without a feedback effect. In the result, NOMDEV has the expected positive effect on RER. Other variables; NCI, MSP OPN and FGE provide a negative unidirectional relationship on RER.

On the whole the empirical results showed that the observed RER depreciation under the structural Adjustment Programme Period cannot be dissociated from the exchange rate monetary and fiscal policy effects. The inflationary effects of the policies have tended to undermine international competitiveness in no small measure.

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CHAPTER FIVE

SUMMARY, CONCLUSION AND POLICY RECOMMENDATIONS

5.0 SUMMARY

This thesis has undertaken an empirical investigation of the causes of Real Exchange Rate Instability in Nigeria during the period 1973-1996. Attempt has been made to identify the major factors inducing the variability in naira real exchange rate over the study period. Our study has been arranged into five chapters with each focusing on a definite goal.

Chapter one provided a background of the study. It introduced the research problems and discussed the aims, objectives and the research hypotheses of the study. In the review of literature in chapter two, both theoretical and empirical works on the area were reviewed. It was discovered that there were various explanations of the causes of RER variability. While others see external factors, terms of trade, and net capital inflow as factors causing RER changes, others identify domestic exchange rate, fiscal and monetary policies as the major factors affecting RER. There was however little empirical evidence to support this using Nigeria's data.

In an attempt to provide solution to the above problem, chapter three of this thesis considers the trends and development in Nigeria's exchange rate policy. Here it was discovered that over the study period, an appreciation of the

nominal exchange rate appreciated the RER and conversely depreciation in nominal exchange rate led to a depreciation in RER. The chapter further looked into the impact of RER changes on Nigeria's trade balance over the period in an attempt to expose the trends and performance of both the domestic macroeconomic and external trade policies in the economy. The chapter also presents the RER instability indices for the two broad periods, 1973-85 and 1986-96. The results showed a greater fluctuations in RER during the former period than the later.

Chapter four embodied the empirical analysis of the factors causing the variability of RER in Nigeria. The study adopted a simple OLS econometric model and Granger causality technique in its analysis. Our analysis confirmed Obadan (1994) findings that TOT and NOMDEV are the two major factors causing a greater percentage in RER changes. The two variables performed very well in terms of a priori expectation and statistical significance. The study attempted to identify the direction of the causal link between RER and each of TOT, NCI, MSP, OPN, NOMDEV and FGE, our findings confirmed a unidirectional positive causal link from TOT to RER without a feedback effect. It further showed a unidirectional positive relationship between NOMDEV and RER. Other variables (NCI, MSP, OPN and FGE) showed a negative unidirectional relationship with RER. This signified that each of the variables has a negative effect on the RER. The results in

the causality test revealed that monetary policy reinforced the observed depreciating effects of nominal exchange rate on RER. Expansionary fiscal policy tends to have similar effects.

5.1 CONCLUSION

The main conclusion of this study is that International TOT and domestic exchange rate, trade, monetary and fiscal policies are the major factors causing fluctuations in RER from the evidence using Nigeria's data. This was established statistically using OLS regression model and through Granger causality test. Domestic exchange rate, trade and monetary policies contributed significant depreciation of RER during the SAP period. The policies brought an inflationary effect which contributed in undermining the international competitiveness that the RER depreciation was supposed to enhance. Given the relative importance of the instability of TOT and nominal exchange rate (NOMDEV) variables in Nigeria's RER stability, policies aimed at stabilizing both the TOT and nominal exchange rate variables may be quite helpful in minimizing fluctuations in RER.

5.2 POLICY RECOMMENDATIONS

Based on the empirical findings, the study maked the following policy recommendations;

a) Since TOT is identified as one of the factors causing

RER instability there is need to stabilize the Nigeria's TOT. To stabilize the TOT there is need for Nigeria to balance her external account by producing more and consuming less tradable goods. This will lead to an increase in the price of tradable and subsequent depreciation in the RER.

b) The monetary authorities should put in place exchange rate management policy which follows a purchasing power parity approach, anchored on non-inflationary fiscal and monetary policies. This policy should aim at achieving both internal and external balance.

c) To stabilize the nominal exchange rate, which has a greater influence on RER stability there is a need to phase out the dual system of exchange rate and adopt a unified system of exchange.

d) There is also the need to put in place tight demand management policies such as restraint in the growth of money stock and prudent fiscal policy operations.

e) Also there is the need to have an expansionary monetary policy to support the government's expansionary fiscal operations. Monetary accommodation of fiscal excesses have often resulted in price increases, leading to the misalignment of the naira exchange rates. Although other factors also contributed to the growth in inflation, monetary impulses appear to be the strongest proximate determinant. The need to prevent domestic

prices from rising too far ahead of trading partners inflation rates, makes it imperative for fiscal operations to be restrictive.

f) The Central Bank of Nigeria (CBN) should be given autonomy to enable it pursue independent monetary and exchange rate policies within the overall framework of government macroeconomic policy objectives. This however does not mean that CBN should be given freedom to operate as it like. what it means is that after the government would have defined its broad policy objectives, the CBN should have a free hand to adopt the policy measures it deems fit to achieve monetary and exchange rates stability.

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