EXCHANGE RATE DETERMINATION IN NIGERIA; 1971-1990

BY

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APRIL, 1992

DECLARATION

I, SHARU RAMADAN UBA, declare that to the best of my knowledge, this dissertation is my original work and has not been submitted to any other university for examination. All references in this work have also been duly acknowledged.

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CERTIFICATION

The dissertation entitled "Exchange Rater Determination in Nigeria: 1971-1990" by Sharu Ramadan Uba meets the regulations governing the award of the degree of Master of Science (Economics) of Ahmadu Bello University and is approved for its contribution to knowledge and literary presentation.

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DEDICATION

This work is dedicated to my mother Hajiya Umma and Umma.

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The informal education I received during my early childhood, especially the sound literacy in Arabic script, was the basic foundation that supported and facilitated my subsequent formal education. I am grateful to my parents for their foresight in enrolling me into the school system of western education despite the environment in which I was brought up which, even though highly urbanised, was hostile to any form of western education at that time.

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ABSTRACT

The exchange rate policy introduced in Nigeria in September, 1986, aims at establishing the naira exchange rate based on the market conditions of demand for and supply of foreign exchange. The objectives of the policy are to diversify the revenue and foreign exchange sources to the government, reduce the over-valuation of the naira and improve the trade balance of the country. The controversies about the appropriateness of this policy of allowing market forces to determine the exchange value of the currency provide the inspiration of this study to enquire into whether Nigeria should continue, modify or abandon the policy of depending on market forces in determining the naira exchange rate.

This study looks at the Nigeria's exchange rate time path and evaluates the fluctuations in exchange rate which the foreign exchange market has produced since 1986. we have also used the X^2 tests to evaluate the responses of exports, imports and rate of inflation to the market exchange rate over the period.

The results of the dissertation show that the depreciation of the naira as a result of determining the exchange value of the naira through the foreign exchange market has failed to significantly reduce imports and boost the exports denominated in foreign.currency. The increase

in exports is only in nominal (naira) terms. The policy has also led to under-valuation of the naira as a result of which the rate of inflation has risen sharply and real income reduced. It has also led to currency speculations and these cause constant depreciation of the naira because of the limited supply of foreign currencies. From 1986 to 1990, when the exchange rate is determined through the foreign exchange market, there has been fluctuations of exchange rate and these are likely to distort long—term development plans and discourage both domestic and foreign investments.

As an alternative to the market-determined exchange rate, we suggest a weighted average of market-determined rate which is to be determined through the foreign exchange market and the purchasing power parity rate to be computed periodically by the central Bank of Nigeria. This will help to achieve the objectives of boosting the non-oil exports and reduce imports with minimum rate of inflation. There should also be more control and supervision of the authorised dealers in their sale of foreign exchange to customers to ensure strict compliance with central Bank's directives on allocation of foreign exchange according to sectoral priority.

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ABBREVIATIONS

BP. Balance of Payments

CBN. Central Bank of Nigeria

CPI. Consumer Price Index

ERA. Exchange Rate Adjustment

FEM. Foreign Exchange Market

GDP. Gross Domestic Product

IFEM. Inter-Bank Foreign Exchange Market

IFS. International Financial Statistics

IMF. International Monetary Fund

PPP. Purchasing Power Parity

SAP. Structural Adjustment Programme

SDR. Special Drawing Right

SFEM. Secondtier Foreign Exchange Market.

CHAPTER ONE

EXCHANGE RATE DETERMINATION IN NIGERIA: 1971-1990.

1. INTRODUCTION

Nigeria, like other members of the IMF, operated an adjustable peg system of exchange rate until the collapse of the Bretton Woods system in August, 1971. Subsequent to the Smithsonian realignment of currencies in December, 1971, Nigeria started pegging its currency to either gold or the pound and by 1974 the exchange value of naira was administratively being determined on the basis of changes in the values of selected group of currencies of different countries.[1] During that period, the flexibility of exchange rate was limited and it was the monetary authority, rather than market forces, that determined the exchange value of the naira using import weighted basket approach or relying on changes in the exchange rates of major currencies, the U.S. Dollar and pound sterling in particular. During the that period and up to September, 1986, when the policy was reversed to that of market determined exchange rate, the Central Bank of Nigeria, sometimes in collaboration with other government ministries, rationed and allocated the available foreign exchange at the rate that was determined

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1. Uzoaga, W.O. (1981) Money and Banking in Nigeria, Fourth Dimension Publishers, Enugu, P. 138.

and fixed by the authority. The rationing and restriction in the sale of foreign exchange, coupled with higher inflation rate in Nigeria than in her trading partners, indicated clearly that the demand for foreign exchange was higher than supply at the rate was being fixed by the CBN and that the foreign goods were cheaper relative to home goods. That discrepancy between the supply of and demand for foreign exchange brought about some distortions in the economy such as cheaper domestic prices of tradable-goods relative to the prices of non tradable-goods resulting in import dependency syndrome, and at the sametime the exports from Nigeria were expensive relative to those of the country's trading competitors. The low prices of export commodities discouraged the government policy of exports promotion while the policy of import-substitution did not achieve its desired objective due to low prices of imports.

In early 1980s the Nigerian government was convinced that the economy was in serious distortions as a result of disequilibrium exchange rate and that the only solution was to have a policy of gradual and continuous depreciation of the Nigeria's currency against the major international currencies in order to bring the exchange value of naira into purchasing power parity (P.P.P) with other currencies.

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Hence the naira depreciated by 5.6% and 16.8% in 1984 and 1985 respectively.[1] On 29th September, 1986, a fundamental change in the Nigerian economy was introduced when the Second-Tier Foreign Exchange Market (SFEM) came into operation. The first and second tiers of the market were later merged to form a new system called Foreign Exchange Market (FEM). The operation was once again modified into what is now called Inter-Bank Foreign Exchange Market (IFEM). The main objective of these institutional changes and arrangements that started with gradual naira depreciation and later culminated into market determined exchange rate was to obtain "a realistic" exchange rate in the country.

1.1 Nigeria's Exchange Rate Policy

During the exchange rate policy of the IMF adjustable pegged system, exchange rate policy in Nigeria was dormant, reacting only to dollar and pound sterling which were the intervention currencies, since the Nigerian currency was registered with the IMF as a non-trading currency. In the early 1970s, the "oil boom" enabled Nigeria to rapidly build up external reserves and this, coupled with rising inflation rates and floating of currencies in 1970s among the industrialised countries, forced Nigeria to devise ways

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1. International Financial Statistics, IMF. Vol. XLII No.5, May, 1969.

of preserving the purchasing power of the reserves. One of the methods used was to diversify the holdings of pound sterling into other stronger currencies such as Deutsche Mark and French Franc. The oil boom and its attendent healthy balance of payments position gave Nigeria so much sense of relief that management or conservation of foreign reserves was no longer among the targets of the government economic policies. Hence, exchange rate policy which at that time would have been a useful and effective instrument for switching demand away from foreign towards domestic goods and increasing Nigeria's non-oil exports gave way to the policy of price stability as the monetization of the oil revenues generated alot of inflationary pressures.

The intractability of the inflationary pressures was conspicuous in the early 1980s when the rate of inflation in Nigeria was perpetually higher than that of Nigeria's trading partners/competitors.[1] Government began to see disequilibrium in the economy as being caused principally by the external sector especially disequilibrium in exchange rate. Discussions and debates then began about going beyond the traditional fiscal and monetary policy

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1. International Financial Statistics, IMF. Year Book, 1987.

instruments to that of exchange rate adjustment so as to find a lasting solution to the Nigeria's economic problems which have been assumed to be exacerbated by over-depence on oil revenues and currency over-valuation.

The basic philosophy underlying the Nigeria's exchange rate adjustment (E.R.A) is reliance on market forces so that prices of both export commodities and non-export commodities would reflect their true scarcity values in the processes of promoting efficient allocation and effective utilization of resources.[1] The theory of efficient and effective allocation and utilization of resources requires that Nigeria produces those goods in which it has a comparative advantage. Since one of the objective of S.A.P., as various official pronouncements indicate, is to reduce the dependence on oil exports, then the objective of ERA would be diversification of the productive base of agricultural exportables in which the country is assumed to have a comparative advantage and whose elasticities of demand and supply are assumed to be high, in order to enhance the foreign exchange earnings from them. The ERA being a major component of SAP, is based on "the monetarist

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1. Ayodele, A.S. et. al. eds. (1988). Reflating a Depressed Nigerian Economy, Department of Economics, Ahmadu Bello University, Zaria.

philosophy which in its basic form insists that a capitalist economy when allowed to operate without government interference is capable of ensuring optimal allocation of resources and convergence to equilibrium after shocks".[1] This monetarist philosophy can be found in the monetary theory of exchange rate in which relative interest rates, money supply, real national incomes, inflation differentials, among other factors, determine the variability of exchange rate. This was unequivocally stated by the president in his 1988 budget speech:

> "After fifteen months of operating the foreign exchange market, we should be generally better informed about the facts, as against the fancies of exchange rate determination. Such facts include the demand for and supply of foreign exchange in the economy, the relative inflation and interest rates, the balance of payments and a host of subjective internal and external factors".[2]

The exchange rate adjustment, as various government pronouncements and policy statements indicate, was set out to achieve the following objectives:

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1. Kwanashie, M. "Fiscal and Monetary Components of Nigeria's Structural Adjustment Programme". Paper presented at the Conference on SAP and Future of Nigeria. C.S.E.R, Ahmadu Bello University, Zaria, March, 29-31, 1989.

2. Babngida, I.B. "Address to the Nation on the 1988 Budget", Lagos, 1st January, 1988.

(a) to correct the former system of inefficient allocation of the country's scarce foreign exchange through the forces of demand and supply so that naira would in the long-run find its real effective exchanger rate;

(b) to diversify and enhance the production of exportables so as to earn more foreign exchange and to reduce imports and thereby improve balance of trade;

(c) to attract capital inflow and discourage outflow;

(d) to encourage the production of more raw materials for national industries by boosting the naira price of such commodities, and hence raise the incomes of primary commodities producers.

(e) to eliminate the parallel (black) market currency trafficking and thereby reduce the incidence of smuggling;

(f) to restore the confidence of the World Bank and the IMF in the Nigerian economy so as to facilitate the rescheduling of the external debts and benefit from the fund's structural adjustment facilities and other soft loans.

1.2 Statement of Problem

Looking at the conventional indicators of growth, one might say the performance of the Nigerian economy was worse in 1980s than in 1970s. Throughout 1970s and

and up to early 1980s oil accounted for a significant percentage of GDP, over 60% of government revenues and over 70% of export earnings.[1] The Petro-dollar revenues of 1970s enabled Nigeria to meet her foreign exchange requirements without much constraint and enjoyed a healthy external reserves position. Oil revenues enabled Nigeria to achieve both internal balance and external balance to the extent that neither was much attention paid to the exchange rate being in equilibrium nor was policies, such as exchange rate adjustment, ever considered or used as instrument of diversifying the productive base of the economy in order to minimize any shocks that might result from a decline in oil revenues. In the 1970s and up to 1976, naira was under-valued vis-a-vis the U.S. dollar (according to the PPP criteria and with 1983 as a base year) indicating that the domestic price level had fallen relative to the price level in America. That deviation of exchange rate from the purchasing power parity rate encouraged the smuggling of goods from Nigeria to the neighbouring countries, especially the petroleum and agricultural products. From 1977 the naira was over-valued against the U.S. dollar and the degree of over-valuation increased greatly in subsequent years as a result of which the dorminant position which agricultural sector used to

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1. "Economic and Social Statistics Bulletin". Federal Office of Statistics, Lagos, 1986, Edition.

have in Nigerian economy was significantly curtailed. The over-valuation of naira in the middle of 1970s gave a negative protection to agricultural sector and eroded its significance in the economy from about 40% of GDP in early 1970s to 20% in 1980.[1] The absolute decline in agriculture of 0.4% a year and low producer prices for agricultural output which served as disincentive to farmers had created a food gap in the country and the need a rose for filling the gap through imports.[2] Wheat imports which were only 832 tonnes in 1977 rose to 1,517 tonnes in 1981, while rice imports followed similar trends during the same period.[3] In early 1980s Nigeria consistently faced both internal and external imbalances, with federal government budget deficits rising from ₦2.065 billion in 1981 to ₦4.942 billion in 1982 while the net outflow of foreign exchange was also in deficit, reaching ₦2,993.0 million in 1981.[4] The external reserves of Nigeria fell from ₦5,734.2m in June 1981 to ₦828.3m in May 1982.[5] These situations show the terrible consequence of

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1. Tobi, D. et.al, "Sacrifice and Pains as necessary cost of structural adjustment". SAP in a developing economy (eds) Phillips, A.O. and Ndekwu, E.C, NISER, Ibadan, 1987.
2. Ibid.
3. "Trade Year Book", Foods and Agricultural Organization of United Nations, 1981.
4. Osagie, E and Okogu, B.E. "Estimating a realistic exchange rate for the naira: PPP approach" paper presented at the workshop on aspects of SAP, held at Kuru, September 19-20, 1988.
5. Olukun, I.A. "An Appraisal of the SFEM" in Phillips A.O. and Ndekwu, E.C. (eds) Op.cit.

depending on oil as the only major source of foreign exchange and the misdirected policy of pegging the exchange rate despite the high rate of inflation and declining economic fortunes in the country.

Thus, the seemingly unresolvable external imbalance and its negative impact on the government finances was the immediate reason that forced Nigeria to look for a diversified source of foreign exchange so as to cushion the effect of any dramatic fall in oil revenue and to lay a strong foundation for a self-reliant economy. The option chosen and the instrument used by the government was the exchange rate adjustment so that the Naira could find its true-market value; this would help in curtailing the demand for foreign currencies thereby reduce the volume and value of the imports of the non-essential commodities as imports are made expensive and at the same time encourage people to produce goods locally both for domestic consumption and for export.

In this study we shall investigate the extent of the fluctuations of the exchange rates in Nigeria and their comformity or divergence from the purchasing power parity. We shall then be able to validate or disprove the notion that the naira was over-valued in the eve and after the introduction of the structural adjustment programme. We shall also investigate the extent to which the

current government policy of finding an equilibrium exchange rate has helped in improving trade balance and raising economic growth in Nigeria.

1.3 Objectives of the Study

The study is set out to achieve the following major objectives:

(a) examine and analyse the theoretical foundation of the Nigeria's new exchange rate policy;

(b) determine the extent of naira over-valuation/under-valuation from 1971 to 1988;

(c) evaluate the extent to which the major economic indicators respond to the Nigeria's exchange rate adjustment;

(d) identify the short-comings of the Nigeria's exchange rate policies/adjustment and make recommendations.

1.4 Justification

In specific terms, we

(a) evaluate the effectiveness of the current policy of determining the exchange rate through the foreign exchange market;

(b) provide a theoretical framework within which exchange rate determination/policies in Nigeria can be explained;

(c) determine the extent of the naira over-valuation/ under-valuation;

(d) provide an alternative approach for exchange rate determination in Nigeria.

1.5 Methodology

We are going to use the concept of the changes in the purchasing power of the naira domestically relative to that of U.S. dollar and pound sterling in their respective countries to calculate the purchasing power parity rates of the naira from 1960 to 1988. In a competitive foreign exchange market with an infinitely elastic supply of foreign exchange, the calculated purchasing power parity rates would coincide with equilibrium rates.[1]

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1. Osagie, E and Okogu, B.E. "Estimating a Realistic Exchange Rate for the Naira: PPP Approach.

On the basis of the purchasing power parity criteria, the degree of over-valuation/under-valuation of the naira would be established prior and after the introduction of the market determined exchange rate in 1986.

We shall also use the concept of coefficient of variation to determine if the degree of fluctuation of exchange rate is greater during the period of fixed exchange rates than the period of floating rates. The first period, which is a lengthy one, is from 1960 to 1985 when the exchange rates variations were slight while the second period, which is a short one, is from 1986 to 1988 when the exchange rates variations were large. X^2 distribution is also to be used to determine the effectiveness of market exchange rate in reducing imports and boosting exports in both local and foreign currencies.

1.6 Sources of Data.

We shall rely on secondary data from the Central Bank of Nigeria, Federal Office of Statistics, Federal Ministry of Finance and Economic Development, Manufacturer's A

ciation of Nigeria, The World Bank and International Monetary Fund publications and various economic and financial journals.

1.7 Limitations

In a less developed country like Nigeria, purchasing power parity approach to exchange rate determination has clearly some drawbacks since the economy is faced with inadequate supply of foreign exchange, capital movements and speculations among the authorised dealers who buy and sell the foreign exchange. Purchasing power parity approach is just one out of many approaches to exchange rate determination. Due to time factor and financial constraints we are not able to empirically apply other approaches to the Nigeria's situation.

OUT-LINE OF CHAPTERS

Chapter one is the general introduction, introducing the Nigeria's exchange rate policy. It also consists of the statement of problem, the objectives and justification of the study as well as its limitations.

Chapter two is a literature review. The exchange rate regimes are put into their historical perspectives and different approaches to exchange rate determination are reviewed.

Chapter three looks at the policy objectives of exchange rate policies in Nigeria. It also examines the exchange rate movements and their impact on macro-economic variables.

Chapter four is data analysis. Some foreign trader data of Nigeria are analysed using a χ^2 distribution and purchasing power parity rates computed.

Chapter five summarizes the study. Recommendations, which are based on the findings of the study, are given in this chapter.

CHAPTER TWO

2 LITERATURE REVIEW

This chapter consists of the theoretical framework and historical perspective on exchange rate regimes.

2.1 Historical Perspective.

We can basically classify exchange rate regimes into three: the gold standard, the IMF (Bretton Woods) system and managed floating.

I Gold Standard

The classical full gold standard was in operation by the middle of 19 century and continued up to 1914 when it was distrupted by the first "World War". The system required the monetary authority to convert even the smallest quantity of notes and coins into gold. The system of flexible exchange rate characterized the immediate post war period, with exception of the USA which returned to the gold standard immediately after the war. Britain, and very soon other nations, returned to gold standard in 1925. The second gold standard, which is known in the literature as gold bullion standard was in operation from around 1925 and continued up to early 1930s when it collapsed. Unlike in the first gold standard, the monetary authority, under the gold bullion standard, is obliged to convert paper money into gold bars of a minimum size - for

Britain each bar weighed a minimum of 400 ounces which worth about 1,560 pounds - so that there was no need of maintaining a gold reserve against internal note issue. Some countries chose to be on gold exchange standard, which was a system of keeping the reserves of a nation in currency of another nation which is on gold standard. Such countries were able to enjoy the benefit of earning interests by keeping their reserves in foreign currency which itself is convertible into gold.

The gold standard is basically a system of fixed exchange rate. under the system, the monetary authority of each nation set a par value of its currency interms of gold. Gold, which was the common denominator between the currencies of member nations, established a fixed relationship between member nations' currencies. This fixed relationship between national currencies in terms of gold was the exchange rate between the nations, or the mint parity as it was called under the gold standard. Adjustment occurs in the system by allowing deficits/ surplus to act on the volume of money.

II The Bretton Woods (IMF) System

After the world war II discussions began on how to evolve a new international monetary arrangement that would correct the short comings of gold standard and prevent

The destabilizing effect of flexible exchange rate. One of the reasons for the collapse of the gold standard was the failure to abide by the rule of the game of automatic adjustment (price-specie-flow mechanism) upon which the system was couched. Since the total money supply was determined by availability of gold in the country, then according to the rule of game a nation facing a deficit leading to outflow of gold would have to reduce its domestic money supply. A reduction in money supply in the deficit country would cause prices to fall while an increase in money supply in surplus country would cause prices to rise; in that way exports from a deficit nation become more competitive due to lower wages and prices while the exports of surplus nation become less competitive thereby making the adjustment automatic.

Because of the dissatisfaction with the past systems of exchange rate Keynes and White, representing the Britain and the USA respectively, wrote and circulated documents in early 1940s proposing for a new international monetary arragnements. In 1944, when the 44 member countries of the United Nations met at the Mount Washington Hotel, Bretton Woods, New Hampshire, to devise new international Monetary arrangements, the documents that dominated the conference's discussions were the British plan for an international clearing union, presented by Keynes and American plan for an international stabilization fund,

presented by Harry Dexter White.[1] After the extensive discussions on and redrafts of the Keyns and White plans at the Bretton Woods Conference, approval was then given to the articles of agreement for the International Monetary Fund (IMF) - an institution closer to White's plan than to Keyns'.[2]

Article IV required each nation to establish a par value of its currency interms of gold or US dollar and then keep its exchange rate within one percent of its par value. The rules allowed the fund to grant a request from a member country in a "fundamental disequilibrium" to change the par value of its currency. For a change of ten percent or less the prior approval of the fund was not required. The U.S.A., whose currency served as a key currency, fixed the parity of dollar in terms of gold at 35 dollar per ounce of gold and was obliged to buy and sell gold at the fixed rate so as to maintain the stability of the system. Other countries, on the other hand, allowed their currencies to fluctuate within the one percent margin and using dollar as the intervention currency to make sure that the rate did not deviate from the agreed margin. A country suffering from a balance of payments deficit leading to a downward pressure against its national currency was supposed to sell dollars at fixed rate to meet the excess demand of foreign exchange

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1. Meir, G.M. (1982) Problems of a World Monetary Order. Oxford University Press, p. 32.
2. Ibid, p. 41.

by her residents, and vice versa when the national currency tend to appreciate against the dollar.

In the case of inadequate foreign exchange available to the monetary authority, the country could draw from her quota in the IMF. The quota, which determined a nation's voting power and its ability to borrow from the fund, was established by article III and was based on the country's national income, its trade and its international reserves.[1] When the USA., the linch-pin of the system, faced the problems of depletion of her gold reserves which was triggered off by her persistent inflation and deficits, she suspended gold convertibility of the dollar in August, 15, 1971 and the system collapsed as a result of which currencies started to float. Despite the attempt by the group of ten when they met in Smithonian Institution, Washington, in order to revive the collapsed system, in which new parities were set by revaluation of a few currencies and devaluation of dollar as well as widening the margin of fluctuation from one percent to two and a quarter percent above or below the new par values, the USA deficits persisted and the system finally died out in March, 1973. Since then, a regime of floating rate (among the industrialised nations) emerged with interventions by the monetary authorities to limit the degree of fluctuation - dirty floating.

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1. Argy, V. (1981) The Post War International Monetary Crisis: An Analysis. George Allen and Unwin Ltd, London. p. 41.

III Oil Boom and "Dutch-Disease"

Nigerian economy increasingly became vulnerable to external shocks as oil emerged as the life wire of the economy. In 1970s when Nigeria depended heavily on oil for her foreign exchange requirements relationships between the balance of payments positions and conditions in international oil market were not established or contemplated by the policy makers until after the external base of the economy collapsed and external debts mounted up, and also a trend of balance of payments deficits emerged for many consecutive years. This situation corresponds to what is refered to in the literature as the Dutch-Disease, which is a situation in which a booming resource sector leads to a decline of the industrial sector via the loss of competitiveness due to appreciation of the domestic currency.

Following Olopoenia,[1] we shall analyse the effects of Nigeria's oil boom on the rest of the economy using the "Dutch-Disease" model. For the simplification of our analysis, we assume Nigeria produces non-tradable commodity called N and tradable commodity called T. The tradable commodity, T, is made up of traditional goods, such as

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1. Olopoenia, R.A. "A Preliminary Assessment of the Theoretical Foundation of SAP in Nigeria". Paper presented at the National Workshop on the SAP in Nigeria, Kuru, Jos. April 25th - 26th, 1988.

agricultural products or manufactured goods, which we shall call A, and non-traditional tradable commodity, which is oil, and which we shall call B. A boom in sector B would lead to an increase in real national income as well as increase in demand for both good N and A, leading to growth of GDP as long as neither the good N nor good A is inferior. However, since the prices of agricultural exports and exports of manufactured goods of the third world countries are determined by their world prices and nominal exchange rate, the increase in demand for the commodities in sector A cannot push domestic price higher than internationally determined price. But the increase in demand for good N would lead to increase in domestic production and the price of the commodity. The price of good N then becomes higher relative to that of good A, implying real appreciation of the naira.

With price of commodity A unchanged and that of commodity N higher than pre-boom level, commodity A will gradually lose its competitiveness in domestic production because of lower returns it yields relative to N and the country's resources will then be shifted from production of commodity A to that of N. The level of output in sector A (agricultural exports and exports of manufactured goods) will shrink and this will bring about what Olopoenia in his "Dutch-Disease" model called de-industrialization

and de-agriculturalization. Correcting the currency appreciation through exchange rate policy which allows the domestic currency to depreciate will lead to the expansion of sector A and possibly contraction of sector N. However, this might not be realised in case of the Nigeria's market-determined exchange rate due to some reasons which include rigidity of import coefficient and non-response of exports to increase profitability because of little technical flexibility.[1]

2.2 THEORETICAL FRAMEWORK

In this section we examine different approaches to exchange rate determination and the stability conditions of the foreign exchange market.

2.2.1 Approaches to Exchange Rate Determination

When the exchange rate is not fixed, a number of factors determine its changes. These include balance of payments position, domestic rate of inflation relative to that of other nations and monetary and fiscal policies. In order to investigate how these and other factors influence exchange rate movements, we are examining four approaches to the analysis of exchange rate behaviour. These are the purchasing power parity approach, Asset Market approach, Elasticity approach and Absorption approach.

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1. Olopoenia, R.A. Op.cit.

I Purchasing Power Parity Approach

The concept of the purchasing power parity was formulated by a Swedish economist, Gustov Cassel, as the theoretical basis for explaining and measuring statistically the new equilibrium exchange rates to be re-established after the first "World War". During the war trade among the European countries was disrupted and rates of inflation were generally high so that it became necessary to have a new set of exchange rates to ensure a more realistic basis for conversion of the European currencies after the war.

Two different versions of the PPP theory are distinguished in the literature: the absolute version and the relative version. Writing on the absolute version Cassel states:[1]

> "the rate of exchange between the two countries will be determined by the quotient between the general levels of prices in the two countries".

In other words, the exchange rate between two countries should equal the ratio of the price indexes in the two countries at every moment.

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1. Chacholiades, M. (1978), International Monetary Theory and Policy. Mcgraw-Hill Inc. p. 184.

Symbolically, if a = Nigeria; b = foreign country (U.S.A.) and e = exchange rate, then the absolute version of the PPP can be formulated as follows:

$$e = P_{a/P_b} \quad \text{..... eq. 1}$$

where P_a = the price index in the home country (Nigeria) and P_b = the price index in the foreign country (USA). Equation 1 implies, for example,that if the price level in Nigeria is ten times as much as the price level in USA , then one US dollar would be exchanged for ten naira i.e. exchange rate should be ₦10 : $1

With e denoting the logarithm of exchange rate and P and P* denoting the logarithm of domestic and foreign price levels respectively, the formulation in equation 1 can be re-specified as:

$$e = P - P^* \quad \text{..... eq. 2}$$

equation 2 states that the price of one unit of foreign currency in terms of domestic currency (exchange rate) at every time equals the rate of inflation differential between the two countries.

The relative version, on the other hand, is concerned with effects of changes on price levels on the intial equilibrium exchange rate, as it is stated by Cassel in the following quotation:

> "on the other hand, when we offer so and so much of our own money, we are actually offering a purchasing power as against commodities and services in our own country. 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 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..... This parity I call purchasing power parity". 1

If, for instance, compared with a base year when the exchange rate was in equilibrium, and in subsequent year prices have doubled in Nigeria and trebled in USA. Then according to the relative version the equilibrium exchange rate will have to change in the propertion 2:3. If the actual exchange rate is smaller than 2/3 of its original level, it implies an over-valuation of the naira.

We can formulate the relative version of the PPP symbolically as follows:

$$e_{1/e_o} = \frac{P_{a1/P_{ao}}}{P_{b1/P_{bo}}} \quad \text{..... eq. 3}$$

where,

e_o = initial exchange rate (base year)

e_1 = exchange rate in subsequent year

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1. Herin, J; Lindbeck, A and Myhrman, J (eds), Flexible Exchange Rates and Stabilization Policy. The Macmillan Press Ltd, London, 1980.

P_{ao} = Price index in nation A in base year

P_{a1} = Price index in nation A in subsequent year

P_{bo} = Price index in nation B in base year

P_{b1} = Price index in nation B in subsequent year

or simply,

P_{a1}/P_{ao} = domestic price index (in nation A)

P_{b1}/P_{bo} = foreign price index (in nation B)

so that equation 3 reduces to:

$$e_1 = e_o \times \frac{\text{domestic price index}}{\text{foreign price index}} \quad \text{..... eq.4}$$

Several authors applied the PPP empirically as a basis for either setting new exchange rates or determining the degree of under valuation/over valuation. At least three countries, namely United Kingdom, Czchoslovakia and Belgium were found to have used PPP as a basis for setting new exchange rates.[1] Ronald I. Mekinon computed PPP rates for nine European countries and USA from 1955 to 1977.[2]

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1. Officer, L.H. (1976), The Purchasing Power Parity Theory of Exchange Rates. IMF Staff Papers, March 1976.

2. Mekinon, R.I. (1979), Money in International Exchange: The Convertible Currency System. Oxford University Press Inc.

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Margaret G. de Vries computed regional PPP rates comprising of Africa, Asia, less developed countries of the Europe, Latin America, Middle East and more developed countries as a group.[1]

There are a number of problems in using the theory of purchasing power parity. In computing the relative PPP rates we need domestic and foreign price indices, as shown by the equation 4. The problem is that of appropriate price index to use. If we use the export price indices, then PPP would be a mere truism since for the prices of tradables, when determined by the market forces, the international prices would equal domestic price after allowing for transport charges and tariffs. If, on the other hand, the prices of tradables are not competitively determined, then these prices might not truelly reflect domestic costs, secondly, some structural forces, apart from the monetary factors may influence the foreign exchange market: these include changes in relative income, growth, changes in technology or changes in tastes at home or abroad. Thirdly, there is a problem of selection of a base year when the exchange rate is in equilibrium; such a year is supposed to be when the balance of payments is in satisfactory condition.

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1. de Vries, M.G. Exchange Depreciation in Developing Countries. IMF Staff Papers. Vol.15, No.31, November 1988.

Also there is the problem of causation as causation might run not only from relative inflation to exchange rates but also vice versa. For example, the massive depreciation of the naira after the introduction of the exchange rate adjustment in Nigeria led to higher rate of inflation which in turn caused further depreciations of the naira.

II Asset Market Approach

The asset market view considers exchange rate to be determined in the same manner as the determination of other asset prices. Joan Robinson went to the extent of justifying this view:

> "The traditional view that the exchange value of country's currency in any given situation depends upon the amount of it in existence is thus seen to be justified provided that sufficient allowance is made for changes in internal demand for money". 1

The approach focuses on asset adjustment rather than flow variables with exchange rate adjusting to equilib rate the international demand for national assets. There are many variants of this approach the popular of which are the monetary model and port folio-balance models. All the models of asset market approach to exchange rate determination share some common assumptions with the PPP. These common assumptions are absence

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1. Robinson, J. Banking Policy and the Exchanges. Review of Economic Studies, No.3, 1935-1936.

of transactions costs and trade controls.

According to one of the variants of the asset market approach to exchange rate determination, the exchange rate between any two currencies is determined by the relative supplies of and demands for money: this is a monetary approach to exchange rate determination. It makes assumptions analogous to that of PPP.[1] These are absence of transactions costs or capital controls, and that domestic and foreign bonds are perfect substitutes in the consumer demand functions. The model and its variants has been developed by exchange rate economists such as Frankel, Mussa, Girton, Roper, Hodrick and Bilson.[2]

Following Frankel, we derive the exchange rate equation of the monetary model below.[3]:

$$M = P + B_{1y} - B_{2i} \qquad \text{..... eq. 5}$$

where,

M = log of domestic money supply

P = log of domestic price level

Y = log of domestic real income

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1. Herin, J., Lindbeck, A and Myhrman, J (eds), The Flexible Exchanger Rates and Stabilization Policy. The Macmillan Press Ltd., London, 1980, p. 44.

2. Ibid., p. 87.

3. This Monetary Exchange Rate Equation is adapted from Frankel, J.A. Monetary and Portfolio-Balance Models of Exchange Rate Determination in Bhandari, J.S., Rutnam, B.H. and Levin, J.H. (eds), Economic Interdependence and Flexible Exchange Rates. The Massachusette Institute of Technology, London. 1983.

i = the domestic short-term interest rate

B_1 = the money demand elasticity with respect to income

B_2 = the money demand semi-elasticity with respect to interest rate.

We write the money demand function for the foreign country in similar manner with asterisks denoting foreign variables and assuming the parameters to be equal in both countries:

$$M^* = P+^* \quad B_{1y}{}^* - B_{2i}{}^* \qquad \text{..... eq. 6}$$

We take the difference of the two equations to get the relative money demand function:

$$(m-m^*) = (P-P^*) + B_1(Y-Y^*)-B_2(i-i^*) \quad \text{.... eq. 7}$$

The assumption of the model that foreign and domestic bonds are perfect substitutes gives us uncovered interest parity:

$$i - i^* = ed \quad \text{..... eq. 8}$$

where ed = the expected depreciation of domestic currency.

The uncovered interest parity in equation 8 implies that the asset holders are indifferent to the composition of their bond portfolios since with perfect bond substitutability, the expected rate of return on foreign bond, converted into local currency, is equal to expected rate of return on home bond. What matters to an asset holder in his portfolio investment is the expected change in the exchange rate.

Combining equation 7 and equation 8 and solve for relative price level will yield:

$$(P-P^*) = (M-M^*) - B_1(Y-Y^*) + B_2(ed) \quad \text{.... eq.9}$$

The assumption of perfect substitutability between domestic and foreign goods gives us ppp and implies that equation 2 holds. Thus, by implication, expected depreciation is equal to the expected inflation differential:

$$ed = ep - ep^* \quad \text{..... eq. 10}$$

where ep and ep* denote expected inflation in domestic and foreign country respectively.

We can now combine equations 2, 9 and 10 to get the monetarist equation of exchange rate determination.

$$e = (M-M^*) - B_1(Y-Y^*) + B_2(ep - ep^*) \quad \text{.... eq.11}$$

Equation 11 says that the exchange rate, being the relative price of currency, is determined by relative changes in money supply, real income and expected inflation differential. An increase in the domestic real income or a decrease in the expected inflation rate, raises the demand for domestic money and leads to appreciation.[1]

Various variants of the monetarist exchange rate equations have been estimated econometrically by various

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1. Frankel, J.A. Monetary and Portfolio-Balance Models of Exchange Rate Determination. In Bhandari, J.S. and Rutnam, B.H. (eds) Op.cit.

such as exchange rate variability. Investors, for instance, diversify the risk associated with floating exchange rate by balancing their bond portfolio between domestic and foreign bonds in proportions that depend on the expected relative rate of return.

III Elasticity Approach

The elasticity approach focuses on the reaction of balance of payments subsequent to an exchange rate change and it is based upon satisfying what is known in literature as Marshall-Learner condition. According to the approach, to know the effects of devaluation, we have to examine the home elasticity of demand for imports and foreign elasticity of demand for the country's exports. The Marshall-Learner condition, with specific reference to Nigeria and USA can be formulated as follows.[1]

$$\frac{dB}{de} = -x(E_{NI} + E_{Ue} - 1) \quad \text{.... eq. 12}$$

where,

dB = change in balance of payments

de = change in exchange rate

$\frac{dB}{de}$ = change in balance of payments as a result of exchange rate changes

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1. Heller, H.R. (1974), International Monetary Economics. Printice-Hall Inc., p. 95.

X = volume of exports

E_{NI} = Nigeria's elasticity of demand for imports of USA

E_{Ue} = USA elasticity of demand for Nigeria's exports.

With $\frac{dB}{de}$ being negative, then devaluation will improve Nigeria's trade balance if the term in the brackets is positive, i.e. $E_{NI} + E_{Ue} > 1$.[1] This is known as Marshall-Learner condition and it states that for a normal reaction of the trade balance to exchange rate changes the demand elasticities have to sum to more than one. This condition is sufficient but not necessary for improvement in trade balance. The success of exchange rate depreciation will depend upon satisfying the following conditions.

A country must have an elastic foreign demand for her exports so that the devaluation will have the positive impact of raising the exports significantly and thereby improve trade balance. with low elasticity of demand for domestic exports, the fall in export prices might not increase the volume of exports.

Cline, W.R. (1976), The international monetary Reform and Developing Countries. The Brookings Institutions, Washington, D.C.

Home supply of exports must be elastic so that more could be produced domestically and exported. If the domestic supply of exports is inelastic there will not be an increase in volume of exports despite the fall in export prices as a result of depreciation.

On the imports side, the demand must be elastic so that the increase in prices of imports as a result of depreciation would force individuals and firms to curtail their imports by looking for local substitues. However, if the demand for imports is inelastic, such as essential goods with no local substitutes, the same quantity will continue to be imported at higher costs. Hence, trade balance will not improve.

With perfectly elastic foreign supply the foreign suppliers can divert their supplies from the country which resists importation of their goods as a result of depreciation to some where else. In this case there may be improvement in trade balance. If, on the other hand home market absorbs a large share of total foreign supplies, the resistance of home consumers against imports as a result of depreciation could force foreign suppliers to accept reduction in foreign price of imports. In this case the price of imports in local currency will rise by less than the amount of depreciation and the volume of imports may therefore not be significantly curtailed.

IV Absorption Approach

The approach was developed as an alternative to the elasticity approach by sidney S. Alexander (1952) who considered aggregate income and expenditure of a nation as crucial in evaluating the effects of currency adjustment. Debunking the elasticity approach, Alexander observes:

> "The most important reservation against the use of the Marshallian supply and demand curves in the analysis of the effects of a devaluation arises from the complex of the relationships which govern the supply and demand conditions in international trade. The elasticities for which the conventional formulas are valid must be defined as total elasticities and not as partial elasticities".1

According to Alexander, for a devaluation to succeed, there must be an increase in income (output) or a decrease in expenditure or both two. The approach starts from taking a balance of trade (B) as a difference between total goods and services produced in the nation, which is refered to as national income (Y) and total goods and services taken off the market domestically, which is refered to as total expenditure or absorption (A). Balance of trade can then be written as:

$$B = Y - A \qquad \ldots\ldots \text{ eq. 13.}$$

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1. Allexander, S. Effects of Devaluation a Trade Balance. IMF Staff Papers, No.2, Vol.II, 1952.

Devaluation can affect change of trade balance in only two ways: through a change (increase) in national income or a change (decrease) in real absorption associated with any given level of real income.

Denoting changes in these quantities by d, we can write equation 13 as:

$$dB = dY - dA \quad \text{..... eq. 14}$$

Equation 14 indicates that a change in trade balance (dB) is the difference between a change in income (dY) and a change in absorption (dA). The first task of Alexander was to investigate how the devaluation will affect the two terms of equation 14, dY and dA.

The effects of devaluation upon absorption will show in dA which we can break into two parts: income-induced change in a absorption, dY, which in turn depends on price level or other factors related to devaluation (which we call C) and the other part which is non-income-induced or direct effect of devaluation upon absorption to be called dD. Then our total absorption, dA, can be written as:

$$dA = cdY - dD \quad \text{..... eq. 15}$$

combining equation 14 with equation 15 we get:

$$dB = (1-C)\, dY + dD \quad \text{..... eq. 16}$$

Equation 16 is the Alexander's basic formulation highlighting the factors that affect trade balance as a result of currency depreciation. These factors are the effect on income, dY, the effect on propensity to absorb, C, and the effect on direct absorption, dD.

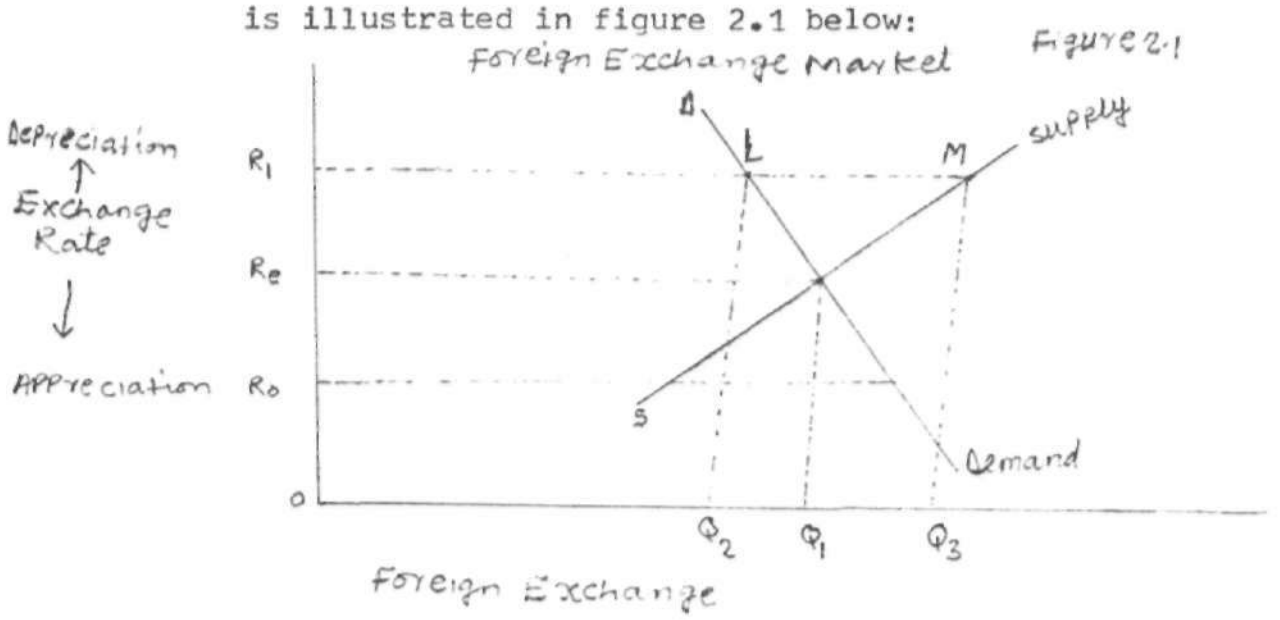
The increase in income and production that is brought about by devaluation is the difference between the increase in total production and the induced increase in total absorption and this he called hoarding. The trade balance by equation 16, equals aggregate hoarding of the whole economy so that the income-induced change in trade balance equals income-induced change in hoarding i.e. change in income, dY, multiplied by the propensity to hoard, I-C. If $C < I$, then $(I-C)\,dY > 0$ so that there is some hearding and devaluation under this condition is expected to have a favourable effect on production, employment and balance of payments. If C is equal to or greater than one, which means the economy is already at full employment, increased output brought about by devaluation will not improve trade balance except through the direct effect on absorption, dD. In this case trade balance can only increase through a reduction in domestic absorption of income and an equal increase in exports or reduction in imports.

2.2.2 Foreign Exchange Market Stability Conditions.

Foreign exchange market is defined as an institutional arrangement in which individuals, firms and financial institutions buy and sell foreign currencies.[1] When Nigerians, for instance, export goods to America, the foreign exchange market enables the American importers to pay for the goods in dollar while the Nigerian exporters are paid in naira. In this case, we say there is a demand (by the Americans) for the Nigeria's naira and supply of the American dollar for paying the Nigerian exporters.

In the market approach to exchange rate determination the market is conceptualised as having demand and supply functions, with the equilibrium exchange rate being determined by the intersection of the two functions. This is illustrated in figure 2.1 below:

Figure 2.1



1. Salvatore, D. (1975) Theory and Problems of International Economics. Mcgraw-Hill Book Company.

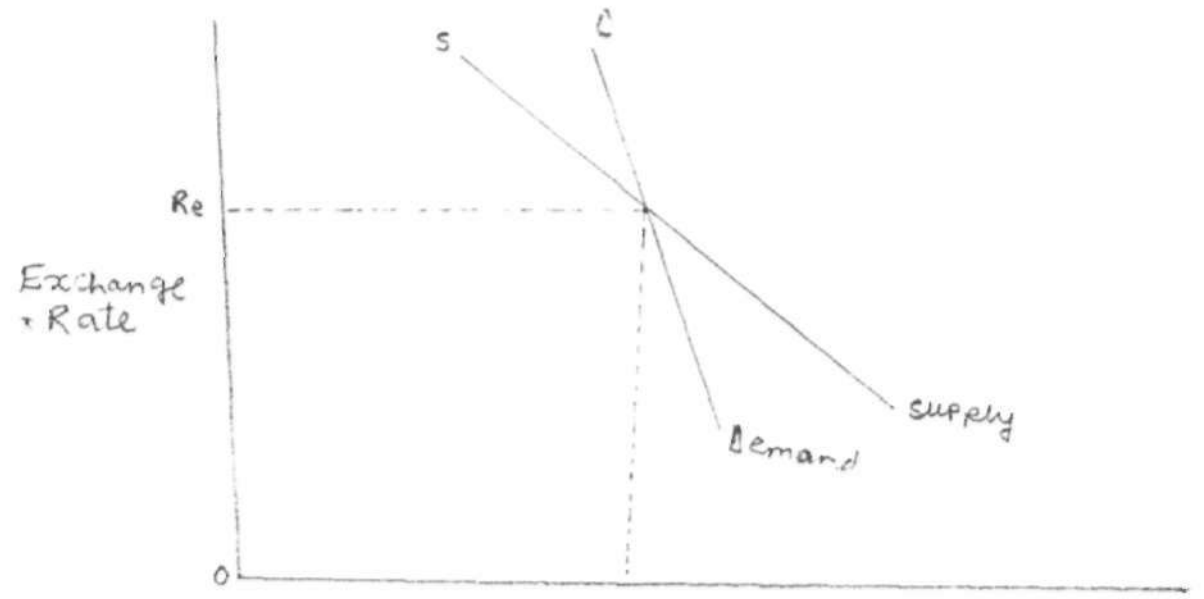
In figure 2.1, the vertical axis represents the exchange rate which is the cost of foreign currency in terms of domestic currency. The horizontal axis represents the volume of foreign currency demanded or supplied. The demand curve represents the demand for foreign exchange, and the supply curve represents the supply (The demand for and supply of foreign currency are simply the monetary reflection of imports and exports of goods and services). At an exchanger rate Re, the demand for and supply of foreign currency are in balance, and the volume of transactions is Q_1. If the domestic currency depreciates, or exchange rate is fixed at a level higher than Re such as R_1 in figure 2.1, then foreign exchange will cost more. At R_1 the quantity of foreign exchange demanded will be Q_2 while the quantity supplied (representing the proceeds of export sales) will be Q_3. The balance of payments surplus will be $Q_3 - Q_2$ as represented by the line LM. The excess supply of foreign exchange represented by the line LM will cause the price of foreign exchange to fall until equilibrium is restored, and vice versa if the exchange rate is lower than Re.

Exchange rates as determined in figure 2.1 are capable of removing external deficits/surplus only if the foreign exchange market is stable. Foreign exchange market is stable if the demand and supply functions have the right

slopes and elasticities, which in turn are determined by other institutional and technical conditions in the economy.[1] Where such stability conditions are not satisfied, an attempt for external adjustment through the depreciation/appreciation of the domestic currency will not succeed as illustrated in figure 2.2.

Unstable Foreign Exchange Market

Figure 2.2



1. Kindleberger, C (1973), International Economics, Homewood, Irwin.

Foreign exchange market as illustrated by figure 2.2 is unstable because the supply curve is negatively slopping and flatter (more elastic) than the demand curve at the equilibrium point. At an exchange rate higher than the equilibrium rate R_e, the amount of foreign exchange demanded is greater than the amount supplied implying a deficit in the balance of payments. The excess demand of foreign exchange will cause the price of foreign exchange to rise and exchange rate to depreciate further and the deficit becomes even larger. So also the reverse if the exchange rate is lower than the equilibrium rate. Therefore a movement away from the equilibrium rate R_e in figure 2.2 automatically moves us even further away from R_e, hence the foreign exchange market is unstable.

In countries with unstable foreign exchange markets attempts to remove the undervaluation and overvaluation of the domestic currency through the exchange rate adjustments in order to have a viable balance of payments position may not achieve the desired objective.[1] Empirical work by Ajilima and Agba points to the existence of unstable conditions in the Nigerian foreign exchange market.[2] Hence, there is the need for caution in implementing the exchange rate adjustment in Nigeria.

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1. Olopoenia, R.A. "A preliminary Assessment of the Theoretical Foundation of SAP in Nigeria. Op.cit.
2. Ajilima, I and Agba, V.A. (1986), The Second-Tier Foreign Exchange Market as a Catalyst to non-oil Exports. The Nigerian Journal of Economic and Social Studies, Vol.28, No.1.

CHAPTER THREE

3 NIGERIA'S EXCHANGE RATE POLICIES

3.1 Policy Objectives

The first foreign exchange regulation in Nigeria was Exchange Control Act of 1950 in which two different areas were designated for the purpose of foreign exchange transactions: the sterling area which was free of control and non-sterling area which was defined as foreign area and therefore subjected to regulations. Two years after independence, Nigeria's external reserves declined from ₦343.3m in 1960 to ₦250.6m in 1962 or by 27%. Against this background, the 1958 CBN Act in which the CBN was required to hold external reserves only in gold and sterling was amended. Under the new arrangement, the CBN was required to maintain the foreign exchange reserves in the form of or combination of the following assets:[1]

(i) Gold coin or bullion

(ii) Bank balances

(iii) Bills of exchange

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1. Falegan, S.B. Management of Nigeria's External Reserves. NIIA Lecture Series, No. 6.

(iv) Government or government guaranteed securities of not more than 10 years maturity.

(v) Treasury bills

(vi) Securities of international financial institutions of which Nigeria is a member, provided such securities have a maturity of five years or less.

(vii) Gold tranche with the IMF.

The exchange control act was also promulgated in 1962 so as to conserve foreign exchange and improve balance of payments position. The new law removed the favourable treatment accorded to the sterling area by defining all currencies other than Nigerian pound sterling as foreign and all residents of countries other than Nigeria as non-residents.[1]

In early 1970s oil started assuming greater importance in Nigerian economy and taking increasingly greater share of Nigeria's total exports and revenue earnings. The substantial increase in oil revenues and their monetization enabled Nigeria to enjoy a fiscal balance and favourable trade balance for most of the years in that decade. However, despite the favourable trade balances, the over-all balance of payments suffered great fluctuations,

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1. Swammy, M.R.K. "Focus on Demonetization of the Nigerian Naira" in Nigerian Journal of Financial Management, Institute of Management and Technology, Enugu. Vol.4, 1985.

plunging into deficits in 1972, 1976, 1977 and 1978 (see Table 3.1). Hence, as one of the earliest expenditure switching policies, naira was devalued by 10 percent in 1972 in order to conserve foreign exchange.[1] The world wide floating exchange rate that started in 1973 posed a serious problem to the Nigeria's exchange rate policy since the depreciation of the dollar or pound sterling, the currencies to which naira was anchored, would invariably lead to the depreciation of the naira against major trading currencies even when the country was experiencing a rapid accretion of external reserves. The continued pegging of naira to the dollar and pound sterling and the new developments in the global exchange rates policy had serious adverse impact on the Nigerian economy that the CBN observed:

"The structure of the export trade was not such that the country could benefit from any competitive advantage that continued depreciation could have brought about - although the naira equivalent of non-oil export earnings would as a result, be higher. With respect to imports, the naira prices of imports from countries other than the the United States and United Kingdom continued to rise with the attendant adverse effects on domestic price level".[2]

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1. Uzoagu, W.O. (1981), Money and Banking in Nigeria. Fourth Dimension Publishing Co. Enugu, p. 174.

2. Twenty Years of Central Banking in Nigeria 1959-1979. CBN, Lagos, 1979, p. 172.

In view of the inherent disadvantage in the above policy, the monetary authority decided from April, 1974 to implement an adjustable peg exchange rate system in which the naira would be managed independently of the US dollar and other currencies. This involved the pegging of the naira to some currencies.

By 1977, the external assets declined from the 1976 level and the exchange rate depreciated. The decline in foreign assets necessitated the need for external borrowing in order to maintain the current import level and external debt was so serious that as early as in 1977 Nigeria was one of the 17 countries whose external debt was too large relative to their GNP or their export earnings.[1] In order to halt the foreign exchange crisis that was imminent in 1977, the foreign Exchange Anti-Sabotage Decree of 1977 was promulgated so as to punish and prevent foreign exchange saboteurs but, that notwithstanding, the foreign assets in that year declined further and exchange rate depreciated. With effect from February, 1978, the naira was pegged to a system of import-weighted basket of seven major trading partners of Nigeria with

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1. Margaret, G. de Vries. The IMF 1972-1978 Narrative and Analysis. IMF, 1985, p. 928.

weighs assigned to each of the seven currencies based on the volume of each country's trade with Nigeria.[1] From that time, changes in the exchange rate took cognisance of many factors, viz, the balance of payments position, level of foreign exchange reserves, rate of inflation and movement in the foreign markets of the currencies of Nigeria's major trading partners, especially the US dollar and pound sterling.

The crash of prices in the international crude oil market in 1981 and the resultant short fall in foreign exchange earnings coupled with the emergence of serious balance of payments and external debt crisis, forced the monetary authority in Nigeria to embark upon a policy of gradual depreciation of the naira in relation to other currencies. But the administrative depreciation of the naira failed to correct the problems that bedevilled the economy which were assumed to have been caused by the unrealistic exchange rate. Consequently, the second-tier Foreign Exchange Market (SFEM) was introduced on September 26, 1986 within the framework of Structural Adjustment Programme (SAP), with a view to achieving a market determined realistic exchange rate.

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1. Obadan, M.I. Exchange Rate Policy and Impact on the economy. A paper presented at the Training Programme organised by National Centre for Economic Management and Administration (NCEMA) October 20-November 15, 1991.

The introduction of SFEM marked the beginning of a floating exchange rate regime in the country. A floating exchange rate system is one in which the exchange rate is determined by the market forces of demand for and supply of foreign currency. In the system of floating exchange rate the currency is allowed to find its level in the market without government control or intervention. However, Nigeria's current exchange rate system is a managed float or dirty float like that of other countries operating floating exchange rate regimes. It is managed float because the monetary authority sometimes intervenes to keep the exchange rates within the desired limits. The SFEM exchange rate system began as a dual exchange rate system comprising the official first tier rate and the SFEM or free market rate. The former was administratively determined and applied to a few official international transactions such as debt servicing. The free market rate which applied to the rest of transactions was determined by market forces of demand and supply within the framework of a foreign exchange auction system. The objective of having a two-tier system was to avoid a deliberate uniform and large devaluation of the naira but to allow it to depreciate gradually in the SFEM while at the same time the government continued a downward adjustment of the first-tier rate until the two rates converged to produce a realistic exchange rate.

This convergence was achieved on July 2, 1987 at an exchange rate of ₦3.74 : $1.00.

Since its inception in 1986, the SFEM has metamorphosed into the Interbank Foreign Exchange Market (IFEM) since January 1989. During the period, the foreign exchange market has experimented with various techniques and operational procedures among which are the average and marginal exchange rate methods, the Dutch Action system and the weekly, fortnightly and daily bidding system. All these changes and reforms have been tried with the aim of finding a realistic exchange rate of naira which was believed to have been over-valued in 1980s.

3.2 Impact on Exchange Rate

Contrary to the colonial version of the pre-colonial Nigeria's history, inter-regional trade was wide spread before the colonial domination with variety of currencies, such as gold, copper wire, iron rods, cowrie shells and commodity Currencies being used as media of exchange. Later on, especially after the commencement of the merchantalist imperialism, these currencies were supplemented by other foreign metal currencies such as American-eagle, Spanish doubloon, Austrian Maria Theresa dollar, French Napoleon and British sovereign.[1]

1. Okigbo, P.N.C. (1981), Nigeria's Financial System, Structure and Growth. Longman Group, London, p.75.

With Britain in colonial control of what is now known as Nigeria, policies were put in place through various legislations in order to demonetise all other currencies and allow the British currency as the only legal tender in the country.

When the Nigerian pound was introduced in 1959, it was fixed at par value with a pound sterling and it was exchanged for US $2.80. With Nigeria becoming an independent nation and her subsequent joining of the IMF on March 30, 1961, the par value of the Nigerian pound was defined in terms of gold in 1962 at ₦2.48828 gramms of fine gold.[1] On November, 1967, the pound sterling, the currency to which the Nigerian pound was pegged, was devalued against the US dollar but Nigeria decided to maintain the existing gold content of her pound, which in effect meant appreciation of the Nigerian currency against sterling. When the USA unilaterally suspended gold convertibility of dollar in August 1971 and major currencies subsequently started floating against the US. dollar, the Smithsonian conference was convened for the realignment of currencies in which the dollar was devalued by 8.57%. But Nigeria maintained the gold content of her

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1. Twenty Years of Central Banking in Nigeria: 1959-1979. CBN Lagos, 1979, p. 72.

pound sterling which implied appreciation of the Nigerian pound against the dollar by 8.57%. A few months after the smithsonian agreement Britain returned to floating rate and that resulted in the termination of the fixed relationship between the Nigerian pound and pound sterling while the fixed relationship with the dollar continued.[1] With effect from January, 1973, Nigerian currency was decimalised with the naira as the new currency which was equivalent to a half of the former pound.

In line with the Nigeria's new exchange rate policy in which the balance of payments position and level of external reserves are among the factors determining exchange rate, the naira appreciated by 4.4% and 2.1% in 1974 and 1975 respectively as a result of rising external reserves (see Table 3.2). The level of the external reserve declined in 1976 and the currency accordingly depreciated by 1.8%. In 1977, the external assets declined from the 1976 level and the exchange rate depreciated again.

At the beginning of January, 1980, the exchange rate was US $1 : ₦0.5605 but by the end of the year naira appreciated by 2.9% (i.e. $1 : ₦0.5445) which was a reflection of the continued dollar depreciation against

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1. Ibid., p. 173.

major currencies that started since 1978.[1] The naira pound exchange rate, on the other hand, changed from £1: ₦1.2362 at the beginning of January, 1980 to £1 : ₦1.2739 at the end of the year (naira depreciation of 3 percent) which was a reflection of the pound sterling appreciation against major currencies.[2] Despite of the recession of 1981 that was brought about by the collapse of oil prices, the naira - sterling exchange rate was kept fixed in the first half of 1981.[3] However, the exchange rate was variable against the dollar which was due to instability of the exchange rate of the US dollar against the major currencies.[4] Exchange rate in 1982 was less administratively determined than previous years. Internally, the decline in foreign exchange earnings and external reserves in 1982 eroded the strength of the naira as a result of which the naira depreciated against the dollar by 5.9% but appreciated against the sterling by 13% due to the sterling's relative weakness.[5]

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1. Williamson, J (1985), The Exchange Rate System. The Institute for International Economics, Washington, DC p. 98.
2. Ibid.
3. Annual Report and Statement of Accounts, for the year ended 31st December, 1981. CBN, Lagos.
4. Ibid.
5. Ibid., for the ended 31st December, 1982.

The recovery of the US economy led to the appreciation of the dollar against major currencies in 1983. With Nigerian economy still in recession in 1983 the naira depreciated by 10% against the US dollar in that year while it was steady against sterling because of pound sterling's continuing weakness against the dollar. With interest rate still high in USA and balance of payments in surplus in 1984, the dollar continued its appreciation against major currencies as a result of which the naira depreciated against the dollar by approximately 7.4% while it depreciated against the pound sterling by less amount because of the sterling's depreciation against the dollar.[1] By 1985 the Nigerian government was convinced that gradual depreciation of the naira was inevitable in order to restructure and diversify the economy. Hence, the naira exchange rate adjusted downward 26 times in 1985, with the naira dollar rate depreciating from ₦1 : $1.2046 at the end of January, 1985 to ₦1 : $1.0004 at the end of December, 1985.[2]

Developments in the exchange rate movements in Nigeria reveal that government policies, changes in the exchange

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1. Ibid for the year ended 31st December, 1985.

2. Aluko-Olokun, I. An Appraisal of the Secon-Tier Foreign Exchange Market (SFEM), in Phillips, A.O. and Ndekwu, E.C. (eds) Structural Adjustment Programme in a Developing Economy, NISER, Ibadan, 1987.

rates of major currencies especially US dollar and pound sterling as well as the balance of payments position influence the naira exchange rate. Although the policy of gradual depreciation of the naira commenced since early 1980s, it was after the introduction of the market determined exchange rate in 1986 that serious attempts to establish real effective naira exchange rate began.

3.3 Impact on Macro-economic Variables

Marked exchange rate determination, especially after the introduction of SAP in 1986, has had a number of effects on the Nigerian economy. The adjustment was set out to achieve certain objectives among which are:

(a) reduce the country's dependence on imports of raw materials and consumer goods;

(b) enhance the production of the exportables so as to increase the Nigeria's foreign exchange earnings;

(c) reduce the dependence of the country on oil as a source of export earnings and,

(d) increase the level of foreign reserves and bring about a balance of payments equilibrium.

The approach we shall use in this section is to analyse the impact of the market exchange rate on certain key economic variables using a "before and after method of analysis". A shortcoming of this descriptive "before" and "after" method is that it does not explain to us causality among the variables. However, it allows

us to see the extent to which the objectives of the adjustment are achieved or failed.

(a) Gross Domestic Product (GDP) and its Components

Determination of the exchange rate by the market forces as contained in SAP document, is to limit the growth of domestic aggregate demand and boost supply. The aggregate demand consists of demand for goods and services by consumers, government, businesses and export buyers abroad while aggregate supply refers to the total supply of goods and services. Towards this end, depreciation of the naira was expected to raise import prices and thereby rationalize individual and national consumption patterns away from non-essential imports to the consumption of domestically produced items. Thus, by determining the relative prices of tradable and nontradable, exchange rate will help to achieve the realignment of domestic production with consumption patterns. The import component of aggregate supply is expected to decline as a result of higher costs of imports while domestic output supply is to increase as a result of increased local demand.

The index of industrial production for all the sectors in 1986, as shown in Table 3.6, stood at 166 (1972 = 100). This shows a decline of 2%. However, there are marginal increases in 1987, 1988 and 1989. This development is an

indication that the deregulation of foreign exchange disbursement had enabled industrial sector to import its raw materials and spare parts thereby increase industrial production. The positive impact of the adjustment on the Nigerian economy was its ability to discourage industries which produce goods with high import content and how it gave incentive to industries whose products have high local value-added. In this direction, the index of manufacturing production (1972 = 100) shows a dramatic decline from 1986 to 1989 for those industries that depended on foreign inputs, such as vehicle assembly plants as well as radio and T.V. For the vehicle assembly the index dropped from 1344.1 in 1985, a year prior to the adjustment to 239.6 in 1989, decline of 82% (see Table 3.7). The index for radio and T.V. declined from 367.6 in 1985 to 24.2 in 1989, a decline of 93%. The index of cotton textiles, on the other hand, shows an upward trend: it rose from 44 in 1986 to 148.4 in 1989, indicating the ability of the cotton sub-sector to utilize local raw materials in its production matrix. On the aggregate, the index of manufacturing production shows upward trends since the commencement of the market determined exchange rate although the increases were only marginal, as Table 3.7 shows.

Despite the marginal increase in manufacturing production, mining and electricity supply during the period of the market exchange rate determination, one has

to be cautious in interpreting this development since an increase in industrial capacity utilisation may not necessarily imply either an efficient allocation of the country's scarce foreign exchange or achievement of an equilibrium exchange rate. The de-control of foreign exchange market, for instance, has encouraged the importation of finished goods rather than raw materials and producer goods, as a result of which the share of finished goods sector to the total foreign exchange allocation under SFEM rose from 17% at the end of the 8th auction (13/11/86) to 24% at the end of 21st auction.[1] It has also been observed that over 70% of foreign exchange at the SFEM allocated to the industrial sector was used for the importation of finsished goods rather than industrial inputs.[2]

On the side of agriculture, the index of agricultural production and share of agricultural sector to GDP have witnessed marginal increases since 1986.[3] But petroleum continued to dominate the total exports, with share of major agricultural export commodities standing only at 5.2% in 1987 and 5.7% in 1988.[4] The share declined further to 3.0% in 1989 while the share of petroleum was 92.9%,

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1. Ayodele, A.S. et.al (eds), Reflating a Depressed Nigerian Economy. Department of Economics, ABU, Zaria, 1988, p. 11.
2. Ibid.
3. Annual Report and Statement of Accounts, for the year ended 31st December, 1989, CBN, Lagos.
4. Ibid.

91.2% and 94.9% in 1987, 1988 and 1989 respectively. Although there has been an increase in the production of most of Nigeria's major agricultural export commodities during the period, with output in cocoa rising from 105,000 tonnes in 1987 to 230,000 tonnes in 1988[1], there has not been a significant increase in the export of these commodities. This development indicates the increasing use of these commodities by the agro-allied industries that flourished after 1986 as well as the smuggling of the agricultural commodities into the neighbouring countries. The increase in the output of cocoa and other agricultural export commodities could be due to reduction in employment and utilization of resources in the production of other crops. For instance, while the unit price per ton for the production of maize increased at the end of 1986, the selling price per ton had declined thereby forcing farmers to shift their resources to the production of other pfofitable crops.[2]

(b) Balance of Payments

According to the theory of purchasing power parity, the exchange rate links the price levels of different countries. In this case, the prices of internationally traded

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1. Ibid.

2. Usoro, E.J. Development of the Nigerian Agricultural Sector within the Framework of the SAP in Phillips, A.O. and Ndekwu, E.C. (eds) Op.cit, p. 170.

goods can be changed by varying the exchange rate. The exchange rate affects the balance of payments through effects on exports and imports of goods and services and capital inflows/out flows. A depreciation/devaluation of the naira, for instance, is expected to improve the balance of payments through one or combination of the following:

(i) raising, in terms of naira, the prices of imports of goods and services into the country relative to domestically produced goods and services. This is expected to reduce import demand;

(ii) reducing, in terms of foreign currency, the prices export commodities from Nigeria relative to the prices of commodities in the importing country and relative to the prices of exportables from the country's trading competitors. This is expected to increase export sales abroad.

(iii) encouraging foreign capital inflow and discouraging outflow.

In Nigeria the price and quantity of crude petroleum, which accounts for over 95% of total export earnings, are fixed by the OPEC as a result of which devaluation/depreciation will not have much impact on earnings from oil. Exchange rate change does not also affect the prices of primary export commodities which are determined on the various commodity exchanges abroad by the consumers.

Therefore, trends in the current account of the balance of payments are, to some extent, determined independently of exchange rate action. The figures in Table 3.1, 3.2 and 3.3, which show different aspects of balance of payments, are in million naira. The value of Nigeria's exports, as table 3.3 shows, was ₦9,088 million in 1984 and ₦11,720.8 million in 1985, but it declined in 1986 when SAP was introduced to ₦8,920.5m. The value of exports jumped to ₦30,239.9m in 1987, although the substantial increase was only in nominal (i.e. naira) terms. For instance, the indices of average prices in dollars of Nigeria's major agricultural exports (1975 = 100) was only 127.4 in 1987 and 127.8m in 1988 but due to the naira depreciation the indices in naira terms were 833.1 and 935.4 in 1987 and 1988 respectively.[1] The increase in exports was slight in 1988 even in naira terms. The value of exports showed a declining trend in terms of foreign currencies. For example, the value of non-oil exports declined from 537m S.D.R. in 1985 to 340 million S.D.R. in 1986, a decline of 36.69%.[2] In 1987 it declined further to 285 S.D.R., a decline of 47% from the 1985 level.

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1. CBN Annual Report and Statement of Account for the Year ended 31st December, 1989, p.21.
2. IMF Balance of Payments Statistics, Vol.39, No.II 1988.

On the import side, because of the structural malfaction of the Nigerian economy in which industrial sector depends heavily on foreign sources for its raw materials, intermediate and capital goods, exchange rate can hardly bring about the desired structural change.[1] This is so as studies have shown that the demand elasticities for Nigeria's imports are generally low as a result of which any attempt to curtail imports through price changes might not be as fruitful as being advocated.[2] For these reasons the value of imports in maira terms continued to increase since the introduction of the exchange rate adjustment in 1986 as table 3.3 shows.

The external reserves in naira terms increased by 29% in 1987 from the 1986 level but this increase was absorbed by the substantial rise in imports in 1987 as indicated by the ratio of reserves to imports which fell from 7.19 in 1986 to just 3.12 in 1987. Apart from that, the reserves in both 1986 and 1987 would have been lower if part of the external debt commitments falling due during that period had not been defered.[3] The situation is worse in 1988 even on the basis of exteenal

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1. Kwanashie, M. Structural Adjustment: Capital Accumulation and Employment in Phillips, A.O. and Ndekwu, E.C. (eds) Op.cit.

2. Obadan, M.I. A Critical Appraisal of the SFEM as Instrument of Policy in Attah, J, Kwanashie, M and Ojowu, O. (eds) Op.cit.

3. Ojo, M.O. An Appraisal of the Socioeconomic Impact of Structural Adjustment Policies in Nigeria in Bullion, CBN July/December, 1989 Vol.13, No.3, p. 67.

reserves and balance of payments position as tables 3.1 and 3.3 show. The ratio of reserve to import was only 1.19 in 1988 which implied that it could not finance two-months worth of imports at the current import level. That situation is very critical since it implied that two years after the programme that aimed at determining the realistic exchange value for the naira, the Nigeria's reserve holding was far less than the stipulated minimum four-month levels needed as reserves. In 1987 there was a balance of payments surplus and an increase in external assets. But this positive development was accounted for largely by an increase in oil export earnings which increased from US $5,469.5m in 1986 to US $7,575.6million in 1987 as shown by the table 3.5. The non-oil exports which the depreciation of the naira intended to increase declined by 16% during the same period.[1] In 1988, the balance of payments was in terrible deficit while it suddenly reverted to a dramatic surplus of ₦8,727.8m in 1989 (see table 3.1). Like in 1987, the surplus of 1989 was not due to better performance of non-oil exports but due to oil exports which increased substantially from ₦28,435.4 million in 1988 to ₦55,016.8 million in 1989, a 93% increase.[2]

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1. IMF Balance of Payments Statistics. Op.cit.

2. CBN Annual Report and Statement of Accounts for the Year ended 31st December, 1989.

(c) Government Budget.

The change in exchange rate that started in 1986 has resulted in massive depreciation of the naira. One effect of this is a substantial change in the character and magnitude of the government budget as a result of the tremendous boosting of the domestic revenue of the Federal, state and local governments. As a result of the depreciation of the exchange rate the naira equivalent value of foreign exchange earnings has increased substantially. For this reason the size of the federal budget and its components have grown phenomenally since 1985. The federal retained revenue, as s table 3.8 shows, increased from ₦9,640.3m in 1985 to ₦37,792.1m in 1990. Total Federal government expenditure increased from ₦12,680.3m in 1985 to ₦61,149.1m in 1990. However, the size of the overall budget deficit has also increased from ₦3,039.7m in 1985 to ₦23,357.0m in 1990. The substantial increase in revenue, in terms of naira earnings, has enabled the governments to finance their recurrent budgets and settle their naira denominated debt due to contractors and suppliers. The increase in expenditures which is the result of enahanced revenue accrued to the government has enabled the governments to complete the ongoing capital projects and undertake new ones.

(d) Income and Inflation

The depreciation of the naira which resulted from the attempt to determine the realistic exchange rate has caused a substantial rise in the naira prices of most of Nigeria's cash crops. Table 3.9 shows the prices of selected cash crops between 1985/86 and 1989. The 1985/86 prices are pre-S(FEM) prices while the 1986/87 and 1989 prices are the post-S(FEM) prices for those buying seasons. The increases in prices are very remarkable. For example, a tonne of cocoa which sold for ₦1,600.00 in 1985/86 sold for ₦7,500.00 in 1986/87, which is a post-S(FEM) period. The price was ₦10,100.00 in 1989. In general, all the commodities listed recorded substantial percentage increase in prices between 1985 and 1989 with benniseed recording the highest percentage increase of 1,322.2 while the lowest percentage increase of 118.3 was recorded by palm oil. Also there have been increases in the prices of other agricultural products used largely by the domestic industries. The increased prices of agricultural produce has resulted in improved rural nominal incomes which led to the increase in the share of the country's wealth flowing to the rural areas.

Since 1986, the depreciation of the naira has been a major factor responsible for rising the rates of inflation in Nigeria. As the country is highly dependent on imported inputs and raw materials to keep the manufacturing

industries going, every depreciation of the naira leads to the rising of naira prices of imported inputs and this is transmitted to the whole economy in the form of high prices of goods and services. As table 3.4 shows, the annual average of retail price indices (November 1975 = 100) rose from 867.6 in 1986 to 931.5 in 1987, with index for food component rising from 944.1 to 1,037.7. The indices for food and clothing components increased by 39% and 3% respectively between 1987 to 1988. The depreciation of the naira, therefore, has caused a reduction in real income and effective demand of the Nigerians.

Table 3.1

Major Accounts of Nigeria's Balance of Payments: 1960-1989
(₦ Million)

Year	Trade Balance Merchandise	Current Account Balance	Capital Account Balance	BP Deficit (-) or Surplus(+)
1960	-88.6	-138.6	54.2	-78.4
1961	-87.4	-123.4	64.0	-35.0
1962	-67.2	- 97.6	29.8	-55.8
1963	-29.2	-109.0	69.2	-90.0
1964	-68.6	-173.4	147.6	-33.4
1965	- 5.6	-127.4	132.0	19.2
1966	62.0	-118.4	96.8	-17.6
1967	40.8	4116.0	122.8	-67.4
1968	34.6	-168.2	160.0	6.0
1969	166.8	-108.6	80.6	17.2
1970	178.0	-50 .0	49.2	58.6
1971	285.0	-229.4	293.4	127.8
1972	477.5	-309.5	259.2	-40.8
1973	1,024.1	107.7	59.2	165.5
1974	4,439.3	3,062.5	- 5.9	3,102.2
1975	1,487.1	42.6	141.1	157.5
1976	1,293.5	-259.3	-506	-339.9
1977	537.0	-656.5	234.4	-447.0
1978	2,147.3	-2,386.9	111.9	-1,293.6
1979	3,364.3	1,009.5	813.2	1,868.9
1980	5,091.1	2,355.3	97.4	2,402.2
1981	-1,896.3	-3,998.4	833.1	-3,020.8
1982	-2,564.1	-4,879.5	1,026.8	-1,398.3
1983	-1,401.2	-3,160.0	2,735.2	-301.3
1984	1,909.7	94.6	66.8	354.8
1985	3,281.9	1,096.3	-202.3	561.1
1986	2,936.9	-2,999.1	-1,900.9	-784.3
1987	12,498.9	-295.3	-16,743.3	159.2
1988	9,747.1	-1,437.7	-18,447.3	-2,294.1
1989*	27,111.0	13,968.4	16,874.9	8,727.8

Note: *The 1989 figures are provisional

Sources:
1. Falegan, S.B. "Trends in Nigeria's Balance of Payments and Policy Measures needed for self-reliance" in Self-Reliance and Self-Sufficiency: papers presented and compiled at the National Workshop on Self Reliance and Sufficiency in the Nigerian Economy. Adekanmbi Memorial Press, Ibadan, 1979.
2. "CBN Annual Report and Statement of Accounts" Various Issues.

Table 3.2

The External Assets of Nigeria: 1970-1987 (₦m)

Year	Total External Assets of Nigeria
1970	176.7
1971	303.2
1972	270.6
1973	438.1
1974	3,540.1
1975	3,696.4
1976	3,487.5
1977	3,033.9
1978	1,387.2
1979	3,250.8
1980	5,655
1981	2,576.4
1982	1,065.3
1983	828.7
1984	1,422.1
1985	1,816.8
1986	5,022.6
1987	6,766.2

Source: "Nigeria Business Guide". 1st Edition. INCON Limited (Merchant Bankers).

Table 3.3

Selected Economic Indicators in Nigeria: 1978-1988(Nm)

Item	GDP at Current Factor Cost	Total Exports	Total Imports	External Reserves	Reserve/ Import
1978	34,540.1	6,064.4	8,211.7	1,192.5	1.74
1979	41,974.3	10,836.8	7,472.5	3,043.0	4.89
1980	49,632.3	14,077.0	9,658.1	5,445.2	6.77
1981	57,569.8	10,470.1	12,013.2	2,424.8	2.42
1982	58,830.1	8,722.5	12,565.5	1,026.6	0.98
1983	60,679.0	7,502.5	8,903.7	725.2	0.98
1984	68,662.1	9,088.0	7,178.3	1,080.0	1.81
1985	78,775.6	11,720.8	7,932.9	1,641.1	2.48
1986	81,292.8	8,920.5	5,983.6	3,587.4	7.19
1987	107,640.0	30,239.9	17,861.7	4,643.3	3.12
1988	136,958.7	33,138.1	24,900.4	3,272.7	1.58

Note: *Reserve/Import is the number of months that the external reserves could accommodate in financing the current import level. It is found by multiplying the value of the external reserves by 12 and then divide by the value of imports.

Source: Economic and Financial Review. CBN, Vol.27, No.2.

Table 3.4

Annual Average Retail Price in Nigeria: Base Nov. 1975=100

Components	1981	1982	1983	1984	1985	1986	1987	1988
1. Food	468.3	510.2	614.2	850.7	870.6	944.6	1,037.7	1,445.8
2. Beverage and Drinks	278.5	287.7	311.6	452.1	576.8	644.9	640.5	858.3
3. Tobacco	186.3	209.4	210.6	234.3	261.9	300.1	358.3	537.8
4. Fuel & Light	274.3	302.9	343.0	340.6	359.7	719.1	591.9	684.6
5. Clothing	335.5	364.1	467.9	629.4	777.3	1,046.7	1,457.1	1,505.8
6. All Items	401.5	426.4	505.4	696.9	762.3	867.6	931.5	1,250.4

Source: Bullion. Central Bank of Nigeria July/December, 1989, Vol.13, No. 3-4.

Table 3.5

Crude Oil Statistics in Nigeria: 1981-1988

Year	Oil Export Earnings US $ Million	Oil Revenue (₦ Million)	Ratio of Oil to total Export Earnings	Ratio of Oil to total Revenue
1981	17,659.6	8,546.4	98.2	70.3
1982	12,779.1	7,814.9	98.6	66.4
1983	9,953.3	7,253.0	96.0	69.0
1984	11,568.4	8,269.2	97.3	73.9
1985	12,203.7	10,923.7	97.1	74.4
1986	5,469.5	8,107.3	93.8	65.9
1987	7,575.6	19,027.0	92.9	75.8
1988	6,457.1	20,933.8	88.4	76.7

Source: Bullion. CBN July/December, 1989, Vol.13, No.3-4.

Table 3.6

Index of Industrial Production 1972=100

Year	Manufacturing	Mining	Electricity	Total for Sectors
1984	280.8	75.9	316.5	147.0
1985	336.5	81.6	363.3	169.4
1986	323.4	79.8	438.3	166.0
1987	432.2	72.1	431.5	195.8
1988[1]	505.3	78.9	456.9	224.2
1988[2]	516.4	94.1	514.0	239.1

Notes: 1. Revised 2. Provisional

Source: Annual Report, 1989. CBN of Nigeria.

Table 3.7

Index of manufacturing production. (Base Quarterly Average 1972=100)

	Sugar Confectionery	Soft Drinks	Bear and stout	Cotton Textiles	Synthetic Fabrics	Foot Wear	Paints	Refined petroleum	Cement	Profi-Products	Vehicle Assembly	Soap and Detergent	Radio and T.V	Total
1984	47.2	921.6	419.4	103.9	639.4	51.3	243.1	251.7	60.9	113.2	689.3	171.0	334.1	280.8
1985	42.2	785.4	489.3	110.0	340.2	41.8	177.2	358.8	303.8	205.1	134.1	178.3	367.6	336.6
1986	30.5	559.4	617.4	44.0	666.8	32.7	140.1	201.1	328.5	525.9	629.0	181.4	181.4	323.5
1987	57.7	1005.6	406.9	140.1	3,828.9	23.2	157.9	296.1	279.6	155.8	362.6	498.7	81.6	432.3
1988	38.1	1045.6	544.4	141.9	4,386.5	24.5	165.3	364.5	336.1	100.6	243.1	483.1	25.9	505.3
1989	35.5	1,091 .2	525.8	148.4	4,862.5	21.6	163.7	362.9	368.8	231.1	239.6	493.1	24.2	516.4

Source: Annual Report, 1989. Central Bank of Nigeria

Table 3.8

Federal Government Budgetary Operations

Year	Federal Retained Revenue(Nm)	Total Federal Expenditure(Nm)	Overall Budget Deficit (Nm)
1985	9,640.3	12,680.0	- 3,039.7
1986	7,969.4	16,223.7	- 8,254.3
1987	16,129.0	22,018.7	- 5,889.1
1988	15,588.6	27,749.5	-12,160.9
1989	25,762.2	41,028.3	-15,266.1
1990	37,792.1	61,149.1	-23,357.0

Source: Central Bank of Nigeria, Annual Reports and Statements of Accounts.

Table 3.9

Prices of Selected Cash Crops (N per Tonne)

Commodity	1985/86 (1)	1986/87 (2)	1989 (3)	Percentage Change between (1)&(2)	Percentage Change between (1) &(3)
Benniseed	360	2,295	5,120	537.5	1,322.2
Cocoa	1,600	7,500	10,100	358.8	531.3
Coffee(Arabica)	1,450	5,000	7,464	244.8	414.8
Copra	300	-	n.a	-	-
Cotton	850	3,500	2,433	311.8	186.2
Groundnut	750	2,500	4,775	233.3	536.7
Ginger (Peeled)	950	1,500	2,873	57 .9	202.4
Palm Kernel	480	850	1,800	112.5	350.0
Palm Oil	600	1,200	1,310	100.0	118.3
Soya Beans	500	1,500	4,030	200.0	706.0
Rubber	750	1,000	2,000	33.3	166.7
Kolanut	-	7,500	15,000	-	-
Chilli Pepper	-	3,500	9,017	-	-

Source: Central Bank of Nigeria, Annual Reports and Statements of Accounts.

CHAPTER FOUR

4 DATA ANALYSIS

4.1 Nigeria's Exchange Rate Movements

Instability of exchange rate discourages long term investments and distorts the development planning of a nation. For these reasons the best approach to exchange rate determination in a developing country like Nigeria is the one that ensures less instability. In this section we shall investigate the degree of exchange rate variability during the two broad periods of exchange rate regimes i.e. fixed/adjustable pegged rate regime and the regime of dirty-floating. The regime of fixed/adjustable pegged rate is an extended period and it covers a period of fifteen years (1971-1985) in our sample while the dirty-floating regime is a short period covering the period of 1986-1990. We shall calculate the coefficient of variation in each of the two periods to see which period has more fluctuation.[1] The smaller the coefficient of variation, the smaller the underlying fluctuations during the period.[2]

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1. Cline, W.R. (1976), International Monetary Reform and the Developing Countries. The Brookings Institution, Washington, D.C. p. 18.

2. Ibid.

The exchange rates data, which are naira-dollar exchange rates, are shown in Table 4.1 below

Table 4.1

Standard Deviation of the Naira-Dollar Exchange Rates:1971-85

Year	Exchange Rate (Naira Per One US Dollar) X	X^2
1971	0.7128	0.5081
1972	0.6579	0.4328
1973	0.6579	0.4328
1974	0.6288	0.3954
1975	0.6155	0.3788
1976	0.6266	0.3926
1977	0.6446	0.4155
1978	0.6351	0.4034
1979	0.6027	0.3632
1980	0.5465	0.2987
1981	0.6138	0.3768
1982	0.6732	0.4532
1983	0.7234	0.5233
1984	0.7642	0.5840
1985	0.8924	0.7964
	9.9954	6.755
	$\bar{x}$ = 0.66636	

Source: International Financial Statistics, 1987 Yearbook.

$$S = \sqrt{\frac{\sum x^2 - N\bar{x}^2}{N-1}} \quad \text{.... eq.17}$$

where,

S= Standard deviation

X = Exchange rate

$\bar{X}$ = The mean of exchange rate

N = Number of observation

The value of our standard deviation as computed from Table 4.1 above is 0.0821431. The coefficient of variation, V, is defined as:

$$V = \frac{S}{\bar{X}} = 0.0101259$$

For the shorter period, when dirty-floating (FEM) is being operated, the computation is on Table 4.2 below:

Table 4.2

Standard Deviation of the Naira-Dolla Exchange Rates: 1986-1990.

Year	Exchange Rate (Naira per One US Dollar) X	X^2
1986	1.3468	1.8139
1987	4.0064	16.0512
1988	4.4823	20.0910
1989	7.6221	58.0964
1990	8.7100	75.8641
	26.1676	171.9166
	$\bar{X}$ = 5.23352	

Note: Exchange rates from 1986 to 1988 are annual average while the exchange rates for 1989 and 1990 are as at end of the respective years.

Sources:

1. International Financial Statistics, 1987 Yearbook and Vol. XLII, No.5, May 1989.
2. Central Bank of Nigeria Annual Reports and Statement of Accounts, 1989 and 1990.

Our standard deviation for the shorter period (1986-1990) when FEM is used to determine the exchange value of the naira is found to be 2.9566852. The coefficient of variation is found to be 0.5649515.

Comparing the coefficients of variation for the two periods we find the coefficient for the shorter period (1986-1990) is greater than that of extended period of fixed/pegged rate regime. Hence, there is more fluctuation for the period of only five years because of frequent and large variations in exchange rate compared with the extended period of fifteen years. This implies more instability of exchange rate when the value of the naira is being determined by the forces of demand and supply.

4.2 Purchasing Power Parity (PPP) Applied to Nigeria

As we pointed out earlier, one of the short comings in applying the purchasing power parity is that structural forces, a part from the monetary factors, may influence the foreign exchange market. There are two implications in Nigeria as far as this shortcoming is concerned. First, since Nigeria depends largely on petroleum for her foreign exchange earnings, a decline in oil revenue resulting from either oil glut or fall in the international oil price will lead to the depreciation of the naira. During the oil boom, such as during the Arab-Israel war of early 1970s, the naira will appreciate. We can over come this problem in our calculation of the purchasing power parity rate by

The other side of structural changes to be considered in applying the purchasing power parity is the effects that the Structural Adjustment Programme have on the economy. Although SAP policies such as depreciation of the naira and removal of subsidies have helped to change the structure of the Nigerian economy, it is only those policies that directly contribute to the balance of payments equilibrium that are considered as important in application of PPP. Those policies that do not directly contribute to the balance of payments equilibrium are regarded as unimportant as far as the short comings in the application of the PPP is concerned.[1] Our concern, therefore, is whether any of the policies under the SAP have contributed greatly (positively or negatively) to the balance of payments situation in the country. If they do then their structural effects on the economy will reduce the validity of applying PPP theory to the Nigerian situation after the introduction of SAP in 1986. While some economists such as Bird, Khan and Lizondo supported the idea that currency depreciation affects the balance of payments position of the economy of developing countries, others such as Cooper Krugman, Taylor and many Nigerian economists have expressed some reservations regarding the efficacy of these policies.[2]

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1. Osagie, E and Obggu, B.E. Op.cit.
2. Ibid.

Available statistics indicate a decline in non-oil export earnings of Nigeria in foreign currencies since the introduction of SAP. For instance, the value of non-oil exports declined from 537 million S.D.R. in 1985 to 340m SDR in 1986 and declined further to 285 million in 1987.[1] The above arguments suggest that even though there have been structural changes in the Nigerian economy as a result of SAP, such changes are not to the extent that can render the use of PPP theory to the naira inappropriate. Officer has observed that even the critics of the PPP recognize its validity in certain aspects.[2] Since the introduction of SAP the CBN has been trying to determine an equilibrium exchange rate through the auctioning of the available foreign exchange to the authorised dealers. The exchange rate to be ultimately arrived at may not be an equilibrium rate since the supply of the foreign currencies being auctioned is limited. Therefore there is a need to provide another objective criteria that will guide the CBN in its exchange rate determination.

Dr. Omoruyi has recognised PPP as one of such options and observed that " Apart from proving guides to exchange rate management, the equilibrium exchange rate (PPP rate)

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1. Balance of Payments Statistics, IMF, Vol.39, No.II 1988.

2. Officer, L.H. op.cit.

also constitutes one of the critical variables in determination of the degrees of over-valuation or under-valuation of the currency".[1] Hence, in addition to the market exchange rate determination, the PPP rate will provide further guidelines to the CBN in its current efforts to determine the real exchange rate for the naira.

The Choice of Foreign Currencies and Base Year

We have chosen the United States dollar and the pound sterling as the currencies with which to compare the naira not only because the currencies are widely used in the international trade but also because the USA and the UK are among the major trading partners of Nigeria. For instance, about 30% of the Nigeria's total non-oil exports was accounted by the UK in the 1980s while the USA accounted for about 35% of total oil exports during the same period.[2] We have chosen 1983 in our PPP rates calculation because in that year the effects of structural change due to oil glut or oil boom was less and the balance of payments position was not in much disequilibrium compared to previous years. In determination of exchange rate using PPP, condition of equilibrium in the balance of trade serves as definition of exchange rate that represents purchasing power parity as Cassel explains:

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1. Omoruyi, S.E. (1989), Structural Adjustment and National Development: Deriving and ensuring a fair and viable exchange rate for the naira in Economic and Financial Review, CBN, Vol.27, No.3.

2. Osagie, E and Okogu, B.E. Op.cit.

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"Equilibrium in the international balance of trade can evidently only be reached at a rate of exchange which will enable A to sell as much as to B as B to A. This condition may serve as the exact definition of the rate of exchange that represents the purchasing power parity. Obviously, at this rate of exchange the purchasing power of the one currency is as nearly equal to that of the corresponding amount of the other currency as it is possible to ascertain".[1] The balance of payments position was in nearest to equilibrium in 1968 when there was a surplus of only ₦6.0 million. So, we chose 1968 in our PPP rates calculation vis-vis pound sterling.

Purchasing Power Parity Rates for the Naira.

Consumer price indices and exchange rates, published in the IMF International Financial Statistics 1987 Year Book and May 1989 edition, were used for both USA and Nigeria. The consumer price indices of Nigeria for 1987 and 1988 were obtained from the Bullion by the Central Bank of Nigeria, July/December, 1989, Vol.13, No.3-4.

The dollar-naira exchange rates, which were period average of exchange rates in Nigeria, were converted into naira-dollar exchange rates as is the current practice of exchange rate quotation by the CBN. By this convention we are defining exchange rate as the number of naira required

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1. Chachodiades, M. (1978), International Monetary Theory and Policy. Mcgraw-Hill Book Company, p. 186.

to purchase one unit of foreign currency and therefore PPP rate equals our equation 4 of chapter two. By this definition our formular for calculating an over-valuation/under-valuation of naira is:

$$\frac{\text{PPP rate} - \text{Actual exchange rate}}{\text{Actual Exchanre Rate}} \times 100 \quad ..\text{eq.18}$$

A plus sign indicates an over-valuation while a minus sign indicates an under-valuation. The naira-pound exchange rates are cross rates obtained from the same source.

The data and the estimated PPP rates as well as over-valuation/under-valuation are shown in the Table 4.3 and 4.4 below:

Table 4.3

Calculated PPP Rates for the Naira vis-avis the US Dollar

(1960-1988)

Year	Nigeria CPI. 1980 = 100	U.S.A. CPI. 1980 = 100	Actual Exchange Rate ₦ per US Dollar	PPP Rate	% Over/ under-valuation
1960	15.81	35.92	0.7143	0.3184	-55.42
1961	16.82	36.30	0.7143	0.3352	-53.07
1962	17.71	36.71	0.7143	0.3490	-51.14
1963	17.23	37.16	0.7143	0.3354	-53.04
1964	17.38	37.64	0.7143	0.3340	-53.24
1965	18.09	38.25	0.7143	0.3421	-52.11
1966	19.84	39.42	0.7143	0.3641	-49.03
1967	19.10	40.52	0.7143	0.3410	-52.26
1968	19.00	42.22	0.7143	0.3255	-54.43
1969	20.95	44.49	0.7143	0.3406	-52.32
1970	23.81	47.12	0.7143	0.3655	-48.83
1971	27.65	49.15	0.7128	0.4070	-42.90
1972	28.40	50.77	0.6579	0.4047	-38.49
1973	30.01	53.93	0.6579	0.4025	-38.82
1974	33.77	59.85	0.6288	0.4082	-35.08
1975	45.12	65.32	0.6155	0.4997	-18.81
1976	55.07	69.08	0.6266	0.5767	- 7.96
1977	66.88	73.58	0.6446	0.6575	2.00
1978	81.40	79.17	0.6351	0.7438	17.12
1979	90.93	88.13	0.6027	0.7464	23.84
1980	100.00	100.00	0.5465	0.7234	32.37
1981	120.81	110.35	0.6138	0.7920	29.03
1982	130.11	117.15	0.6732	0.8034	19.34
1983	160.31	120.91	0.7234	0.9591	32.58
1984	223.77	126.07	0.7642	1.2840	68.02
1985	236.13	130.55	0.8924	1.3084	46.62
1986	238.65	133.06	1.3468	1.2975	-3.66
1987	248.85	138.0	4.0064	1.3045	-67.44
1988	287.15	143.47	4.4823	1.4479	-67.70

Note: A plus sign indicates an over-valuation while a minus sign indicates an under-valuation.

Source: 1. International Financial Statistics, 1987 Yearbook IMF 1987.

2. International Financial Statistics, Vol.XLII, No. 5, May, 1989.

3. Bullion, Central Bank of Nigeria, July/December 1989. Vol.13, No.3-4.

Table 4.4

Calculated PPP Rates for the Naira Vis-a-Vis the Pound Sterling

Year	CPI Nigeria 1980=100	CPI. UK 1980=100	Exchange Rate Naira per one pound	Exchange Rate pounds per one dollar	Cross Rate Naira per one pound	PPP Rate	% Over-valuation/ under-valuation.
1960	15.81	18.63	0.7143	0.3571	2.0003	1.4547	-27.28
1961	16.82	19.28	0.7143	0.3571	2.0004	1.4955	-25.24
1962	17.71	20.08	0.7143	0.3571	2.0003	1.5119	-24.42
1963	17.23	20.49	0.7143	0.3571	2.0003	1.4415	-27.94
1964	17.38	21.16	0.7143	0.3571	2.0003	1.4080	-29.61
1965	18.09	22.17	0.7143	0.3571	2.0003	1.3987	-30.08
1966	19.84	23.04	0.7143	0.3571	2.0003	1.4761	-26.21
1967	19.10	23.60	0.7143	0.3614	1.9765	1.3873	-29.81
1968	19.00	24.71	0.7143	0.4167	1.7142	1.3181	-23.11
1969	20.95	26.06	0.7143	0.4167	1.7142	1.3781	-19.61
1970	23.81	27.72	0.7143	0.4167	1.7142	1.4724	-14.11
1971	27.65	30.34	0.7128	0.4108	1.7352	1.5622	- 9.97
1972	28.40	32.49	0.6579	0.3997	1.6460	1.4984	- 8.97
1973	30.01	35.48	0.6579	0.4078	1.6133	1.4499	-10.13
1974	33.77	41.13	0.6288	0.4275	1.4709	1.4075	- 4.31
1975	45.12	51.13	0.6155	0.4501	1.3675	1.5127	10.62
1976	55.07	59.59	0.6266	0.5536	1.1319	1.5842	39.96
1977	66.88	69.03	0.6446	0.5729	1.1252	1.6608	47.60
1978	81.41	74.74	0.6351	0.5210	1.2190	1.8672	53.17
1979	90.93	84.77	0.6027	0.4713	1.2788	1.8388	43.79
1980	100.00	100.00	0.5465	0.4299	1.2712	1.7142	34.85
1981	120.81	111.88	0.6138	0.4931	1.2448	1.8510	48.70
1982	130.11	121.50	0.6732	0.5713	1.1784	1.8357	55.78

Table 4.4 Continued

1983	160.31	127.10	0.7234	0.6592	1.0974	2.1621	97.02
1984	223.77	133.40	0.7642	0.7483	1.0212	2.8755	181.58
1985	236.13	141.51	0.8924	0.7714	1.1569	2.8604	147.25
1986	238.65	146.41	1.3468	0.6817	1.9756	2.7942	41.44
1987	248.85	152.41	4.0064	0.6102	6.5657	2.7989	-57.37
1988	287.15	160.00	4.4823	0.5614	7.9841	3.0765	-61.47

Note: The Naira pound exchange rate, which is shown in column 6, is a cross rate which is found by dividing column 4 by column 5.

Sources:

1. International Financial Statistics, 1987 Year Book. IMF, 1987.
2. International Financial Statistics, Vol.XLII, No.5, May, 1989.
3. Bullion, Central Bank of Nigeria, July/December, 1989. Vol.13,No.3-4.

As it can be seen from Table 4.3, using 1983 as a base year, Nigerian currency had been under-valued from 1960 when the country got independence up to 1976. This empirical finding contradicts the assumption among some scholars that the naira was over-valued since its introduction in January, 1973. The reason for such an under-valuation to last a span of seventeen years out of the twenty-eight years under review was the rate of inflation that was higher in USA than in Nigeria during the period and the fact that Nigeria had a fixed exchange rate against the dollar up to 1971, except slight revaluations in subsequent years and depreciation in 1976. By 1976 the oil revenue extravaganza seemed to be virtually over and by 1977 the trade balance declined from ₦1,293.5 million in 1976 to ₦537.0m. Then the wide gap in the relative prices between Nigeria and her trading partners seemed to be closing rapidly as inflation started to be an intractable problem in the country. If the level of reserves of Nigeria is low the naira is supposed to be devalued /depreciated in order to stimulate exports and check the growth of exports. A balance of payments deficits (in the sense of market balance) on the other hand suggests excess demand for foreign exchange and the need to devalue/depreciate the national currency in order to encourage exports and discourage imports. Hence, by 1977, despite an increase in oil revenue to the government, the decline in external assets persisted and so

the naira depreciated although the extent of the depreciation was not enough to off-set the change in domestic cost and prices vis-a-vis Nigeria's trading partners. Therefore, from then onwards the naira started to be over-valued against the US dollar on the basis of PPP criteria as the calculation in Table 4.3 shows. The over-valuation continued up to the new decade due to high rate of inflation in Nigeria than in USA without any substantial exchange rate changes.

The depreciation of the naira is supposed to reduce the degree of over-valuation. However, despite the depreciation of 5.6% in 1984, the naira was still over-valued by as much as 68%. This indicated that greater depreciation was needed in order to remove the over-valuation. Hence, the naira depreciated by about 17% in 1985 and the degree of over-valuation was reduced to about 47%. In the last quarter of 1986, the policy of market exchange rate determination was officially launched and so the naira exchange rate as annual average, depreciated by 51 percent against the US dollar. By the end of 1986 the naira was no longer over-valued but under-valued by 3.6% vis-a-vis the US dollar (according to the PPP criteria and using 1983 as a base year). From 1988 to 1989 the naira continued depreciating massively and so also it continued to be under-valued and its purchasing power drastically eroded.

The fact that prior to SFEM the CBN had to ration the available foreign exchange through import licencing and other methods of administrative control to manufacturers, merchandise importers and other Nigerians in need of foreign currencies was a testimony to the over-valuation of the naira at that time. The following are some of the indicators of the naira over-valuation prior to SFEM:

(a) Divergence between the PPP exchange rate and prevailing exchange rate. Prior to SFEM the basket of goods that Nigeria's naira could buy in Nigerian market was less than the same amount converted into foreign currencies could buy in foreign markets. In other words, foreign currencies converted into naira could buy more quantity of a good in Nigeria than in foreign markets.

(b) Excess of demand for over supply of foreign currencies. With the monetization of the oil revenues, aggregate demand is bound to increase leading to the quantity demanded for foreign currencies to exceed the supply. In such a case where demand exceeds supply, the naira was supposed to depreciate but that was not the case due to the CBN intervention which indicates the over-valuation of the naira.

As we can see from our calculations the massive depreciation of the naira in 1987 and after had led to the under-valuation of the currency. This evidence suggests that instead of the market-determination of exchange rate which the country adopted, the policy of gradual depreciation of the naira should have continued in line with the behaviour

of rates of inflation in Nigeria and other countries.[1] If that was done the over-valuation would have been removed without the terrible consequence which massive depreciation produced. Since the supply of foreign exchange is limited any attempt to determine exchange rate through the market forces would continue to lead to further depreciation because of the dependence of the economy on imports. The differences in prices between Nigeria and other countries will then widen and this will cause further under-valuation.

Implication of an Under-valued Naira for the Nigerian Economy.

One of the major objectives of the current policy of exchange rate determination in Nigeria through the forces of demand and supply is to arrive at an exchange rate which will significantly raise the non-oil exports and reduce imports. However, up to 1988 there had not been a significant change in the ratio of oil total revenue as Table 3.5 shows. Trade barriers against the exports from developing countries by the industrialised countries have also been emerging since the mid-1970s.[2] The implication of that is that the under-valued naira will produce the negative effects associated with the currency depreciation without yielding the positive effects it is supposed to produce.

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1. Osagie, E and Okogu, B.E. Op.cit.
2. Ibid.

The value of imports has also been increasing as Table 3.3 shows and this confirms the finding of low demand elasticities for Nigeria's imports.[1] While the under-valued naira has led to a significant increase in the cost of production and increase in general price level, the import demand is still high.

Another negative effect of the under-valuation of the naira as a result of market exchange rate determination is the crippling of some manufacturing industries and some priority sectors of the economy that cannot compete effectively with high profit and quick-return industries in the purchase of foreign exchange. The high cost of foreign exchange has denied many industries the opprtunity to acquire the foreign exchange they needed and this led to low capacity utilisation in such industries.[2]

From the foregoing analysis it is clear that the market exchange rate determination which is currently being practised in Nigeria has failed to achieve its objectives and therefore government intervention is needed in the overall interest of the economy. The exchange rate being determined through the FEM is arbitrary since the supply of the foreign exchange is at the discretion of the government and also it does not take into account price

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1. Obadan, M.I. A Critical Appraisal of the SFEM as Instrument of Policy in Attah, J, Kwanashie, M and Ojowu, O (eds). The Nigerian Economy under (S)FEM Department of Economics, A.B.U, Zaria.

2. Osagie, E and Okogu, B.E. Op.cit.

differentials between Nigeria and her trading partners. Therefore there is a need for a more objective criterion, such as the PPP approach, which will help in the determination of the naira exchange rate. The PPP theory has its own limitation as a result of which the CBN should use it as a guide in determining the margins within which the exchange rate should fluctuate rather than using the PPP rates we calculated in Tables 4.3 and 4.4 as the actual exchange rates.

Under the new method the CBN should use both PPP rate and market-determined rate, with appropriate weights assigned to each, in arriving at the effective exchange rate. That means after calculating the PPP rate, the CBN will continue to organise tender sessions so as to find the FEM rate, which depends upon the demand of the authorised dealers for the foreign exchange and the amount supplied by the CBN. In the determination of a weighted average of the FEM rate and the PPP rate, the CBN should assign weights to each of the rates taking into account other policy objectives since it is not only inflation differentials or demand for and supply of foreign exchange that should be considered in exchange rate determination. If the major objectives are the protection of local industries and promotion of non-oil

exports then more weights should be given to the FEM rate while if the objective is fight against inflation the ppp rate should have more weights. In order to ensure the smooth and effective operation of the new system the following measures should also be introduced:

(a) Allocation of the foreign exchange according to priority. The effective exchange rate we have proposed may not clear the market, so the CBN should after determining the rate then sell to the authorised dealers the available foreign exchange according to sectoral priority. Any prospective buyer of foreign exchange should furnish the authorised dealer in advance the documentary evidence of the underlying service, commercial or industrial transaction. The files for each transaction with the relevant documents will then be presented for verification by the CBN inspectors. This will ensure ascertaining the genuine demand for foreign exchange and adherence to sectoral priority.

(b) Publishing the names of beneficiary of the foreign exchange. In order to prevent speculators within the banking system the names of organisations or individuals to whom the foreign exchange is sold and uses for which it is sold should be published by the authorised dealers.

(c) Abolishing the interbank market. The operation of interbank dealings encourages speculation and unhealthy competition. The CBN should sell foreign exchange periodically to the authorised dealers while in the intervals the authorised dealers can purchase foreign exchange from the individuals to augment their stock.

4.3 $\underline{X^2 \text{ Tests}}$

The main aims of determination of exchange rate through the market forces in Nigeria are to increase the value of exports, reduce imports and improve the balance of payments position. In this section we shall use the X^2 distribution to find if changes in these macro-economic variables prior to 1986 are such that had justified abandoning the system of pegging the exchange rate in favour of the market-determined exchange rate and also to investigate the responses of these variables to the new policy.

With the data in Table.4.5 we shall perform tests of statistical significance in the values of exports and imports, using the X^2 distribution defined as:

$$X^2 = \sum_{i=1}^{n} \frac{(O-E)^2}{E} \quad \text{.... eq. 18}$$

where,

O = Observed frequencies

E = Expected frequencies

N = Number of observations

Table 4.5

Exports and Imports of Nigeria: 1981-1990 (₦ Million)

Year	Exports	Imports
1981	10,470.1	12,013.2
1982	8,722.5	12,565.5
1983	7,502.5	8,903.7
1984	9,088.0	7,178.3
1985	11,720.8	7,932.9
Total:1981-1985	47,503.9	48,593.6
1986	8,920.5	5,988.6
1987	30,239.9	17,861.7
1988	33,138.1	24,900.4
1989	57,971.2	27,200.9
1990	109,886.1	39,771.2
Total:1986-1990	240,155.8	115,717.8

Source: CBN Annual Report and Statement of Accounts, Various Issues.

To test the null hypothesis i.e there is no significant change in exports from 1981 to 1985 when the adjustable-pegged exchange rate was used, we compute our observed exports data as follows:

Table 4.6

Test of Significance of Difference in Exports: 1981-1985

Percentage Points of Exports =	Expected percentage points		$\frac{(O-E)^2}{E}$
= O	= E	O - E	
22	20	2	0.2
18	20	-2	0.2
16	20	-4	0.8
19	20	-1	0.05
25	20	5	1.25
100	100	x^2	2.5

From the computation our obtained $x^2 = 2.5$. From the table the critical value of x^2 at 5% confidence level with (5-1) degrees of freedom = 9.488. Since our obtained x^2 is less than 9.488, we accept the null hypothesis that there is no significant change (increase or decrease) in exports over the period. Hence, determination of exchange rate through the market forces in order to increase exports is justified. To investigate the response of exports as a result of the new policy, we take the post-SAP period, from 1986 to 1990. The computation is shown in Table 4.7.

Table 4.8

Test of Significance of Difference in Imports: 1981-1985

percentage points of import values = O	Expected Percentage points = E	O - E	$\frac{(O - E)^2}{E}$
25	20	5	1.25
26	20	6	1.8
18	20	-2	0.2
15	20	-5	1.25
16	20	-4	0.8
100	100	X^2	5.3

From the computation our obtained X^2 = 5.3 which is less than 9.488 i.e. value of X^2 at 5% confidence level with (5-1) degrees of freedom. Therefore, there is no singificant change in imports from 1981 to 1985 and this justifies using market-determined exchange rate as from 1986 so as to reduce imports significantly. To investigate how imports respond to the new approach of exchange rate determination, we take the post-SAP period i.e. 1986 to 1990, as worked out in Table 4.9.

Table 4.9

Test of significance of difference in Imports: 1986-1990

Percentage points of import values = O	Expected percentage points = E	O - E	$\frac{(O - E)^2}{E}$
5	20	-15	11.25
15	20	- 5	1.25
22	20	2	0.2
24	20	4	0.8
34	20	14	9.8
100	100	X^2	23.3

In the case of post-SAP period, the computed X^2 is greater than the critical X^2 0.05 with (5-1) degrees of freedom. Thus, the null hypothesis is rejected and we conclude that during the period there is a significant change in imports. However, as it is shown on Table 4.3 the values of imports during the period (1986-1990) shows an upward trend. Therefore the significant change in imports was an increase not a decrease as the policy intended.

Rate of Inflation.

Prior to the SAP, the rate of inflation in Nigeria was higher and rising more rapidly than in Nigeria's trading partners while exchange rate changes were slight. That situation encouraged importation and discouraged exports. Here we investigate if the changes in the rates of

inflation (measured by CPI) is significant before and after the introduction of the foreign exchange market. Table 4.10 shows the changes in CPI prior and after SAP:

Table 4.10

Changes in CPI in Nigeria: 1981 - 1990

Year	Percentage Change
1981	20.9
1982	7.7
1983	23.2
1984	39.6
1985	5.5
Total change: 1981-1985	96.9
1986	5.4
1987	10.2
1988	38.3
1989	50.5
1990	7.5
Total change: 1986-1990	111.9

Source: CBN Annual Report and Statement of Accounts, Various Issues.

From Table 4.10 we can test the hypothesis that there is no significant change in the rate of inflation in Nigeria from 1981 to 1985 using a X^2 distribution as shown in Table 4.11 below:

Table 4.11

Test of Significance of Difference in Consumer Price Index in Nigeria: 1981-1985

Percentage points of changes in CPI = C	Expected percentage points = E	O - E	$\frac{(O - E)^2}{E}$
21	20	1	0.05
8	20	-12	7.2
24	20	4	0.8
41	20	21	22.05
6	20	-14	9.8
100	100	X^2	39.9

From the computation the observed X^2 = 39.9 while the X^2 from the Table at 5% confidence level with (5-1) degrees of freedom is 9.488. Since the observed X^2 is greater than the tabulated X^2, we reject the null hypothesis. Therefore we can say there is significant change (increase) in CPI during the period which had justified the introduction of the market-determined exchange rate. Due to an increase in exports, decrease in imports and economic growth as a result of de-regulation of foreign exchange market, it is expected that the rate of inflation will come down during the SAP period. So, we perform a statistical test of significance for the post-SAP period to see if there is a significant change (decrease) in CPI from 1986-1990 using the data of table 4.10.

Table 4.12

Test of Significance of Difference in CPI in Nigeria:1986-1990

Percentage points of changes in CPI = O	Expected percentage points = E	O - E	$\frac{(O - E)^2}{E}$
5	20	-15	11.25
9	20	-11	6.06
34	20	14	9.8
45	20	25	31.25
7	20	-13	8.45
100	100	X^2	66.8

Here also the critical X^2 0.05 at (5-1) degrees of freedom = 9.488 while the observed X^2 is 66.8 and we therefore reject the null hypothesis. The conclusion is that there is a significant change in CPI during the period. However, the change in CPI is an increase, not a decrease as it is desired. The increasing inflationary pressures when the naira exchange rate is being adjusted downward is an indication of the failure of government to protect the low-income groups as President Ibrahim Babangida promised:

"The productivity, Price and Incomes Boards and the price intelligence agency must therefore be strengthen to selectively protect the prices of wage goods that directly affect the wellfare of workers and of other lower-income groups. If however, domestic food and

and agriculture continue to expand and if import dependence by industries is significantly reduced, then consequential inflationary impact of the structural adjustment programme can be moderated for the socially sensitive income classes".[1]

Although there has been a significant increase in exports from 1986 to 1990 when the exchange rate is being determined through the foreign exchange market as our test of significance shows in Table 4.7, there is doubt about this increase in real terms. Some people argue that the substantial rise in the value of exports is only in naira terms while in foreign currencies there is no significant change. We therefore perform the test of significance of the change in exports valued in US dollar to verify that claim. The value of the merchandise exports in the table below is in a foreign currency.

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1. Babangida, I.B. (1986), Address to the Nation on various National Issues, June 1986.

Table 4.13

Merchandise Exports: 1981-1990 (Millions of US Dollar)

Year	Exports
1981	17,961
1982	12,088
1983	10,309
1984	11,827
1985	13,369
Total: 1981-1985	65,554
1986	6,599
1987	7,654
1988	6,931.7
1989	7,870.9
1990	11,029.0
	40,084.6

Sources:

1. International Financial Statistics, 1987 Year book and Vol. XLII No.5, May, 1989.
2. Central Bank of Nigeria, Annual Reports and Statements of Accounts, 1989 and 1990.

To test the null hypothesis that there is no significant change in value of exports valued in US dollar from 1981 to 1985, we compute the observed exports data as follows:

Table 4.14

Test of Significance of Difference in Exports in US Dollar 1991-1985.

Percentage points of exports value = O	Expected percentage points = E	O - E	$\frac{(O - E)^2}{E}$
27	20	7	2.45
19	20	-1	0.05
16	20	-4	0.80
18	20	-2	0.20
20	20	0	0.00
100	100	X^2	3.5

The computed X^2 = 3.5 while the critical X^2 at 5% confidence level with (5-1) degrees of freedom = 9.488. Since the computed X^2 is less than 9.488, we accept the null hypothesis that there is no significant change in exports valued in US dollars over the period.

To verity if there is significant increase in value of exports in foreign currencies from 1986 to 1990, we take the post-SAP period as shown in the Table 4.15 below:

Table 4.15

Test of Sinciicance of Difference in exports in US Dollars 1986-1990.

Percentage points of exports value = O	Expected percentage points = E	O - E	$\frac{(O - E)^2}{E}$
16	20	-4	0.80
19	20	-1	0.05
17	20	-3	0.45
20	20	0	0.00
28	20	8	3.20
100	100	X^2	4.5

The computed X^2 is 4.5 which is less than X^2 at 5% confidence level with (5-1) degrees of freedom. We therefore accept the null hypothesis that there is no significance increase in exports valued in US dollars over the period.

Our findings from the computations are as follows: there were no significant increases in exports both in local and foreign currencies between 1981 and 1985 while the value of imports and rate of inflation did not decrease significantly over the period. Based on these findings the introduction of the foreign exchange market in 1986 is justified because the market exchange rate to be determined through the foreign exchange market was expected to help in raising the competitiveness of the Nigeria's exports and increase its value and it was expected also that imports would be made expensive thereby reduce its value. But the findings show that between 1986 and 1990, when the market exchange rate was used, there was an increase in the value of exports only in local currency, which was due to the depreciation of the naira, while the value of imports and rate of inflation had risen significantly.

Determination of exchange rate in Nigeria through the foreign exchange market has helped to fuel inflation in the country without achieving the major objectives of

of the policy. The modification of the policy, especially in favour of a system that moderates the rate of inflation is preferable. Such modification should be in line with our suggestion in section 4.2 of this chapter in which the weighted average of the FEM rate and the PPP rate is to be used so that changes in the relative prices can be appropriately off-set.

CHAPTER FIVE

5 SUMMARY AND RECOMMENDATIONS

This chapter summarises our findings and prescribes appropriate policy recommendations.

5.1 Summary

1. Flexible exchange rate, on theoretical grounds, enables the exchange rate to find its equilibrium level so that there will be no excess demand for the foreign currencies. Nigeria's decision to introduce the policy of market determination of exchange rate is informed by this theoretical postulation. However, evidence in Nigeria has shown that the elasticities of demand for imports and exports and elasticities of supply of imports and exports are low as a result of which the policy failed to achieve most of its major objectives: there is no significant increase in exports denominated in foreign currencies while the value of imports has increased significantly during the period.

2. Developments in the dollar and pound sterling exchange rates as well as revenues earned from oil dictated the Nigeria's exchange rate policy in 1970s while no attempt was made to use the exchange rate as an instrument of diversifying the economy and switching away expenditure from foreign to domestic consumption.

3. Contrary to the popular belief in Nigeria, the naira was under-valued vis-a-vis the U.S. dollar from 1960 up to 1976; this undervaluation, which lasted a span of seventeen years, was a reflection of price stability and lower inflation rates in Nigeria vis-a-vis those of U.S.A. during that period. In relation with the pound sterling, on the other hand, the naira was under-valued from 1960 to 1974.

4. From 1975 and 1977, the naira started to be over-valued vis-a-vis pound sterling and U.S. dollar respectively, according to the PPP criterion. From 1986 when the SFEM was introduced the naira started to be under-valued again against the U.S. dollar while the under-valuation against the pound sterling commenced from 1987.

5. The under-valuation of the naira as from 1986 has discouraged investment in the industries that produce goods with high import content while those industries whose products have high local value-added recorded a marginal increase in output. The under-valuation has also led to a significant rise in the rates of inflation which is contrary to the government policy objectives of raising the level of national income, boosting domestic output and moderation of the rate of inflation during the period of SAP.

6. The increase in the naira revenue as a result of the depreciation of the naira has enabled both the federal and state governments to complete many projects and under-take new ones as well as to settle their domestic debts. However,

on the external front the external reserves and balance of payments positions do not show any persistent positive development.

7. Although the depreciation of the naira since 1986 has caused an increase in the production of some agricultural commodities, the dominance of petroleum in Nigeria's foreign trade has remained, and the importation of food, beverages and tobacco continued with their upward trends despite the increase in the naira cost of imports.

8. Because of the rising rate of inflation in Nigeria and the failure of market exchange rate to achieve its major objectives, the PPP rates should be used as a guide in the determination of effective exchange rate in Nigeria. The effective exchange rate under the new method will consist of the weighted average of the FEM rate, which is influenced by the market conditions, and the PPP rate, which is influenced by relative prices. The weights to be assigned to each of the two rates should be variable, depending upon the existing economic condition and policy objective of the country.

5.2 Recommendations

Based on our findings, we make the following recommendations:

1. Market determination of exchange rate in Nigeria has failed to increase the productive base of the economy and reduce the dependence of the industrial sector on foreign inputs. For this reason, our scientists, engineers, technologists and research institutions should be given support and encouragement for the research and development of the available local raw materials for industrial use. An agricultural research should also be intensified so as to increase the national food supplies using local inputs and implements as much as possible.

2. The demand for imports is still very high in Nigeria. Government should ban the importation of those goods that we can produce locally and a legislation to that effect be made and enforced.

3. The official funding of the FEM should be increased in order to minimize the gyrations of exchange rate and ensure a move towards exchange stabilization.

4. The present under-valuation of the naira should be reduced by allowing the naira to appreciate. This can be achieved by ensuring that all the foreign exchange earnings from non-oil exports are repatriated and the official foreign exchange sold only to the genuine importers.

5. The depreciation of the naira has caused an unprecedented inflation in Nigeria due to the rise in the cost

of production. Products and services, such as fertilizers and petroleum, which are used as inputs by other sectors of the economy, should get more subsidies so as to reduce the high costs of production that various sectors of the economy suffer from as a result of high costs of their inputs.

5.3 Conclusion

The major concerns of this study are the analysis of exchange rate policies and determination in Nigeria. From the time of independence and up to 1986, the approach to exchange rate in Nigeria was haphazard and un-coordinated. Exchange rate policies were then made on basis to address specific problems and the determination of exchange rate was solely done by the monetary authority. With the introduction of the structural adjustment in 1986, exchange rate has become a major policy instrument that is designed to achieve specific goals. The policies and determination of exchanger rate as they are currently taking place are influenced by market conditions.

Three conclusions emerge from this study. First, the current method of determination of exchange rate has some operational problems such as abuses in the utilisation of foreign exchange sold to the authorised dealers. To remedy the problems the Central Bank of Nigeria should exercise greater control and supervision over the authorised dealers and strict penalty be imposed against the banks that fail to comply with sectoral guidelines in utilisation of foreign exchange. The second conclusion is that market exchange rate alone cannot ensure the achievement of non-inflationary growth and self-reliance in the country. Therefore the current policy of determination of exchange rate

through the foreign exchange market should be modified and supplemented by other approaches that will especially moderate the rising rate of inflation: this approach is purchasing power parity. Finally, exchange rate alone is not adequate in improving foreign sector performance in the country. The increase in value of imports and poor performance of exports valued in foreign currencies are testimonies to that. In order to ensure the diversification of the economy and reduce the imports of non-essential commodities, government must intervene as and when necessary.

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