

## **1.0 INTRODUCTION**

### **1.1 GENERAL BACKGROUND**

In any nation, there are basically four objectives of goals or macro economic policy: high level of employment, a reasonably stable price level, rapid economic growth, and maintenance of equilibrium in the international balance of payments. The last objective (balance of payments stability) is very crucial since the basic condition of the world community is one of mutual interdependence. Again, there is not a country in the world that does not rely to some degree, for its national well being on international trade and payments. This truth carries particular force for most developing countries, whose trade and payment magnitudes are particularly large in relation to domestic economic activity (killick 1981: 187). Most of these countries run large deficits and their international indebtedness continues to grow. The management of balance of payments is thus of great importance to the economic progress of such countries and Nigeria in particular.

For several years, Nigeria has been pursuing a strategy aimed at re-establishing international credit-worthiness and to achieve this goal, she has been seeking to narrow her balance of payments deficits on current account. But having such international payments equilibrium or deficits reduction is not an easy task. However there has been ways of achieving it, as offered by the traditional theories or approaches of balance of payments adjustment mechanism. More recently, a new theory (monetary approach) has developed and it emphasizes the application of monetary analysis to the international balance of payments problem. This new theory needs empirical investigation, and that is the major concern of this study.

### **1.2 STATEMENT OF PROBLEM**

Conventionally, the theory of balance-of-payments adjustment mechanism is viewed as a succession of approaches: the Hume's price specie flow mechanism, the elasticity's approach, the Keynesian Multiplier or income approach, the absorption approach and the policy approach that stresses internal and external balance. However a new approach, which centers on the idea that the balance of payments is essentially a Monetary Phenomenon has developed in recent years. It is the monetary approach to the theory of balance-of-payments adjustment mechanism. The essence of the approach or theory is a consistent insistence that the balance of payments is a 'monetary and not a real phenomenon' as postulated by the conventional theories. While the traditional theories maintain that balance

of payment disequilibria are permanent, the major point of departure of the new approach is the recognition of the fact that a country in balance of payment deficit (surplus) would *ceteris paribus*, experience a change in its money stock. The simplicity of the approach gives it the research efficiency award and therefore deserves a reasonably thorough exposition and verification, in order to ascertain its validity or reliability.

It is in view of this, that we want to investigate the relationship between the Nigerian balance of payments and domestic credit expansion; and to ascertain the importance of domestic credit expansion relative to real variables such as Government expenditure and Gross Domestic product in determining balance on current accounts outcome. The investigation is an attempt to examine the extent to which the new theory or approach, explains the observed behavior of Nigeria's balance of payments.

### **1.3 IMPORTANCE OF STUDY**

The general relevance of the study lies in its attempt towards the understanding of the relationship between monetary policy and balance of payments problems. In particular, by using Nigeria as an empirical evidence, the research will provide quantitative information which will enable us know and when to use monetary policy to correct balance of payments problems. If a significant negative relationship is established between balance of payment and domestic credit expansion, the implication for monetary management will be that the manipulation of domestic credit by the monetary institutions or authorities will enhance balance of payments viability overtime especially at this critical moment of the nations economic circumstances. On the other hand, if no significant negative relationship is established, it follows that the Nigerian monetary and fiscal authorities should give greater priority to other policy instruments or measures to achieve balance of payments stability.

A further justification for the study is the benefit of applying the monetary approach to the theory of balance of payments adjustment mechanism; which like many other apparently revolutionary analytical tools and approaches, will be added to economists' kits and increase the stock of knowledge in economics.

Finally, it is also hoped that this study will serve as one of the studies or research work aimed at verification or refutation of balance of payments theories since any theory, regardless of its elegance in exposition or its sound logical consistency, cannot be established and generally accepted without some empirical testing.

### **1.4 SCOPE AND LIMITATIONS OF STUDY**

This study is a study of a developing country, Nigeria. The choice is made out of the researcher's interest given the nations economic circumstances. The period

covered by the research is twenty-four years period, 1963 – 1986. The availability of uniform data on the relevant variables informed our choice. The study does not consider all the components of balance of payments such as overall balance, the basic balance and reserve changes. Also, it excludes such monetary and real variables as exchange rate, interest rate, foreign price, and domestic price index.

## **1.5 ORGANIZATION OF WORK**

For a systematic and scientific approach, this research paper is divided into five chapters, which are further subdivided into sections. The introductory section presents the general introduction; the statement of problem; the importance of study; scope and limitations of study; and organization of work, as shown in chapter one. In section two, the relevant Literature is reviewed and the working hypotheses stated. The methodology of the research is presented in section Three. Section four concentrates on the presentation and analysis of regression results. The policy implications of such analysis or results are also identified. Section Five concludes the research.

## **2.0 LITERATURE REVIEW AND STATEMENT OF HYPOTHESES**

### **2.1 THEORETICAL LITERATURE**

From the earliest times, trade has involved discrepancies in values exchanged, settled in credit or money, and these discrepancies constitute the origin of the concept of “balance of payments” (Mundell, 1972:1). The term itself entered the English Economic Literature during the Mercantilist period, eventually replacing “over plus”, “remanne”, “overvalue”, “balance of accounts”, “balance of remittance”, and “grand balance of payments” (Viner, 1937:13-14). In its original usage, a ‘balance of payments’ meant an excess of payments over receipts and under the gold standard this excess meant a gold outflow. But the term soon acquired the neutral meaning of the “state of the balance of international accounts”, whether negative or positive. Thus one speaks of a “balance of payments problem” whether gold is flowing in or out, and the term “balance of payments theory” is used to cover the entire subject (Mundell, 1972:1-2).

Now the accounting balance of payments records both regular transactions and transactions made to settle any gap between regular purchases and sales. In other words the accounting framework records the international exchange of goods and services and movement of capital. This measurement of international economic performance is divided into three accounts: the current account, the capital account and the cash account. The current account records all transactions of goods and services and unrequited transfers in a country: they are referred to as autonomous transactions and they help to determine rather than depend on the balance of payments. On the other hand, the capital account records all exchanges and money capital for various kinds of real or financial assets. Thus, the capital account transactions are “compensatory transactions” as they often only reflect short falls or surplus as might occur in the current account and the cash account therefore, is that part of the balance of payment that is referred to as the “balancing item”, or reserve movements. It wipes out such discrepancies that might arise, like when the volume of transaction of commodities and assets do not balance as they should (Ellsworth and leith, 1975: 304-361).

The balance of payments is related to other aspects of the economic system because it describes the transactions of all the residents of the country with the rest of the world. These connections have given rise to various approaches to balance of payments analysis. The classical international theory therefore began with David Hume’s refutation, by use of the analysis of the price-specie-flow mechanism, of the mercantilist belief that a country could achieve a persistent balance of trade (payments) surplus by import-substituting and export-promoting policies. The price-specie-flow mechanism made a key part of the mechanism of adjustment a temporary rise or fall of the general price level in the country experiencing excessive or deficient supply of money relative to demand. This relative price level movement leading to a balance-of-trade deficit or surplus, and

the deficit or surplus altering the stock of money in the direction of equilibrium. The need for price level movements was disputed by latter writers, who based their argument on the principle of commodity market arbitrage; but in any case it was understood by most classical writers that what was in question was general movements of national price levels, not alterations in the terms of trade.

The 'elasticity's' approach, associated with Robinson (1937) and chronologically the first of 'non classical' or 'Keynesian' approaches to the balance of payments theory and analysis maintains that or involves a straight forward application of marshallian partial equilibriums analysis to the separate markets for exports and imports on the assumption that capital movements are excluded so that an excess or deficiency of the value of exports in relation to the value of imports gives rise to a balance of payments surplus or deficit as one aspect of equilibrium.

In the Keynesian multiplier approach, Harberger (1950:47-60) and Laursen and Metzler (1950:281-299) simplified the approach by assuming a two-good international economy (exportable and importable goods only) and production of export good at constant domestic money cost. It hypothesizes that the extra demand for domestic output created by a successful devaluation will be satisfied by re-employing some of the unemployed and that, because part of it will be saved, the extra income generated by increased employment will not increase demand enough to wipe out the initial improvement in the balance of payments.

In the absorption approach, Alexander (1952:263-278) argues that devaluation will produce inflationary price rises that will cancel out the initial relative price effect, unless inflation itself deflates the aggregate demand for goods through an income redistribution effect or through a reduction in the real value of existing money balances.

In the 'economic policy approach', Tinbergen (1952) and Meade (1951) improved substantially on previous approaches by analyzing devaluation, not as an arbitrary policy change whose positive effects on the equilibrium of the international economy were to be analyzed, but as one of the two independent policy instruments (wage price flexibility and devaluation) required to achieve the two policy objectives of full employment (internal balance) and a balanced balance of payments (external balance).

The implicit assumption inherent in these approaches is that balance of payments disequilibria are permanent. However, these theories differ from one another in emphasis as well as point of departure but they are reconcilable in terms of their analytical apparatus and policy implications.

In recent years, a new approach, which centers on the idea that the balance of payments is essentially a monetary phenomenon, has developed. It originated in the 1950, by Polak (1957:1-50) and his associates at the international monetary fund and developed in the 1960s and early 1970s by Mundel (1968) and Johnson

(1972:1555-1572). However, modern academic work on the approach is often traced to the Meade-Tinbergen of internal and external balance in the early 1950, developed further in the 1960s. Mundel demonstrated that monetary policy is more effective than fiscal policy, in attaining external balance, basically because monetary policy improved both the current and capital accounts of the balance of payments. Presumably therefore, it was this concentration on monetary policy and on the overall balance-of-payments position, coupled with the gradual realization that with perfect capital mobility the money supply ceased to be controlled by the monetary authorities even in the short-run that led Mundell and Johnson to develop the modern monetary approach. Thus Mundell and Johnson with the help of graduate students at the university of Chicago were led to develop an entirely different analytical framework and offer it as a substitute for the traditional approaches. What emerged is a cohesive body of theory that becomes known as the monetary approach to the balance of payments (Kreinin and Officer, 1978:32-33). The essence of the approach is a consistent insistence that the balance of payments is a 'monetary' and not a real phenomenon as posited by the conventional theories. The major point of departure of the new approach is the recognition of the fact that a country imbalance of payments deficit (surplus) would *ceteris paribus*, experience a change in its money stock. The persistent deficits run down the stock of money and perennial surpluses build up the stock and sooner or later, the spending pattern changes such that the imbalance is soon eliminated (Johnson and Kiezkorishi, 1915:117).

The main distinguishing feature of the new approach to payments problem is its focus upon the monetary implications of balance of payments disequilibria. That balance of payments problems are monetary problems in a monetary world economy is basically the assertion of the proponents of the approach. Therefore the relevant concept of the balance of payments refers specifically to the official settlement balance or the money account (Musa, 1976:147-167).

In most literature on this "monetary-than-real phenomenon" feature of the approach, efforts are made to dispel the idea that the new approach does not give 'real' factor a place in its analysis. Musa (1976:189) argues that the monetary approach is an essentially monetary phenomenon and further explains, "...to say something is an essentially monetary phenomenon says that money plays a vital role, but does not imply that only money plays a role". Frenkel and Johnson (1976:24) state, "...Monetary approach asserts either that monetary mismanagement is the only cause nor that monetary policy is the only possible cure, for the balance of payments problems; it does suggest that monetary processes could bring a cure for some kind. However, it is pertinent to note that Gervaise (1720) is among the first to emphasize the link that as long as the exchange rate is fixed, monetary policy in the form of control over credit creation has a direct effect on the balance of payments. It is quite clear from these statements why the monetary approach to the balance of payments views the balance of payments as essentially monetary phenomenon.

Furthermore, the proponents of this approach formulate the balance of payments surplus in terms of difference between the demands for money and the actual money supply both in the stock sense. Here, there is the assertion that a balance of payments surplus would only result from balance of payments policies that increase the quantity of money demanded and “domestic credit policy forces the resident population to acquire such extra money wanted through an excess of receipts over out payments”. The monetary approach also asserts that national price levels are pegged to the given world price level and must move “rigidly in line” with it and hence prices of other countries John (1972:153) justified this assumption on the ground that among the industrial countries, industrial competition is endemic and because of this fact inter country elasticity’s of substitution among products tend more towards infinity than the relatively low numbers implicit in the elasticity approach.

In terms of time dimension, the monetary approach to the theory of balance of payments adjustment mechanism is a long run phenomenon. Musa (1976:193) noted this phenomenon by stating that the basic feature of the monetary approach is a concentration on the long run consequences of policy and parametric changes for the behavior of the balance of payments coupled with an eclectic view of the processes through which these long run consequences come about. The new approach further recognizes the existence of reserve-currency-countries and incorporates in its analysis reserve currencies held as substitute for international money. It provides a framework within which it is possible to assess the impact of monetary disturbances in a world, which there is at least one reserve currency (Johnson, 1976:162-163).

The theoretical underpinning of the monetary approach to the theory of balance of payments adjustment mechanism or the theoretic foundations of the new approach is anchored in the demand for money function (Johnson, 1976:156-157). Grubel (1981: 432-434) derived briefly the equation system or the formal model of monetary approach, which underlies the most important and central studies, and generally the model can be defined or presented in nine different steps.

Let us assume that the money demand function has the following form:

$$M = \frac{(P^a Y^b)}{(i^c u)} \dots \dots \dots (1)$$

- Where Md = demand for money
- P = price index
- Y = real income or output
- i = rate of interest
- a = Price } } elasticity’s of demand
- b = Income } } for money
- c = interest }
- u = error term

The main characteristics of this mathematical specification of this money demand function are that the quantity demanded is an increasing function of the price and income levels, and a decreasing function of the interest rate. The money supply function is assumed to be:

$$M_s = mH \dots\dots\dots(2)$$

Where  $M_s$  = money supply  
 $m$  = money multiplier  
 $H$  = high-powered money

The link between the foreign sector and the domestic money market is established by considering that the high-powered money base consists of a domestic component and a foreign component.

$$H = R + D \dots\dots\dots(3)$$

Where  $H$  = high-powered money  
 $R$  = foreign component of high powered money  
 $D$  = domestic component of high powered money

Substituting Equation (3) into (2) yields

$$M_s = m(R+D)$$

And expressing R and D as a proportion of H yields:

$$M_s = m \left\{ \frac{R}{H} + \frac{D}{H} \right\} H \dots\dots\dots (5)$$

In equilibrium, money demand and supply are equal

$$M_d = M_s \dots\dots\dots(6)$$

Through substitution of (1) into (5) and (6) we get:

$$mH \left\{ \frac{R}{H} + \frac{D}{H} \right\} = \frac{(P^a Y^b)}{(i^c u)} \dots\dots\dots(7)$$

Taking logarithms of (7) and differentiating with respect to time yields:

$$G^m + \frac{R}{H} g^R + \frac{D}{H} g^D = ag^P + bg^Y - cgi \dots\dots(8)$$

Where g for each variable in the equation is

$$G_x = \frac{1}{X} \frac{dx}{dt} \quad (x = M, R, D, Y, P, \text{ and } I)$$

Rearranging Equation (8) to make  $\frac{R}{H} (g^R)$  the dependent variable on the left hand

Side, we arrive at the equation used for estimation.

$$\frac{R}{H} g^R = a g^P + b g^Y - c g^I - g^m - \frac{D}{H} g^D \dots\dots(9)$$

In words, equation (9) says that the weighted growth rate of reserves is a decreasing function of the weighted growth rate in the domestic component of the high-powered money base after adjustment for the exogenous growth in the other variables influencing the transactions demand for money: real income, prices and interest rates, and changes in the money multiplier. Furthermore, the equation implies that if the growth rates of price, income, interest, and the money multiplier are zero and therefore the economy requires no changes in the supply of money to satisfy increases in the transactions demand for money, then growth in the high-powered money base  $D$ , influences the growth of reserves  $R$  directly and in a magnitude determined by the relative sizes of  $\frac{R}{H}$  and  $\frac{D}{H}$ . Any positive growth in the money base,  $D$ , controlled by the

authorities therefore are the immediate cause of the reserve bss and the opposite holds when the growth of  $D$  is negative.

Alternatively, if we assume only interest rate, prices and money multipliers to be constant,

$$\frac{R}{H} g^R = b g^Y - \frac{D}{H} g^D$$

That is weighted growth rate of reserves is a decreasing function of the weighted growth rate in the domestic component of high-powered money base and an increasing function of growth rate of output. Simplifying further by assuming no domestic growth rate ( $g^Y = 0$ ).

$$\frac{R}{H} g^R = - \frac{D}{H} g^D$$

That is weighted growth rate of reserves and balance of payments is inversely related to the weighted growth rate in the domestic component of the high-powered money base.

Now the above results are to be contrasted with various Keynesian theories about the relation between economic growth and the balance of payments. According to one such theory derived from the multiplier analysis, economic growth must worsen the balance of payments through increasing imports relative to exports;

this theory neglects the influence of demand for money on export supply and import demand and on the international flow of securities. According to another and more sophisticated theory, domestic credit expansion will tend to improve the balance of payments by stimulating investment and productivity increase and so lowering domestic prices in relation to foreign prices and improving the current account through the resulting substitutions of domestic for foreign goods in the foreign and domestic markets. This theory begs a number of questions even in naïve Keynesian terms, in terms of the present approach it commits the error of attempting to deduce the consequences of domestic credit expansion from its presumed relative price effects without reference to the monetary aspect of balance-of-payments surpluses and deficits (Johnson 1976:158).

At this juncture, the theoretical literature will be incomplete if we fail to highlight various writings on the defects of the new monetary approach to the theory of balance of payments adjustment mechanism. Writing on the defects Musa (1976: 190) asserts that the monetary approach is defective in the sense that it attempts to provide a theory of the net sum without attempting to explain its decomposition. There is the disturbing lack of consensus on the most critical concept on which the approach lies – namely the demand for money function and this was why Tsiang (1977:320) noted that the casual way in which one specification of the function is picked in preference to the others does not inspire much confidence.

Another related issue is the failure of proponents of the monetary approach to distinguish between the transaction precautionary and speculative demand for money. If we accept the decategorization of the motives for the demand for money and the consequent building, of the different motives in to one ‘super motive’ represented by the speculative motive, it is obvious that in the event of a liquidity trap, the monetary approach loses its predictive power (Tsiang, 1977:323). We should be left with a situation in which the balance of payments would be whatever was dictated by exclusively non-monetary factors. Another defect is the “small country” assumption of the monetary approach. The assumption that the country under analysis is so small that it is a price taker in world trade poses some analytical problems and also too limiting to have relevance to practical policy problems. However, Frenkel and Johnson (1976:27-28) countered this criticism by asserting that the terms of trade play only a secondary role.

Since the monetary approach seems applicable only in a regime of fixed exchange rate, the impression then is that only countries in a currency union or otherwise linked by exchange rates that are guaranteed to remain rigidly fixed would find the monetary approach relevant. With flexible exchange rate and less than full employment expansionary monetary policy would have a negative effect on foreign income (Mundell, 1964:421). The new approach has also been criticized of the time dimension element and difficulties associated with the empirical testing of its theoretical propositions. More so, the role, which the monetary approach, arrogates to international reserves as the channel for feedbacks of

external transactions on the domestic system, is not clear (Backwell, 1972:71). Settlement in overall balance of payments does not necessarily involve transfer of international reserves that affect domestic economy.

## **2.2 EMPIRICAL LITERATURE**

The following empirical literature on monetary approach to balance of payments theory is comprehensive but not exhaustive. Since any theory can be judged by the accuracy of its predictions or by the validity of its assumptions, the empirical studies reviewed will therefore cover both types of test. In this review, the studies whose result upholds the theoretical propositions of the monetary approach are termed studies with positive result while those, which did not, are termed negative. However, studies with neither positive result nor negative result are taken to be studies with mixed result. The technique of regression analysis used in these studies was ordinary least squares.

A major premise of the monetary approach is that under a fixed exchange rate, changes in a country's reserves are as a result of excess demand for or supply of money as a stock. This proposition is tested by what has become known as 'reserve-flow equation' (Krein and Officer, 1976:35). A reserve flow equation is an equation in which the dependent variable is either the level of the country's international reserves, the change in reserves or the rate of change in reserves (Connolly and Taylor, 1976:849-859). The explanatory variables were interest rate, Government Expenditure, money multiplier, money stock, price index, exchange rate (number of units of domestic currency per unit of foreign currency), demand for nominal and real money balances and so on. Within this range, the explanatory variables may however vary from study to study.

Using this equation, three studies got negative results: a study of fifteen industrial countries for the time period between 1958 and 1968 (Courchene, 1973: 65-84); a study of five less developed countries for the time period between 1948 and 1973 (Sargen, 1975:31-48); and a study of seven European countries for the time period between 1959 and 1970 (De Granwe, 1976). Equally, three studies got positive results: a study of fourteen industrial countries for the time period between 1960 and 1969 (Courchene and Singh, 1976:189-215); a study of United Kingdom for the time period between 1952 and 1971 (Akhtar, Putnam, and Wilford, 1977); and a study of Canada and Mexico for the time period between 1963 and 1969, and between 1954 and 1974 (Cos and Wilfor, 1977). Still using the reserve flow equation, seven studies got mixed results: a study of Japan for the time period between 1959 and 1970 (Bean, 1976:326-327); a study of thirteen less-developed countries plus Finland for the time period between 1957 and 1972 (Connolly and Taylor, 1976:849-859); a study of thirteen less developed countries plus seven developed countries for the time period between 1952 and 1972 (Connolly and Taylor, 1977); a study of Sweden for the time period between 1950 and 1968 (Genberg, 1976:298-325); a study of thirty-nine less developed countries for the time period between 1957 and 1966 (Aghevli and Khan, 1977:275-290); a study

of Spain for the time period between 1955 and 1971 (Guitan, 1976:338-356); and finally a study of Australia for the time period between 1950 and 1971 (Zecher, 1976:287-297).

A variant of reserves-flow equation is capital flow equations. For the authors embracing this variant, the only balance of payments transaction induced is a private capital flow. In this equation, the dependent variable was either the net private capital in flow or the net private short-term capital inflow. The explanatory variables were current-account balance plus net official capital inflow, net private long-term capital inflow and some of the regressors of reserve-flow equation. Using this equation Porter (1972:395-422) carried out an empirical test on Germany for a seven-year period (1963-1970) and got a negative result. Others who used this equation got mixed results: Kour and Porter (1974:443-467) for Australia, Italy, Netherlands (1960-1970) and Germany (1960-1971); Hodjera (1976:598-623) for Austria, France (1960-1971); and Neuman (1978:131-142) for Germany (1963-1970).

Furthermore, others also used a different equation in the empirical test. Under a pegged exchange rate, the reserve flow and capital flow equations are used to test the theoretical propositions of the monetary approach. With a floating exchange rate these equations give way to an “exchange rate equation” in which the dependent variable is the exchange rate, defined as the domestic currency price of foreign exchange. Since we are not interested in the exchange rate explanation but rather in the explanation of balance of payments outcome, there may not be need for review of studies using the exchange rate equation.

In an impressive extension of the afore mentioned monetary models, Girton and Roper (1977:537-548) derive an equation that integrates the reserve flow and exchange market equations. The resulting equation is “exchange-market pressure equation” which has as the dependent variable the sum of the change in reserves as a percentage of the monetary base and the rate of appreciation of the domestic currency. The equation is therefore usable for periods encompassing fixed rates, freely fluctuating rates, and managed floats. Using this equation, Girton and Roper (1977:537-548) carried out an empirical study of Canada for a twenty-two year period (1952-1974) and got positive result. Finally, Sargen (1975) got a mixed result from an empirical study of Australia, Canada, Germany, Japan and United Kingdom, for the time period between 1952 and 1975.

It is interesting to note, from a close examination of the studies reviewed above, that the number of studies we consider to yield negative results concerning the monetary approach is approximately equal to the number that produce positive results. Also, and perhaps more revealing, the vast majority of studies, viewed independently of one another provide mixed findings. This suggests that the empirical evidence is inconclusive. Again, it seems that three of the models used in the empirical studies – reserve flow, capital flow, and exchange rate equations – do not produce conclusive results. However, the fourth model, the exchange

market pressure equation yields results that, while mixed balance, are positive for certain countries.

### **2.3 LIMITATIONS OF PREVIOUS STUDIES**

In one-way or the other, most of the studies reviewed have made useful contributions to the understanding of the proposition that 'Balance Payments is a monetary phenomenon' in the context of monetary approach to balance of payment theory and adjustment. However, the empirical studies undertaken so far test the new theory "in isolation," in no way is it pitted against the traditional approaches and the researchers must have gone too far in emphasizing monetary variables to the virtual exclusion of everything else. The empirical literature also revealed that none of the studies was on a West African country and Nigeria in particular.

The researcher of this work therefore intends to improve on the reviewed studies by using Nigeria as empirical evidence, to test the theoretical proposition of the monetary approach to theory of balance of payment adjustment mechanism. We shall also include some non-monetary variables in our model. A longer time period will be employed in our analysis or empirical test.

### **2.4 STATEMENT OF WORKING HYPOTHESES**

The research is guided by the following hypotheses:

H<sub>01</sub>: There is no negative and significant relationship between monetary variables (domestic credit) and balance on current account.

H<sub>11</sub>: There is a negative and significant relationship between monetary variables (domestic credit) and balance on current account.

H<sub>02</sub>: There is a significant relationship between balance on current account and real variables (Government expenditure and Gross Domestic Product).

H<sub>12</sub>: There is no significant relationship between balance on current account and real variables (Government expenditure and Gross Domestic Product)

H<sub>03</sub>: Relative to monetary variables, real variables is more important in explaining variations in balance on current account.

H<sub>13</sub>: Relative to monetary variables, real variables are not more important in explaining variations in balance on current account.

## 3.0 METHODOLOGY

### 3.1 RESEARCH METHOD

Scientific or empirical research can be carried out by four possible alternative methods, namely, the comparative method, the econometric method, the experimental method, and the case history method. The nature of the problem under investigation and the objectives of the research will determine which of these alternatives will be adopted. They may be adopted singly or combinational.

The econometric method is the approach employed for the research. There is no doubt that the method will facilitate the model specification, parameter estimation and appropriate econometric tests.

### 3.2 MODEL SPECIFICATION

The first, and most important step the econometrician has to take in attempting the study of any relationship between variables is to express this relationship in mathematical form, that is to specify the model with which the economic phenomenon will be explored empirically (Koutsoyiannis, 1977:12).

In the model specified below, I intended to investigate the impacts of monetary and real variables on balance on current account. The explanatory variables include the total domestic credit, or its components (Credit by Central Bank and Credit by Commercial Banks), Gross Domestic Product and Government Expenditure. Explicitly, the equations for estimation, and the expected signs of the coefficients are presented below:

$$B_{CA} = a + bDC + e_i \quad b < 0 \dots\dots\dots(1)$$

$$B_{CA} = a + bBN + e_i \quad B < 0 \dots\dots\dots(2)$$

$$B_{CA} = a + bCB + e_i \quad B < 0 \dots\dots\dots(3)$$

$$B_{CA} = a + bY + e_i \quad B > < 0 \dots\dots\dots(4)$$

$$B_{CA} = a + bGE + e_i \quad B < 0 \dots\dots\dots(5)$$

$$B_{CA} = a + b_1 DC + B_2 Y + e_i \quad b_1 < 0, b_2 > < 0 \dots\dots\dots(6)$$

$$B_{CA} = a + b_1 CBN + B_2 Y + e_i \quad b_1 < 0, b_2 > < 0 \dots\dots\dots(7)$$

$$B_{CA} = a + b_1 CB + B_2 Y + e_i \quad b_1 < 0, B_2 > 0, \dots(8)$$

$$B_{CA} = a + b_1 CBN + B_2 GE + e_i \quad b_1 < 0, B_2 < 0, \dots(9)$$

$$B_{CA} = a + b_1 CB + B_2 GE + e_i \quad b_1 < 0, B_2 < 0, \dots(10)$$

Where

BCA = Balance on Current Account

DC = Aggregate Credit to Domestic Economy

CBN = Credit by Central Bank of Nigeria

CB = Credit by Commercial Bank

Y = Gross Domestic Product at 1974 constant prices

GE = Government Expenditure

$e_i$  = Stochastic error term

### 3.3 ESTIMATION PROCEDURE

The ordinary least squares single equation technique is the estimation procedure chosen for this study. It will be used for estimating the equations already specified in section (3.2). As a justification for this method, Maddala (1977:23) identified that ordinary least squares is more robust against specification errors than many of simultaneous equation methods and also that predictions from equations estimated by ordinary least squares often compare favorably with those obtained from equations estimated by the simultaneous equation method. Among other reasons is the simplicity of its computational procedure in conjunction with optimal properties of the estimates obtained and these properties are linearity, unbiasedness and minimum variance among a class of unbiased estimators.

Now, for the ordinary least squares method (which depends on the minimization of the sum of squares of the error) to be applied, certain explicit assumptions must be made about the behavior of non observable error term (Koutsoyiannis, 1977:118). They are as follows:

**Assumption 1 (Randomness of Error term)**

**The variable U is a real random variable**

**Assumption 2 (Zero mean of error term)**

**The random variable U has a zero mean value for each  $X_i$ , that is**

$$E(U_i) = 0$$

**Assumption 3 (Homoscedasticity)**

**The variance of each  $U_i$  is the same for all the  $X_i$  values, that is,**

$$E(U_i^2) = \sigma_u^2 \text{ constant}$$

**Assumption 4 (Normality of error term)**

**The values of each  $U_i$  are normally distributed, that is**

$$U_i \sim N(0, \sigma_u^2)$$

**Assumption 5 (Non autocorrelation or serial independence of the U's)**

**The values of  $U_i$  (Corresponding to  $X_i$ ) are independent from the values of any other  $U_j$  (Corresponding to  $X_j$ ), that is  $E(U_i U_j) = 0$  for  $i \neq j$**

**Assumption 6 (Independence of  $U_i$  and  $X_i$ )**

**Every disturbance term  $U_i$  is independent of the explanatory variables. That is  $E(U_i X_{1i}) = E(U_i X_{2i}) = 0$**

**Furthermore, the validity of ordinary least squares technique requires the following assumption:**

**Assumption 7 (No multicollinearity)**

**Two or more regressors in a multiple regression are not sufficiently**

$$\text{Corrected } E(X_s X_t) \neq 0$$

### **3.4 TECHNIQUE FOR EVALUATION OF RESULTS**

The technique for evaluation of results implies the use of the following standard criteria:

$R^2$  (adjusted  $R^2$  for degrees of freedom) for testing goodness of fit of our estimated regression equation; F (ratio) for testing the significance of the regression coefficient; t (ratio) for testing the significance of each regression coefficient; and 'd' statistic (Durbin-Watson) for testing the randomness of the residuals.

Finally, a priori sign and magnitude of the coefficients will be used to evaluate the results and tests conducted to ensure that the assumptions of the ordinary least square method are fulfilled.

### **3.5 DATA NEEDED AND SOURCES**

Annual time-series data on the variables under study covering twenty-four year period 1963-1986 are used in this study for estimation of functions. The balance on current account is explicitly considered because if we assume no capital movements, any analysis made from the standpoint of the flow market for money is equivalent to analysis made in terms of the market for goods and services. Aggregate credit to Domestic economy, credit by central bank and credit by commercial bank are the relevant monetary variables as postulated by the theory under study. Equally, the relevant real variables are Gross Domestic Product and Government Expenditure.

Data were collected from the 1976 and 1980 (2<sup>nd</sup> edition) of the World Bank, World Tables; various issues of central bank of Nigeria Economic and Financial Review; Annual reports and Statement of Accounts; and Principal Economic and Financial Indicators. Table 3.1 presents the regression data.

Table 3.1

## DATA FOR REGRESSION

1	BCA: 2 BALANCE ON CURRENT ACCOUNT (N MILLIONS)	DC: 3 AGGRAGATE CREDIT TO DOMESTIC ECONOMY (N MILLIONS)	CBN: 4 CREDIT BY CENTRAL BANK (N MILLIONS)	CB: 5 CREDIT BY COMMERCIAL BANK (N MILLIONS)	Y: 6 CROSS DOMESTIC PRODUCT (1974 CONSTANT PRICES) (N MILLIONS)	7 GOVERNMENT EXPENDITUR (N MILLIONS)
1963	-119.0	254.4	64.6	189.8	7210.4	330.0
1964	-173.0	338.6	75.6	265.0	7401.1	384.0
1965	-127.4	336.4	56.8	279.6	7803.6	444.1
1966	-118.4	415.0	92.4	322.6	7550.7	450.0
1967	-116.0	467.0	159.0	308.0	6384.3	426.1
1968	-168.2	613.0	186.6	426.4	6308.4	504.0
1969	-108.6	825.8	244.0	581.8	7999.2	840.0
1970	50.0	1140.2	277.4	863.0	10267.0	1155.9
1971	-229.4	1122.0	326.0	796.6	11542.6	1262.0
1972	-322.7	1269.2	265.2	1004.0	11929.8	1545.9
1973	52.7	1342.5	223.8	1114.1	12585.6	1952.1
1974	3062.5	-389.9	-1965.3	1570.7	13915.1	2624.0
1975	42.6	488.6	-1600.8	2083.3	13652.7	4473.9
1976	-259.3	2617.3	-337.6	2948.1	15309.7	5169.9
1977	-647.5	5608.8	1502.9	4098.9	16137.8	7654.0
1978	2386.9	8059.9	2821.1	5238.8	14863.0	9998.1
1979	1009.5	8855.3	1814.0	7041.3	15448.9	9964.0
1980	2355.3	10780.1	1713.2	9066.9	15892.7	10102.0
1981	-3998.4	16261.4	5491.3	10170.1	15428.0	13238.0
1982	-5211.2	21899.7	8475.0	13424.7	15428.9	13631.6
1983	3137.9	28182.1	11591.0	16591.1	14113.3	14968.0
1984	88.8	31141.6	10711.5	20430.1	13337.1	13850.0
1985	1108.9	32680.3	10265.3	22415.0	13494.3	14683.9
1986	654.9	3682.2	16510.8	20309.4	13046.0	14976.0

SOURCE: Columns (2) and (7) are derived from Central Bank of Nigeria, Nigeria's Principal Economic and Financial Indicators (1970-1985) and Annual Report and Statement of Accounts (Various issues); Columns (3), (4) and (5) are developed from Central Bank of Nigeria, Annual Report and Statement of Accounts (Various issues) and Economic and Financial Review (Various issues). Column (6) is developed from World Bank, 1976 and 1980 World tables and Central Bank of Nigeria, Nigeria Principal Economic and Financial Indicators (Various issues).

## **4.0 REGRESSION RESULTS AND ANALYSIS**

The results of the ordinary least squares regressions of the key functions specified in 3.1 are presented in this chapter. The estimates are subjected to various statistical tests. On the basis of the empirical findings provided by the results, the hypotheses of the research are evaluated.

### **4.1 PRESENTATION OF REGRESSION RESULTS**

To report all the estimating steps and processes one has tried in reaching his final results would be tedious and boring to his reader. Therefore, the reported regression equation represents only a small part of the work a researcher in the empirical world has done (Rao and Miller, 1971:81). The ordinary least squares estimates of the key functions specified in table 3.1 are shown in table 4.1. In this table, the figures in parentheses under the parameter estimates are the corresponding t-ratios.  $R^2$  is the corrected or adjusted coefficient of multiple determinations, which is a general indication of the goodness of fit or the explanatory power of the equation. SER is the standard error of the estimate – Fs are the variate ratio used in statistical test of significance. D.W. is the Durbin-Watson 'd' statistic used in the test of autocorrelation.

Table 4.1

NIGERIA: THE CURRENT ACCOUNT AND SPECIFIED REGRESSORS

Equation	Constant	DC	CBN	CB	Y	GE	R <sup>2</sup>	Fs	SER	D.W.
1	0.34	0.307 (1.02)					0.0016	1.038	3.404	2.317
2.	0.833		0.314 (1.31)				0.029	1.706	3.356	1.685
3	-7.502			1.327 (3.78)			0.365	14.267	2.713	2.856
4	-51.52				5.81 (2.92)		0.246	8.52	2.957	1.937
5	-8.399					1.421 (3.61)	0.342	12.98	2.763	2.553
6	-52.42	0.38 (1.27)			5.94 (2.6)		0.211	0.016 (DC) 6.848 (Y)	3.026	
7	-48.84		0.17 (0.72)		5.41 (2.61)		0.233	0.624 (CB) 6.848 (Y)	2.98	
8	-12.008			1.24 (2.0)	0.55 (0.17)		0.336	3.982 (CB) 0.0303 (Y)	2.775	
9	-8.446		-0.31 (1.38)			1.45 (3.15)	0.311	0.019 (CBN) 10.2 (GE)	2.826	
10	-7.678			1.186 (0.82)		0.161 (0.11)	0.336	0.784 (CB) 0.012 (GE)	2.776	

The number in parentheses are t values

#### 4.2 STATISTICAL TESTS OF SIGNIFICANCE

In this study, two types of test are conducted: the test for the statistical significance of each estimator (t-test) and similarly the test of the estimator's significance (f-test). The tests are conducted at the 95% confidence level.

In a given regression equation with k regressors for estimator's test of significance, the null hypotheses is:

$$H_0 : b_i = 0$$

And the alternative hypothesis is

$$H_1 : b_i \neq 0$$

For a decision the observed F-ratio,  $F_s$ , is compared with the theoretical F-ratio,  $F_{0.05}$ , which has  $V_1 = k-1$ ,  $V_2 = N-K$  degrees of freedom;  $N$  is the sample size and  $K$  is the total number of parameters estimated.

The decision rules are:

- (i) If  $F_s > F_{0.05}$ , Reject  $H_0 \Rightarrow$  the regressor have a significant influence on the dependent variable;
- (ii) If  $F_s < F_{0.05}$ , Accept  $H_0 \Rightarrow$  the regressor have an insignificant influence on the dependent variable.

Furthermore, two-tailed tests are conducted by comparing the observed t-ratio,  $t_s$ , with the theoretical t-ratio,  $t(0.025)$  that has degrees of freedom  $N-K$ . The null and alternative hypotheses are respectively,

$$H_0 : b_i = 0$$

$$H_1 : b_i \neq 0$$

The decision rules are:

- (i) If  $|t_s| > |t(0.025)|$ , Reject  $H_0 \Rightarrow b_i$  is not zero and  $i$ th regressor influence, the dependent variable significantly;
- (ii) If  $|t_s| < |t(0.025)|$ , Accept  $H_0$ ,  $b_i$  is not statistically different from zero and  $i$ th explanatory variable does not influence the regression significantly.

Now, from the 'F' distribution table, the theoretical F-ratios at 5% significance level are 4.30 and 3.47 for the cases of one and two regressors, respectively. From the student's 't' distribution table, the theoretical t-ratio for two-tailed test at 5% significance level are 2.07 and 2.08 for the cases of one and two regressors respectively. At this point, these theoretical ratios are compared accordingly with the  $F_s$  of the various estimators and observed t-ratio ( $t_s$ ) for each parameter; and next we simply summarize which equations are significant or not.

In equations (1) and (2), both tests revealed that Aggregate credit to Domestic Economy and Credit by Central Bank were respectively insignificant in explaining current account balance. However, both tests indicated that credit by Commercial Bank, Gross Domestic Product and Government Expenditure were respectively significant in equations (3), (4) and (5).

In multiple (three variables) regression equations (6), (7), (8), (9) and (10), both tests also revealed the significance of each estimator. While Aggregate Credit to Domestic economy was insignificant Gross Domestic Product was statistically significant in equation (6). (7) Showed that credit by Central Bank and Gross Domestic Product were insignificant and significant respectively. In equation (8), credit by Commercial Bank was significant while Gross Domestic Product was not significant. Also in equation (9), the insignificant of credit by Central Bank was seen. However, Government Expenditure was significant. And finally, equation (10) showed that both credit by Commercial Bank and Government Expenditure were insignificant in explaining current account balance, as revealed by F-test and t-test.

#### 4.3 **EXAMINATION OF ALGEBRAIC SIGNS OF PARAMETER ESTIMATES**

How far do the directions of the influences of the various explanatory variables on the external account (balance on current account) conform to the a priori expectations as shown in 3.2. This question is warranted since any reliable estimated regression equation is expected to conform to the priori restrictions imposed or determined by the theoretical underpinning of the study in question. They are examined below.

In simple regression equations, (1), (2) and (3), the coefficients of Aggregate Credit to Domestic Economy, credit by Central Bank and credit by Commercial Bank did not conform to the expected negative sign respectively. This was also the case with the coefficient of Government Expenditure in equation (5) as the wrong positive sign was got. However, the coefficient of Gross Domestic Product conforms to the expected 'positive' sign.

In multiple regression equations (6), (7) and (8), the coefficients of Aggregate Credit to Domestic Economy, credit by Central Bank and credit by Commercial Bank did not conform to the expected sign respectively. However, the same equations showed the coefficients of Gross Domestic Product to be positive as expected. In equation (9), the coefficient of credit by Central Bank conformed to the expected negative sign but the coefficient of Government Expenditure did not. And finally, in equation (10), both the coefficient of credit by Commercial Bank and coefficient of Government Expenditure did not conform to the expected negative sign.

A common cause of worry in empirical research is the appearance of 'wrongly' signed coefficients in regression models. It is the view of Rao and Miller (1971:46) that if specification or interpretation of the coefficients is correct, a coefficient can still attain a wrong sign because of the sampling distribution of the estimates. If this is the case, we generally observe the coefficients to be not significantly different from zero statistically. Now the 'wrong' signs in some of our multiple regression results are consistent with the signs in the simple regression results and no error is detected in the definition or interpretation of variables. Also, an observation of the monetary variables show on increasing pattern while current account balance show non-systematic pattern and finally,

our F-test and t-test tend to suggest the non significance of some of our explanatory variables.

However, in some of the equations, the coefficient of credit by Commercial Bank and Government Expenditure were significant but Rao and Miller (1971:46) noted that, when the coefficient is significantly different from zero statistically and has the wrong sign, then some aspect of the problem has not been unveiled and thus needs further investigation. We therefore urge future researchers to investigate further on the causes or empirical explanation of the wrong sign.

#### 4.4 **TESTS OF MULTICOLLINEARITY AND AUTO CORRELATION**

In applied econometric research, the realism of the assumptions of non-multicollinearity (or non-perfect collinearity) and non-autocorrelation are tested, in order to ascertain the reliability of the parameter estimates.

In multicollinearity test, the coefficient of multiple correlation,  $R$ , is compared with the simple correlation coefficient between two explanatory variables,  $r_m$ ; or with the partial correlation coefficient between any two independent variables,  $r_1$ . If  $r > r_m$  or  $R > r_1$ , it is very likely that there are no serious multi-collinearity in the equation concerned. If  $R < r_m$ , or  $R < r_1$ , it is likely that there is serious multi-collinearity. Alternatively, the easiest way to tell whether multi-collinearity is causing problem is to examine the standard errors of the coefficients. If several coefficients have high standard errors and dropping one or more variables from the equation lowers the standard errors of the remaining variables, multi-collinearity will usually be the sources of problem (Pindyck and Rubinfeld, 1981:70). However, this study is limited to simple regression equation and three variables multiple regression equation, hence the tendency for multi-collinearity to exist is small or not likely to be of serious problem.

In auto correlation test, we use D.W. Limits on a 5% level of significance and  $k$  degrees of freedom; to compare the theoretical lower and upper limits of the Durbin-Watson statistics  $d_l$  and  $4-d_l$  respectively, with the observed or computed D.W. statistics  $d_c$ .

- (i) If  $d_c < d_l$  or  $d_c > (4-d_l)$ , there is serious auto correlation;
- (ii) If  $d_c > d_l$  or  $d_c < (4-d_l)$ , auto correlation is not a serious problem.

The test is applied to some of the equation results of this study and the summary results is presented in table 4.2

**Table 4.2**

**RESULTS OF AUTO CORRELATION TESTS**

Equation No	Computed D.W. Dc	Theoretical d1	D.W. Limits 4- dl	Test Result
1	2.317	1.27	2.73	FSA
2	1.685	1.27	2.73	FSA
3	2.856	1.27	2.73	FSA
4	1.937	1.27	2.73	FSA
5	2.553	1.27	2.73	FSA

KEY TO RESULTS: FSA = Free of Serious Auto correlation.

The test results indicate that our regression equations are free of both errors. The implication being that the variances of the parameter estimates calculated on the classical multiple regression model assumption of non-multi-collinearity and auto correlation is valid.

**4.5 EVALUATION OF WORKING HYPOTHESIS**

The empirical evidence or test results presented in section 4.1 do support our first null hypothesis that there is no negative and significant relationship between monetary variables (domestic credit) and current account balance. However, credit by Commercial Bank was significant but positively related to the current account balance. The insignificance of credit by Central Bank and Aggregate credit to the Domestic Economy can be seen in their respective low adjusted coefficient of multiple determination ( $R^2$ ) and results of F-test and t-test.

The second null hypothesis that there is a significant relationship between the real variables and balance on current account tends to be supported by the empirical evidence. There was positive and significant relationship between Gross Domestic product and current account balance. Although Government Expenditure was significant in explaining current account balance, yet its coefficient had positive sign contrary to the expectation. Again, despite the significance of these real variables, they were associated with low adjusted coefficient of multiple determinations.

To evaluate the third hypothesis we have to examine equations (6) and (10) very critically. In combining Aggregate Credit to Domestic Economy and Gross Domestic Product as regressor in equation (6); and combining credit by Central Bank with the same real variable in (7), showed only the real variable to be significant in both equations. However, in equation (8), credit by Commercial Bank was found to be significant (with wrong positive signs) while Gross Domestic product was not. In equation (9) and (10), where credit by Central Bank, and Government Expenditure were used as regressors, we found these variables not significant in explaining current account balance. This evaluation

supports the third alternative hypothesis that relative to monetary variables, real variables (in this case, Gross Domestic Product) are more important in explaining variations in current account balance.

#### 4.6 **IMPLICATIONS OF RESULTS**

Obviously, the predictions of Economic theory do not always hold. For this reason and because, there are cases in which Economic theory does not have any explicit information, Economic theory should be complemented with empiricism. Empiricism would involve experimenting with different components of the aggregated variable as regressors to find the directions of their various impacts on the relevant dependent variable. However, the interpretation of all econometric studies leaves much room for judgments and this is true also for the studies of the monetary approach to the balance of payments. There are always questions about the Misuse of computations in the search for specifications that give “good” results, high correlation coefficients; high levels of confidence in the statistical significance of some or all regression coefficient; the finding of coefficients with theoretically expected sign and so on (Grubel, 1981:435). In cognizance of these facts, it is then expected that the possible implications of the results of this study should be taken with caution.

Generally, the results of this study tend to suggest that Nigerian Monetary and fiscal authorities should give greater priority to other policy instruments or measures than monetary tools to achieve balance of payments stability. From the various tests concluded and hypotheses evaluated, it might well imply that the manipulation of domestic credit by the Monetary authorities will not enhance the balance of payment viability over time rather that increases in the level of output (as indicated by significant positive coefficient of Gross Domestic product) might improve the balance on current account.

As a test of economic theory, the results of this study may well suggest to the inconclusiveness of the monetary approach to the theory of balance of payments adjustment mechanism as already suggested by most studies reviewed in section 2.2. In particular the results of the study imply that problems of the Balance of Payments, cannot, to a large extent, be traced to the monetary policies of Government.

Finally, for a developing country such as Nigeria, the conduct of any policy instrument is likely to be a difficult task. Thus the use of a policy tool to achieve a particular macro economic objective might not be realistically attainable. This tends to suggest the use of a coordinated optimal mix of policy instruments. However, a quantitative research such as the present study will recommend or

might help the relevant authorities or policy makers in ascertaining the weight to be assigned to each policy instrument. For instance the present study has revealed the relative importance of Gross Domestic Product to Domestic Credit in determining balance of payments outcome (current account balance). In essence, this means that policies directed to increase the level of output will invariably lead to favorable balance on current account, than domestic credit control policies.

## **5.0 SUMMARY AND CONCLUSION**

The main thrust of this research has been to investigate the theoretical proposition of the monetary approach to the theory of Balance of Payments adjustment mechanism. The investigation was an attempt to test or decide how well this postulation explains the observed behavior of Nigeria's balance of payments. Specifically, we are to establish the relationship between Nigeria's balance of payments and domestic credit expansion; and to ascertain the importance of domestic credit expansion relative to real variables in determining balance on current accounts outcome. The study was however, a study of a developing country, Nigeria, and the period covered by the research was twenty-four year period, 1963-1986.

In Chapter Two, the relevant literature (theoretical and empirical) was reviewed and working hypotheses stated. Starting with the origin of the balance of payments concept and accounting balance of payments framework, the theoretical literature examined the various approaches to the theory of balance of payments adjustment mechanism: Hume's price-specie flow mechanism, the elasticity's approach, the Keynesian Multiplier or income approach, the absorption approach and the policy approach, that stresses internal and external balance. In addition, a new approach, which centers on the idea that balance of payments is essentially monetary phenomenon, was reviewed. The essence of the approach is a consistent insistence that balance of payments is a monetary and not a real phenomenon as posited by the conventional theories. The major point of departure of the new approach is the recognition of the fact that a country in balance of payments deficit (surplus) would *ceteris paribus* experience a change in its money stock.

Furthermore, the essential features of the new approach and its defects were seen and the theoretical foundation stated. Turning to the empirical literature, four different equations were mostly employed by researchers: reserve flow equation, capital flow equation, exchange market equations and exchange-market pressure equation. A close examination of study by study evaluation shows that the number of studies considered to yield negative results is approximately equal to the number that produce positive results and perhaps the vast majority of studies, viewed independently of one another provide mixed findings. This suggests that the empirical evidence is inconclusive. These studies were limited mainly to developed countries and few of the less developed countries, hence, the need for a study of a West African country Nigeria. Against this background, three hypotheses were stated for the research.

Chapter three of the research was concerned with the methodology. Here, we employed the econometric method as the approach to the study. The method was expected to facilitate the model specification, parameter estimation and appropriate econometric tests. The model was specified to investigate the impacts of monetary and real variables on Balance on current account. The explanatory variables include the total domestic credit, or its components (credit by Central Bank and Credit by Commercial Banks), Gross Domestic Product and Government Expenditure. The possible expected signs of the parameter estimates were stated and the equations were of linear functional forms. For

purpose of the study and convenience, ten single equations (simple and multiple) were estimated and the ordinary least squares single equation was the estimation technique or procedure.

Furthermore, certain explicit assumptions about the behavior of non-observable disturbance term and validity of the regression technique were stated.  $R^2$ , F-ratio, t-ratio and 'd' statistics were techniques used for evaluation of results. Annual time series data on the variables under study covering twenty-four year period (1963-1986) were used for estimation of functions. Data for the research came mainly from World Bank publications and Central Bank of Nigeria publications.

The results of the ordinary least squares regression of the key functions specified were presented in Chapter Four. Two types of test were conducted: the test for the statistical significance of each estimator (t-test) and similarly the test of the estimator's significance (F-test). The tests were conducted at 95% confidence interval. The tests showed that the influence of some explanatory variables was statistically significant while some were statistically insignificant. On the examination of algebraic signs of the parameter estimates, the signs of the coefficients of most of the explanatory variables did not conform to the expected signs. Given that the specification and interpretation of the coefficients were correct, future researchers were then urged to investigate further on the probable causes of the wrong signs.

Still on the analysis, the test of multi-collinearity and auto-correlation revealed that the estimated equations were free of serious auto correlation and that multi-collinearity was not a problem. In evaluating the working hypotheses, we saw that the empirical evidence or test results did support our first and second null hypothesis, and also the third alternative hypothesis. The base of this support was seen in the statistical test of significance, examination of algebraic signs of parameter estimates and low values of adjusted coefficient of multiple determinations of the estimated equations. Despite the fact that Economic theory should be complemented with empiricism, we noted that the interpretation of all econometric studies leaves much room for judgment and thus expected that the possible implications of the results of this study should be taken with caution. We therefore concluded that the Nigerian monetary and fiscal authorities should give greater priority to other policy instruments or measures than monetary tools to achieve balance of payments stability and as a test of economic theory, the results of the study tends to suggest to the inconclusiveness of the monetary approach to the theory of balance of payments adjustment mechanism.

In view of this, we recommend that future empirical studies should be formulated in general terms rather than oriented solely to the monetary approach, so that the validity of rival theories or approaches can be compared or assessed. At the same time, theoretical work must proceed in the direction of reconciling and merging the various approaches. In this connection, the present researcher intends to undertake further research along the applicability of the model of this study on other less developed countries especially the West African countries or sub-region; and also to use a model that is uniquely suited to

the current managed – floating system of exchange rates, where a payments imbalance is reflected in a combination of reserve changes and exchange-rate movements.

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