

# MACROECONOMIC IMPACT OF FISCAL DEFICITS IN NIGERIA (1970-2012)

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## **Abstract**

*Few issues in public finance of developing countries have generated so much debate on fiscal deficits. Critics have rejected the claims that any positive contribution have been made to the economy. But proponents of fiscal deficits had seen them as catalyst of economic growth and development. There are no enough empirical studies to show the negative and positive effects of fiscal deficits on the Nigerian economy. The objective of this study is to investigate the impact of fiscal deficit on macroeconomic variables in Nigeria. This study has investigated the macroeconomic impact of fiscal deficits in Nigeria for a period of thirty-nine years. The study made use of two-stage least squared method. Four sectors block were estimated using 2SLS namely external sector, public sector, monetary sector and real sector block. The empirical results of the model showed that all the equations of the models have good fit as indicated by the adjusted  $R^2$  whose values ranged between 49% and 94%. The estimates of demand for money indicate that fiscal deficit is positively influenced to real demand for money. There is also an indication that fiscal deficits influenced real income, inflation and prices is statistically significant in explaining what is happening to them. From the estimation equations, in public sector block, the results have good fit as adjusted  $R^2$  ranged between 51% and 90%. The results show that fiscal deficits have positive impact on inflation, positive impact on unemployment, export, import and gross domestic product. The results also show that fiscal deficits and money supply are positively related to exchange rate. From the simulation experiments, a ten percent increase in fiscal deficits caused appreciable increase in demand for money balances, price level, real income, import, gross domestic product, exchange rate, inflation, agricultural output, manufacturing and oil and gas. Other variables in the model have shown positive but relatively minor increases. Demand for money balances, price level, real income, monetary policy rate and other macroeconomic variables in the model showed marginal increase ranging from 0.0002% to 0.15%. Overall, the effects of decrease in fiscal deficits on the economy were relatively low for expansion in domestic credit which created excessive supply of money over demand and therefore led to foreign reserve outflow. It is therefore concluded that fiscal deficits have significant impact in Nigeria. The study therefore recommends among others the followings: Government should adopt appropriate exchange rate policies to ensure that even when these deficits are being paid for, the exchange rate for our domestic currency will not be affected. In order to curtail deficits, public spending growth rate must be reduced. The government spending should be more in the productive sectors of the economy such as the industrial and agricultural sectors of the economy. There should be reduction in fiscal deficit, which will help to improve balance of payments deficit. Government should aim at fiscal balance to achieve macroeconomic*

*stability and there is a need for budget restructuring and non-oil revenue must increase substantially. There should be improved revenue collection to reduce government borrowing and the negative effects on the economy. Fiscal and monetary policies must be properly coordinated or harmonized in Nigeria to achieve improved macroeconomic outcomes.*

## **1.0 INTRODUCTION**

There were few studies in the area of public sector economics that have empirically examined the impact of fiscal deficits. There is no general agreement in the literature in respect of the effects of fiscal deficits in the economy. Keynes argued that fiscal deficits have positive effects. Other economists e.g. the neoclassical economists argued that fiscal deficits have negative effects. For the past two decades Nigeria has witnessed macroeconomic instability.

A major problem which has hindered the attainment of macroeconomic stability and sustainable growth in Nigeria has been attributed to fiscal deficit and the reliance of government on borrowing particularly from the banking system. Borrowing from the Central Bank of Nigeria (CBN), to finance fiscal deficits amounts to printing high powered money which results in excess liquidity in the financial system, depreciation of the Naira and inflationary pressures in the goods and services markets as well as the crowding out of the private sectors by the government from the credit market. All these tend to have serious adverse implications for the growth of gross domestic output (GDP) (Ariyo and Raheem 2001, Anyanwu, 1997). Therefore, such a development needs to be investigated.

The poor performance of the Nigerian economy has continued unabated. The slow growth of the economy is mirrored in the sluggish growth in the key sectors of the economy. The growth rates of the agricultural and industrial sectors have remained unsatisfactory.

There has been persistent economic crisis in Nigeria, with the attendant problems of high inflationary rate, exchange rate distortions, huge public indebtedness and the debt crisis, adverse balance of payments and high unemployment, to mention a few. These challenges can be attributed to reckless and poor management of public expenditure which could have arisen from persistent fiscal deficits (Nyong and Odubekun, 2002). Nobody is happy with the country's behavior of most aggregative variables such as the level of output, general price level, the unemployment rate, and the balance of payments situation. The Nigerian economy has continued to experience various phases of business cycle, from depression to recovery and recession. Economic stability and satisfactory growth have been elusive. The result is that Nigeria has not been able to maximize the benefits of God-given resources. The gap between expenditure and revenue has been increasing in recent years. This, among other things, could have resulted from lack of good governance, transparency and accountability in the use of public resources as well as poor revenue performance which are not the focus of this paper.

Due to expansionary fiscal policy of government, expenditure has been rising faster than revenue. For example, deficits grew from an average of 5.0 percent of GDP in 1983-86 to 10.3 percent in 1991-94 before declining to 4.9 percent in 1999-2002 (CBN, 2003). The stock of government debt rises as annual fiscal deficits accumulate. For many years, government fiscal operations have been linked to money supply through the financing of budget deficits with adverse consequences.

Since 1970, fiscal deficits have been an important macroeconomic problem but from the mid 1980s specifically with the introduction of the Structural Adjustment Programme in 1986 the problems have become worse. According to Oyejide (1972), a prudent and sustainable fiscal posture promotes non-inflationary economic growth. In the long run, low and stable levels of fiscal deficits and government debts are indicators of prudent fiscal policy since they are associated with higher rates of economic growth. But in Nigeria, it has been impossible to achieve fiscal surplus. Besides, persistent conflicts have arisen between the CBN whose primary duty is to maintain price stability and the federal government which wants to achieve economic growth by running a stream of large fiscal deficits. Another disturbing variable in Nigeria's development mix is the high debt overhang. It has resulted from fiscal deficit.

The objective of this paper is to investigate the impact of fiscal deficits on macroeconomic variables in Nigeria.

The paper is divided into five sections. Section one is the introduction. Section two deals with review of relevant literature while section three is the methodology. Section four deals with discussion of findings while section five is about conclusion and recommendations.

## **2.0 LITERATURE REVIEW**

### **Fiscal Deficits**

Fiscal deficits connote the difference between the budget receipts and budget expenditures financed by withdrawal of cash balances and borrowing from the public Nwogugu, (2005). Fiscal deficits also refer to the excess of the public sector's spending over its revenue.

### **Macroeconomic Variables**

Macroeconomic variables are the macroeconomic aggregates that provide information about the performance of an economy in terms of growth, functional distribution of income, external sector exposure, economic shock vulnerability as well as the direction of the economy. These macroeconomic aggregates include gross domestic product, unemployment, monetary policy rate, interest rate, money supply, inflation, exchange rate and current account balance.

### **Planned fiscal deficit**

It is generally defined in terms of loan financing and drawing down of cash balances Nwogugu (2005). It connotes the difference between the budget receipts and budget expenditures financed by withdrawal of cash balances and borrowing from the public. Planned fiscal deficit simply refers to the excess of the public sector's spending over its revenue that has been arranged by the

government due to the economic policy of the state, (World Bank 1988). According to Jhingan (2002) the phrase deficit financing is used to mean any public expenditure that is in excess of current revenues. In advanced countries, deficit financing is used to describe the financing of a deliberately created gap between public revenue and public expenditure or a budgetary deficit. The term deficit financing is used to denote the direct addition to gross national expenditure through budget deficits whether the deficits are on the revenue or capital account. The essence of such a policy lies in the government spending in excess of revenue it receives in the form of taxes, earnings of state enterprises, loans from the public deposits and funds and then miscellaneous sources.

### **Unplanned fiscal deficit**

Unplanned fiscal deficits are the excess of the public sector's spending over its revenue that is accomplished without advanced planning. It connotes the difference between the budget receipts and budget expenditures financed by withdrawal of cash balances and borrowing from the public not following or structured according to the overall plan of the economy. Fiscal deficit itself refers to the excess of the public sector's spending over its revenue (World Bank, 1988).

### **Actual fiscal deficit**

Actual fiscal deficits are the real and the existing excess of the public sector's spending over its revenue in an economy. It means the real differences between the budget receipts and budget expenditures financed by withdrawal of cash balances and borrowing from the public not following or structured according to the overall plan of the economy.

## **2.1 Theoretical Literature**

## **2.2 Theoretical Framework of the Study**

The theoretical framework of the study is derived from Keynes (1936). His theory postulated that there is a positive relationship between budget deficits and macroeconomic variables. He argued that usually budget deficits result in an increase in domestic production, increases aggregate demand, increases savings and private investment at any given level of interest rate. The Keynesian absorptive theory suggests that an increase in the budget deficits would induce domestic absorption and thus, import expansion, causing current account deficit. In the Mundell-Fleming framework, an increase in the budget deficit would induce an upward pressure on interest rate, causing capital inflows and an appreciation of the exchange rate that will increase the current balance.

Keynes recognized that an economy could converge to a stable equilibrium, which may be undesirable, since it might involve some involuntary unemployment. Thus, in the Keynesian model, only government has the will and means through fiscal policy to move the economy towards a stable and desirable equilibrium by the regulation of its revenues and expenditures. In other words, at every point in time, the government can control its spending and revenue to achieve a fiscal balance that is considered optimal balance for wider societal goals (Keynes 1936).

In applying fiscal policy as an instrument to achieve certain economic ends, three types of budgeting, namely balanced budget, deficit budget and surplus budget are considered. A budget deficit or surplus involves stock/flow changes in net claims held by the central Bank and the private sector on government. Thus:

$$G - T = \Delta(GC) + \Delta(GB) + \Delta(GP) \text{ -----1}$$

Where

G = government expenditure on goods and services and transfer payments

T = tax revenue

$\Delta GC$  = changes in Central Bank claims on the government

$\Delta GB$  = changes in commercial bank holding of government securities

$\Delta GP$  = changes in non-bank public holding of government securities

Thus, equation (1) can be expressed as:

$$G - T = GC + GB + GP \text{ -----2}$$

Equation 2.8 seems to ignore the role of external financing of government deficit. Thus, within the framework of national income accounting, government fiscal deficit gap (G-T) equals the savings gap (S-1), and external sector gap (m - x):

$$G - T = (S - 1) + (m - x) \text{ -----3}$$

$$\text{But } \Delta GC = \Delta(G - T) - K \text{ -----4}$$

$$\Delta(G - T) = \Delta GC + K \text{ -----5}$$

Equation (2.9) can then be expressed as:

$$G - T = GC + GB + GP + K \text{ -----6}$$

Where K = capital inflows through loans, grants, etc, including inflows through sale of government securities.

The different sources of financing government deficits in equation (6) has been consolidated into one by lumping together the Central Bank holdings of claims on the government and claims on the private sector and the non-bank public (i.e. the total domestic credit to the government (DCG). The government must then operate under an effective budget constraint within the above dispensation. Thus, any change in government expenditures must be financed by a change in tax revenue, government debt, or the monetary base.

With a fiscal deficits financed by money creation, the money supply expands either directly if the borrowing is from the Central Bank or indirectly if it is through the deposit money banks. The further increased expenditure associated with rising inflation compel the Central Bank to increase the issuance of money thus further generating more seigniorage (Oluranti 1999).

Domestic finance of fiscal deficits could also be done through the sale of government bonds to the public or the banking system. The sale of bonds to the public could lead to an excess supply of bonds especially in an economy where the financial structure is underdeveloped (as in Nigeria) and capital market highly fragmented. That is, the effectiveness of fiscal deficits financing through the sale of bonds to the public will depend on the size and sophistication of the country's capital market and interest rate policy being followed.

Government can also borrow from abroad to finance fiscal deficit. This could be in the form of direct borrowing from abroad by the treasury or by public enterprises as well as concessionary Loans and foreign grants. If a country can finance its deficit through this source, the deficits may not have adverse effects on the economy, provided that the deficit is associated with productive use of resources. According to Oluranti (1999) more often than not the experiences of developing countries have, however, been dismal. The foreign loans are rarely used to finance productive ventures and because of this, most of them are sunk in the debt quagmire.

### **2.3 Empirical Literature**

Dwyer (1982) studied the relationship between budget deficits and macroeconomic performance of US using Vector Autoregressive Model (VAR) for the period 1952-1978. He found no evidence that larger government deficits increase prices, spending, interest rates, or the money stock. (Kelly 1997) studied the relationship between budget deficits and macroeconomic variables in a cross-sectional study involving 32 countries for the period 1950-1980, using OLS and GLS. He found that deficits did not lead to inflation, but negatively correlated with the rate of growth of real output and increased deficits appear to retard investment. AL-Khedir (1996) studied the relationship between budget deficits and macroeconomic performance of the G-7 countries for the period 1964-1993 using VAR. He found out that budget deficits led to higher short-term interest rates in the 7 countries, but the deficits did not manifest any impact on the long-term interest rates.

Guess and Koford (1984) used the Granger Causality test to find the causal relationship between budget deficits and inflation, GNP and private investment using annual data for seventeen OECD countries for the period 1949-1981. They concluded that budget deficits did not cause changes in these variables.

Alisalman (2003) analyzed the impact of the budget deficit on key macroeconomic variables in the seven major industrial countries (G-7): Canada, France, Germany, Italy, Japan, the United Kingdom, and the United States. Four models were developed to test the impact of the budget deficit on the variables of importance within the economies of the countries in question. The first model tested the relationship between the budget deficit and the short-term interest rate. The second explored the impact of the budget deficit on the long-term interest rate. The third model examined the impact of the budget deficit on the trade balance. The fourth and final model was specified to explain the relationship between the budget deficit and economic growth. The data utilized in this study covered the period from 1964 to 1993 and were gathered mainly from the international statistics of the International Monetary Fund. The data were standardized in the form of the percentage of the gross domestic product and the percentage change over the previous year in order to compile similar data across the seven countries. Multiple regression analysis as well as meta analysis were used to analyze the data. The multiple regression results indicated that the budget deficit led to higher short-term interest rates in Japan and the United States. With respect to the long term-interest rate, the budget deficit led to an increase of this rate

in France, Germany, and the United States. The budget deficit, however, appeared to worsen the trade balance in Canada. In Italy and the U.S., the trade balance improved with the budget deficit. With respect to the economic growth, the budget deficit was significant variable of growth in France, Germany, and Italy. When the data for the seven countries were combined in Meta analysis, the results showed that the budget deficit led to higher short-term interest rates in the seven countries. The budget deficit, however, did not manifest any impact on the long-term interest rates. The trade balance was worsened by the budget deficit and the economic growth improved in all the seven major industrial countries.

Vuyyuri & Seshaiyah (2004) examined the interaction of budget deficit of India with other macroeconomic variables such as Nominal effective exchange rate, GDP, Consumer Price Index and money supply (M3) giving special emphasis on the budget deficit-exchange rate relationship using Cointegration approach and Variance Error Correction Models (VECM) for the period 1970-2002. The results reveal that the variables under study were cointegrated and there was a bi-directional causality between budget deficit and nominal effective exchange rates.

Andreas & Anastasios (2011) investigated the causal links between budget deficit (BD) and other macroeconomic variables such as Consumer Price Index (CPI), Gross Domestic Product (GDP) and Nominal Effective Exchange Rate (NEER) for Greece, during the period 1980-2009. Empirical evidence based on Variance Error Correction Model (VECM) and variance decomposition estimates indicate that the variables under study were cointegrated and that one-way causalities exist running from NEER to BD and from BD to GDP. These results imply that bidirectional causal links existed between NEER and CPI in the case of Greece while GDP granger-causes CPI. However, the authors found no significant links between budget deficit and inflation in the case of Greece. But, they highlighted the fact that NEER has a direct impact on Greece's budget deficit, which is in line with the majority of relevant academic works. So, the Greek government should closely monitor the impact of NEER on the budget deficit of Greece, especially under the severe macroeconomic pressure that the sovereign debt crisis causes on the Greek economy since 2009.

Chaudhary & Shabbir (2005) investigated the impact of government budget deficit on money supply, domestic price level, output, balance of payments and international reserves. The empirical evidences led to a conclusion that fiscal and monetary variables are important to determine economic stability in the foreign sector of Pakistan. Money supply was positively related to foreign reserves, bank credit and borrowing 'of the public sector to finance deficit. It was negatively related to interest rate. The money demand was also negatively related to interest rate but positively related to income. The output was positively related to credit extended to the private sector, international reserves and real expenditures of the public sector for the development of social sectors. The increase in money supply due to excessive credit, affected trade balance through output, which resultantly brought changes in foreign reserves. The increase in government budget deficit, financed through excessive expansion in domestic credit, created excessive supply of money over demand, and therefore, led to foreign reserve outflows. The

credit obtained by the public sector from the banking system and utilized for current expenditures led private credit to crowd out. The export supply function indicated that exports were positively related to real income, relative prices and nominal exchange rate. The elasticity of exports with respect to income was greater than one, which means an increase in income enhances exports more than the growth of income. The imports were also positively related to income, and foreign reserves, and negatively to relative prices of imports and foreign exchange rate. The monetary policy actions were heavily dependent on the fiscal deficits. Therefore, a close link between monetary and fiscal policies was established. In order to achieve the internal and external balance, the implication of monetary and fiscal policies must be consistent. According to Chaudhay and Shabbir (2005) to reduce the balance of payments deficit and to restore stability, the monetary authorities should control the excessive domestic credit expansion while they said only possible when government reduces the size of its budget deficit.

Keho (2010) used time-series data to investigate the casual relationship between budget deficit and economic growth in the member countries of the West African and Monetary union. He conducted Granger casualty test and produced mixed results. In three cases, he did not find any casualty between budget deficit and growth. In the remaining four countries, deficits had adverse effect on economic growth. (Bevan and Adam, 2001) examined the relationship between fiscal deficits and growth for a group of 45 developing countries. They found evidence of a threshold effect at a level of the deficit around 1.5 % of Gross Domestic Product (GDP). However, there appeared to be a growth payoff to reducing deficits to this level, this effect disappeared or reversed itself for further fiscal contraction.

As Ball and Mankiw (1995) observed that, running public fiscal deficits typically reduced national savings, and lower national savings, in turn, led to reduced investment and reduced net exports. Investment was curtailed because a drop in national savings restricted the supply of loanable funds.

Murty and Soumya (2007) found that deficit financing provided stimulus to economic growth by financing investment, employment and output in the economy. When government resorted to deficit financing for development, large sums were invested in basic heavy industries with long gestation period and economic and social over heads. This led to immediate rise in monetary incomes while production of consumption goods could not be increased immediately with the results that prices went up. However, it helped rapid capital formation for economic growth and development.

Kumar and Soumya (2010) investigated the relationship between GDP growth and fiscal deficits taken as percentage of GDP using a simple regression equation. The result yielded a negative correlation, though a weak one. However, the long run relationship between fiscal deficit and GDP, using the logarithm of both to avoid non-stationary problem, was surprisingly a positive one.



According to Fischer and Easterly (1990) examining the financing of deficit brings to light the different kinds of macroeconomic imbalances the deficit can cause. As a first approximation, printing money excessively causes inflation, excessive use of foreign reserves leads to crises in the balance of payments, high foreign borrowing leads to a debt crisis and too much domestic borrowing leads to high real interest rates and crowding out of private investment with negative effect on economic growth. According to Debt Management Office (2003), persistent deficits adversely impact on interest rates, investment and growth within an economy: It contributed to inflation and crowded out private investment.

Kustepeli, et al (2004) found that fiscal deficit alters the incentive mechanisms in the economy. As the conceptions and expectations of the economic agents differ due to deficits, markets were faced with speculation and arbitrage possibilities which affected the working of the financial markets adversely. In addition, budget deficits may force economic policy makers to choose monetization. Which makes the conduct of a sound monetary policy extremely difficult, if not impossible, consequently the problem of coordination of fiscal and monetary policies emerges, Ozatay (1997). Budget deficits have led to instability in the economy through the expectations about how the deficits would be financed. If the private sector expects the government to monetize the deficit and therefore lead to inflation, the expectations could lead to inflation even when the authorities do not monetize the deficit. Then the real sector will suffer from the crowding-effect of budget deficits, leading to reduced output growth. This will put prices up, resulting in inflation.

Easterly (1990) also found that fiscal deficits received much of the blame for the assorted economic ills that beset developing countries in the 1980's over indebtedness and the debt crisis, high inflation and poor investment performance. Their attempts to regain macroeconomic stability through fiscal adjustment which achieved little success, raised questions about the macroeconomic consequences of public deficits and fiscal stabilization in developing countries.

Guess and Koford (1984) used the Granger causality test to find the causal relationship between budget deficits and inflation, GNP, and private investment using annual data for seventeen OECD countries for the period 1949 to 1981. They found that budget deficits did not cause changes in these variables.

Bahmani (1999) investigated the long run relationship between U.S Federal real budget deficits and real fixed investment using quarterly data from 1947 to 1992. The empirical results indicated that real budget deficits crowded in real investment, supporting the Keynesians who argue for the expansionary effects of budget deficits, by raising the level of domestic economic activity, crowd-in private investment.

Onwioduokit (1995) investigated the causal relationship between inflation and fiscal deficit in Nigeria from 1970 to 1994. He found that although fiscal deficits caused inflation, there was no feedback between inflation and fiscal deficit. The Structural model of inflation revealed that, it

took about two years for the fiscal deficit to impact on inflation in Nigeria. He concluded the study by adding that what should be of paramount concern to policy makers as regards inflation should not so much be the level of fiscal deficits but the sources of its financing as well as the absorptive capacity of the economy. Thus, policies to tame inflation should have inbuilt ability to increase the productive capacity of the economy.

Nyong and Odubekan (2002) using ordinary least squares estimation procedure, showed that monetary financing of deficits led to an increase in the money supply which increased inflation rates. The increase in inflation rate generated instability in the macro economy and hence poor economic growth due to the negative signal it sent to the investors and savers. They found that an increase in monetary financing of the deficit by 10% led to an increase in inflation by 5% and gave rise to 0.0072% fall in economic growth.

The study conducted by Olowononi (2006) showed that fiscal deficits had negative impacts on some macroeconomic variables. He showed that fiscal deficits had increasingly caused inflation in Nigeria. The fiscal deficits were negatively related to unemployment, meaning that the results confirmed the prescription of economic theory that rising fiscal deficits leads to reduced unemployment. He also discovered that there was a negative relationship between fiscal deficits and gross capital formation and private investment in Nigeria.

Nyong and Odubekun (2002) found that fiscal deficits created a shortfall in private capital formation by reducing the pool of saving available for private sector borrowers, thus crowding out private capital formation. To the extent that deficits are not used for investment purposes, total capital formation is reduced. On the account of lack of sufficient resources to finance public investment, governments have to resort deficit financing.

The study of fiscal deficit and inflation by Ndebbio (2000) was informed by the fact that the two problems have had serious adverse implications for the Nigerian economy. This is because the continued instability in the economy could be divorced from these intractable problems. Driven by the existence of instability in the economy and the need to reverse it his study aimed at investigating the inter-linkages among fiscal deficit (FD), money supply (MS) and inflation (IF). This was done by incorporating the feedback mechanism from inflation to fiscal deficit for an open economy like that of Nigeria.

Having established through Granger causality (G-C) test that the relationship between FD and IF in Nigeria was no longer a unidirectional causality issue, but a two-way causation track in which FD and IF simultaneously cause each other, the basis for a structurally biased model was established. He used econometric techniques and five structurally designed equations were developed, namely price, government expenditure, government revenue, expected inflation and import equations. These structurally designed equations with feedback mechanisms were estimated using systems estimation procedure.

For policy direction, simulation experiments using different scenarios were performed. For

example, in scenario 1, the model was disturbed (shocked) by 10% increase of expansionary monetary policy), and these was a substantial increase in government revenue and imports. A decrease in MS by 10% (a case of contractionary monetary policy) led to a decrease in most of the endogenous variables under study.

Njiforti and Mohammed (2010) found that deficit financing in Nigeria had crowded out private savings and investments and due to its inability to influence savings deposit rate upward, savings have not been influenced (instead, it reduces private savings) and therefore the negative effect of deficit operations fell on private investment. Private disposable income was found significant in determining private savings instead of deficit and interest rate as argued on the theoretical basis; and in relation to private investment, lending interest rate and deficit were major determinants. The message transmitted from their finding is that domestic financing of deficit in Nigeria has been detrimental to private sector to effectively participate and take its position within the growth and development policy matrix.

According to Oyejide (2003) a substantial body of academic discourse was developed around issues relating to the pattern of fiscal behavior in Nigeria and some of its consequences. He gave a brief review of the literature that offers a glimpse into the questions that have attracted the attention of researchers for many years. For instance, Oyejide (1972), and Ndebbio (1998), were concerned not only with an examination of the pattern of budget deficits over different periods, but also with the effects of these deficits on domestic liquidity and inflation.

The contradictory findings from several studies, as noted above, suggest that empirical research, on the average, has had little success in establishing a strong and statistically significant connection between fiscal deficits and inflation across a broad range of countries and inflation spectrum. This perspective was buttressed by Piossers (1991) comprehensive analysis of the determinants of seigniorage in the United States and twelve (12) other countries, using both single equation OLS regressions and VARs, which found no significant causality between fiscal deficits, change in base money and inflation. Also, Kevin and Tullock (1997) found a weak connection between seigniorage and budget deficits except during very high inflation episodes. Using OLS estimates of the determinants of seigniorage in a cross section of 78 (mostly developing) countries, Ranjan and Sharma (2008) reached the conclusion that fiscal variables play no significant role in inflationary trend. However, using a more restricted sample of high inflation developing countries, Dornbusch, and Fischer (2004) found evidence which suggests that fiscal deficits tend to accommodate, rather than drive, inflation. The authors attribute this mainly to a combination of exchange rate shock and inflationary inertia. The theoretical models showing the relationship between fiscal policy and private consumption depends largely on whether Ricardian equivalence is true. This equivalence theorem states that for a given path of government expenditures, the timing of taxes should not affect the consumption decision made by individuals paying the taxes. The simple idea behind the theorem is that rational agents realize that substituting taxes today for taxes plus interest tomorrow via government debt financing is the same (Barro, 1991). Therefore, the financing of government spending via debt or taxes

should not affect the current account. Economic reasoning for connection between budget deficit and current account balance has been traced from the national income identity.  $Y = C + I + G + (X - M)$

Where  $Y$  is national income,  $C$  is private consumption,  $I$  is real investment spending in the economy such as spending on building, plant, and equipment,  $G$  is government expenditure on final goods and services,  $X$  is exports of goods and services, and  $M$  is imports of goods and services. The current account (CA) was defined as:  $CA = (X - M) + F$

Where  $F$  stands for net income and transfer flows. So, in addition to goods and services balance, the current account includes also net income received from or paid abroad. For simplicity, here we assume that net income from abroad is not large items in the current account. Although it is worth mentioning that if country has big foreign debt and high debt servicing payments, its income paid abroad should be a large negative item. The current account shows the size and direction of international borrowing. When a country imports are more than exports, it has a deficit in CA, which is financed by borrowing from foreigners. Such borrowing may be done by the government or by the private sector. Private firms may borrow by selling equity, land or physical assets. So, a country with current account deficit must be increasing its net foreign debt (or running down its net foreign wealth) by the amount of the deficit. A country with a deficit in CA is importing present consumption and/or investment (if investment goods are imported) and exporting future consumption and/or investment spending (Ahuja 2010)

Macroeconomic theory suggests that fiscal deficits cause inflation (D'silva and Bhuptani 2011). The theory argues that fiscally dominant governments running persistent deficits have the proclivity to seigniorage to finance the deficits, which consequentially or ultimately cause inflation (Sargent and Wallace, 1981). However, as they posited, empirical research had limited success in establishing this relationship. While economic theory does not rule out the importance of other mechanisms that potentially fuel inflation, fiscal imbalances remained central to most models.

### **3.0 Macroeconomic Model of the Study**

In order to analyze the macroeconomic effect of fiscal deficits in Nigeria, a macro-economic model was specified. The building blocks capture major macroeconomic variables and also the impact transmission of fiscal deficits on the Nigeria economy. The empirical model equations were specified.

Specifically, the macroeconomic model which captured the relationship between fiscal deficits and key macroeconomic variables comprised of four blocks – external sector block, public finance block, monetary sector block and real sector block.

#### **3.1 External Sector Block**

To analyze the impact of fiscal deficit on the macroeconomic variables such as balance of payments, fiscal and monetary variable linked to observe the process and their role in the Nigerian economy. The Quantity Theory of Money implies that when money supply expands more rapidly than real output, it creates inflation. However, there are structural variables, which also generate this problem in Nigeria.

De Silva (1977) developed a simultaneous equation model and estimated the key equations separately with OLS method. In Pakistan, Chaudhary and Ahmed (1995, 1996) also estimated this model with the same estimation method as De Silva. Because OLS method gives biased results for simultaneous equation model; the estimates of these studies are not reliable. Besides, the above studies also used a very small sample size to explain short run impacts. So our study is undertaken to improve upon the shortcoming in the literature and provide reliable results. First, structural variables are incorporated in the model; second, 2SLS method is utilized for estimation.

In addition, we have extended the model by incorporating the exports and imports equations in order to include external sector for the Nigerian economy. The objective of this exercise is to investigate the mechanism through which the monetary impulses are channeled and then their affects are transmitted to other macroeconomic variables, *i.e.* domestic price level, output, level of exports and imports and balance of payments.

The money supply identity is given as follows.

$$M_s = M_d \dots\dots\dots 3.1$$

Where  $M_s$  is the money supply and  $M_d$  is the demand for real money balances is the function of real income and interest rate, exchange rate and inflation.

$$(M_d / P) = f(y, ir, ER, INF) \dots\dots\dots 3.2$$

Where  $M_d$  is the demand for nominal cash balances;  $P$  is the domestic price level;  $y$  = real income,  $(ir)$  is the rate of interest,  $(ER)$  is the exchange rate and  $(INF)$  is the inflation rate. The price level is determined by the monetary equilibrium that varies with the changes in money supply and demand for real money balances. If  $\Delta M_s > \Delta M_d$ ,  $P$  will rise, if  $\Delta M_d > \Delta M_s$ ,  $P$  will fall and if  $\Delta M_s = \Delta M_d$ , there will be no change in price level.

The real output depends on real total government expenditures, total government consumption and total government investment, credit of banking system to the private sector, balance of trade and real interest rate.

$$y = f(GE, BT, ir) \dots\dots\dots 3.3$$

Where  $^{GE}$  is the real total government expenditure (government, investment plus government consumption),  $^{(BCP)}$  is the credit of banking system to the private sector,  $^{BT}$  is the balance of trade (export minus import),  $^{ir}$  is real interest rate. The supply of real exports depends on real income, relative prices of exports and nominal exchange rate.

$$x = f(y, RP_x, ER) \dots\dots\dots 3.4$$

Where  $y$  is the level of real income,  $^{RP_x}$  is the relative prices of exports ( $^{p_x / p}$ ), and  $^{ER}$  is the nominal exchange rate.

Finally the demand for real imports  $^{(m)}$  depends on real income, relative prices of imports, international reserves and nominal exchange rate. That is

$$m = f(y, RP_m, IR, ER) \dots\dots\dots 3.5$$

Where  $^{RP_m}$  is the relative prices of import and  $^{IR}$  are the international reserves and  $^{ER}$  is the exchange rate. The trade balance and foreign exchange reserve (balance of payments) equations are defined as:

$$BT = x - m \dots\dots\dots 3.6$$

$$R = R(-1) + BT + Bf \dots\dots\dots 3.7$$

Where  $BT$  is the balance of trade and  $Bf$  is the net foreign borrowing.

The complete model in log form can be written as:

$$\ln(Md / p) = b_0 + b_1 \ln(y) + b_2 \ln(i) + b_3 \ln(ER) + b_4 \ln(INF) \dots\dots\dots 3.8$$

$$\ln(p) = a_0 + a_1 \ln(GE) + b_2 \ln(M2) \dots\dots\dots 3.9$$

$$\ln(y) = c_0 + c_1 \ln(GE) + c_2 \ln(BCP) + c_3 \ln(BT) + c_4 \ln(ir) \dots\dots\dots 3.10$$

$$\ln(x) = d_0 + d_1 \ln(y) + d_2 \ln(RP_x) + d_3 \ln(ER) \dots\dots\dots 3.11$$

$$\ln(m) = e_0 + e_1 \ln(y) + e_2 \ln(RP_m) + e_3 \ln(R) + e_4 \ln(ER) \dots\dots\dots 3.12$$

$$BT = x - m \dots\dots\dots 3.13$$

$$R = R(-1) + BT + Bf \dots\dots\dots 3.14$$

Endogenous variables are:  $M2, Md, p, y, m$ , and  $x$ .

Exogenous variables are:  $GBB, BCP, GE, RP_x, RP_m, ER, Bf$  and  $i$ .

The working of the model is as follows: The increase in money supply  $^{(Ms)}$  takes place due to, say, an increase in government borrowing from the banking system to finance the budget deficit  $^{(GBB)}$ . When the government spends this borrowed money there is increase in government expenditure which increases output  $y$  (Equation 3.16) that in turn raises the public's demand for, real money balances (Equation 3.12). Other things remaining the same, the change in domestic price level depends on change in money supply and money demand, if  $\Delta Ms > \Delta Md, \Delta P > 0$ , if

$\Delta Md > \Delta Ms$ ,  $\Delta P < 0$  and  $\Delta Ms = \Delta Md$ ,  $\Delta P = 0$ . Other things remaining constant, the change in price affects the supply of exports and demand for imports through relative prices of exports and imports (Equations 3.11 and 3.12). Changes in exports <sup>(x)</sup> and imports <sup>(m)</sup> affect the balance of trade thus resulting in changes in reserves <sup>(R)</sup> due to changes in balance of trade (Equation 3.14). The fiscal deficit-macroeconomic model for the external sector block is therefore specified as follows:

**Model Specification 1**

$$Md = a_0 + a_1FD_t + a_2y_t + a_3ir_t + a_4ER_t + a_5INF_t + Ut \dots\dots\dots 3.15$$

$$p = \beta_0 + \beta_1FD_t + \beta_2GE_t + \beta_3M2 + Ut \dots\dots\dots 3.16$$

$$y = \delta_0 + \delta_1FD_t + \delta_2BCP_t + \delta_3BT_t + \delta_4GE_t + \delta_3irt + Ut \dots\dots\dots 3.17$$

$$x = \Omega_0 + \Omega_1FD_t + \Omega_2y_t + \Omega_3RPx_t + \Omega_4ER_t + Ut \dots\dots\dots 3.18$$

$$m = \varphi_0 + \varphi_1FD_t + \varphi_2y_t + \varphi_3R_t + \varphi_4ER_t + \varphi_4Rpm_t + Ut \dots\dots\dots 3.19$$

Where

FD=Fiscal deficits, Md= demand for nominal cash balances, y= real income, ER= exchange rate, inf= inflation rate, p= domestic price level, GE= total government expenditure, M2= broad money supply, BCP= credit of banking system to the private sector, BT= balance of trade, R= international reserves, ir= interest rate, RPx= relative price of export, Rpm= relative price of import, and Ut is the error term which captures the impact of the government economic reform programmes on the economy.

**3.2 Public Sector Block**

Under the fiscal approach to the balance of payments; the current account balance is defined as the difference between monetary value of the domestic production and the aggregate demand (absorption). Hence, budget balance, is defined as the gap between government revenues and expenditures. The above definition can be simplified from the national income identity, as:

$$Y = C + I + G + (X - M) \dots\dots\dots 3.20$$

Where Y represents GDP, C is private consumption, I stand for private investment, G is government consumption, and X and M stand for exports and imports respectively.

Assuming the aggregate demand  $A = C + I + G$  then equation (3.20) can be rewritten as follows:

$$Y - A = X - M \dots\dots\dots 3.21$$

Equation (3.21) reflects the behaviour of the external account of the economy. The direct interpretation is that, external imbalances always trigger a series of developments in the economy, which in this case is budget deficit. However, any attempt to restore the balance must include effort to align revenue with expenditure. In order to introduce the disposable income, we introduced tax and international reserve (the latter was introduced basically on the assumption of

the fixed exchange rate regime) into the national income identity. It follows that equation (3.21) becomes:

$$Y + R - T = C + I + (G - T) + (R + X - M) \dots\dots\dots 3.22$$

It is to be noted that, S (savings) is the disposable income minus private consumption. That is:

$S = Y + R - T - C$ , the private absorption is illustrated by  $(C + I)$ ,  $(G - T)$  is for budget deficit, while the current account balance CAB is represented by  $(R + X - M)$ , R represents international transfer receipts and T stands for taxes. Substituting S and CAB by their respective components, we get:

$$(S - I) + (T - G) = (R + X - M) \dots\dots\dots 3.23$$

It is often argued that deficit in the current account occurs when aggregate investment outweighs aggregate savings. This is because within the framework of national income accounting, government fiscal deficit gap  $(G-T)$  equals the savings gap  $(S-I)$  and the external sector gap  $(M-x)$ . However, if investments equals' savings and government expenditure is greater than its revenue, the current account deficit is inevitable. The literature on the current account is quite explicit on this when it indicates the degree at which the domestic economy interacts with its external assets. Thus,  $(X + R - M)$  is also equivalent to the increase in net official assets plus the rate of capital outflow that is  $\Delta NFA$ . Hence,

$$CA + \Delta NFA \dots\dots\dots 3.24$$

The links between net savings of the private sector and the public sector deficit is easily appreciated through the following equation.

$$(S - I) + (T - G) = \Delta NFA \dots\dots\dots 3.25$$

The direct interpretation of equation 3.25 assuming  $S = I$  is that, (i) a budget deficit will be financed through a reduction in external net claims, which can be done through increase in external public debt or reduction of international reserves in the case of fixed exchange regime. (ii) Budget deficit could also be financed domestically, and this is through increase in government debt held by private economic agents. The relationship in the banking system provides a clear understanding on how the domestic borrowing is used to finance budget deficit and the balance sheet is given in equation 3.26 as follows:

$$\Delta NFA_b = \Delta M2 - (\Delta DC_g + \Delta DC_{nb}) \dots\dots\dots 3.26$$

The liability of the banking system is represented by  $M^2$  that is the broad money,  $\Delta DC_g$  is domestic credit of the banking system to the government and  $\Delta DC_{nb}$  is the credit of non-banking sector (private sector) to the government. Equation (3.26) is the difference between money expansion and credit expansion and, it works as follows. An increase in money relative to credit expansion will reflect as an increase in the net foreign asset. In countries where the capital markets are not advanced (such as Nigeria), budget deficit is usually financed through domestic and external borrowing. This expression can be simplified as follows:

$$G - T = \Delta DC_g - \Delta NFA_g \dots\dots\dots 3.27$$



Substituting (3.27) into (3.26), gives the relationship between the financing of the budget deficit and the banking system thus:

$$G - T = \Delta M2 - \Delta DCnb - (\Delta NFAb + NFAg) \dots\dots\dots 3.28$$

Equation (3.28) illustrates the sources through which government deficit can be financed. First, by an increase in money <sup>( $\Delta M2$ )</sup>; second, borrowing from non-banking sector; and lastly, by a reduction in international reserve and through external borrowing. In all, increased budget deficit will translate into increased current account deficit and then precipitate new external borrowing. However, all the three means of financing may lead to appreciation of real and nominal exchange rate in the case of flexible exchange rate and capital mobility. The specification of this model mirrors the works of Romer (1993), Akcay, Alper and Ozmucur (1996), Catão and Terrones (2003), Magbabeola and Adelokun (2003), Perrotti (2004) and Lane (1995). The fiscal deficit-macroeconomic model is therefore specified as follows:

**Model Specification 2**

$$INF = a_0 + a_1 FD_t + a_2 UE_t + a_3 MPR_t + a_4 MS_t + a_5 CAB_t + U_t \dots\dots\dots 3.29$$

$$UE = \beta_0 + \beta_1 FD_t + \beta_2 MPR_t + \beta_3 MS_t + \beta_4 CAB_t + U_t \dots\dots\dots 3.30$$

$$ER = \delta_0 + \delta_1 FD_t + \delta_2 MS_t + \delta_3 UE_t + \delta_4 MPR_t + U_t \dots\dots\dots 3.31$$

$$MPR = \Omega_0 + \Upsilon_1 FD_t + \Omega_2 MS + \Omega_3 UE_t + \Omega_4 GDP_t + U_t \dots\dots\dots 3.32$$

$$GDP = \phi_0 + \phi_1 FD_t + \phi_2 INF + \phi_3 MS_t + \phi_4 CAB_t + U_t \dots\dots\dots 3.33$$

Where

(FD)=Fiscal deficits, GDP=Gross Domestic Product, UE=Unemployment, MPR=Monetary Policy Rate, IR=Interest rate, MS=Money Supply, INF=Inflation Rate, ER=Exchange Rate and

CAB=Current account balance.

U<sub>t</sub> is the error term which captures the impact of the government economic reform programmes on the economy. The inclusion of exchange rate stems from the works of Romer (1993) and Lane (1995). They argue that the benefits of an expansionary monetary policy tend to be small in an economy because (1) the weight of the domestic goods sector will be smaller implying that the impact of monetary expansion on domestic employment will reduce, and (ii) the currency depreciation resulting from the monetary expansion will raise domestic inflation more than in a closed economy.

**3.3 Monetary Sector Block**

Monetary Policy is the deliberate use of monetary instruments (direct and indirect) at the disposal of monetary authorities such as central bank in order to achieve macroeconomic stability. Macroeconomic stability refers to achievement of internal and external Balance. The Bank’s current monetary policy framework is monetary targeting with:

- i. Base (Reserve) money as operating target
- ii. Broad money supply <sup>(M2)</sup> as intermediate target

iii. Inflation as the ultimate or final target

Both the operating target and intermediate target are employed in determining the optimum level of money stock/liquidity consistent with the assumed level of expected output growth and inflation. This process starts with the design of a short-term monetary programme approved by MPC using the quantity theory of money the quantity theory of money is illustrated in an equation, as:

$$Mv = P\dot{Y} \dots\dots\dots 3.34$$

Where **M** = money stock / supply

**v** = velocity of money (the number of times a unit of currency changes hands)

**P** = Price of basket of goods transacted

**Y** = the size of basket of goods transacted in a given period.

**Assumptions:**

v and Y are constant, in the short term.

Quantity of money determined by outside forces; is the main influence of economic activity in a society. The economy is operating in full employment equilibrium, and, the optimum liquidity level and aggregate net credit to the domestic economy are computed using the CBN balance sheet and solving the following equation:

$$M2 = NDC + NFA + OAN \dots\dots\dots 3.35$$

Where

M2 = Broad Money Supply

NDC = Net Domestic Credit

NFA = Net Foreign Assets

OAN = Other Assets Net

$$\Delta M2 = \Delta NDC + \Delta NFA + \Delta OAN \dots\dots\dots 3.36$$

Decomposing NDC into public and private

$$\Delta NDC = \Delta NDCg + \Delta NDCp \dots\dots\dots 3.37$$

Where NDCg = Net Domestic Credit to the government sector, and NDCp = Net Domestic Credit to the private sector

$$\Delta M2 = \Delta NDCg + \Delta NDCp + \Delta OAN \dots\dots\dots 3.38$$

Under the monetary targeting framework in an indirect approach, the liquidity level that is consistent with macroeconomic objectives is determined using Base Money (BM) as the operating target, M2 as the intermediate target while inflation is the ultimate target.

Conventionally, Base Money is made up of currency with the non-bank public, (C) and reserves of DMBs, (R), while

$$R = CRR + OR \dots\dots\dots 3.39$$

where, CRR = cash reserve Requirement and OR = Other reserves

i.e. C + DMBs deposits at CBN

Under the monetary targeting framework in an indirect approach, the liquidity level that is consistent with macroeconomic objectives is determined using Base Money <sup>(BM)</sup> as the operating target, <sup>M2</sup> as the intermediate target while inflation is the ultimate target

Conventionally, Base Money is made up of currency with the non-bank public, <sup>(C)</sup> and reserves of DMBs, (R), while

$$R = CRR + OR \dots\dots\dots 3.40$$

where, CRR = cash reserve Requirement and OR = Other reserves

i.e. C + DMBs deposits at CBN

$$M2 = C + D \dots\dots\dots 3.41$$

$$BM = C + R \dots\dots\dots 3.42$$

$$M2 = 1 + c \dots\dots\dots 3.43$$

$$BM = c + r \dots\dots\dots 3.44$$

$$M2/BM = K = (1+c)/(c+r); 0 < r, c < 1 \dots\dots\dots 3.45$$

$$M2 = KBM = [(1+c)/(c+r)BM] \dots\dots\dots 3.46$$

Where:

k = multiplier, R = DMBs' Reserve with the Central Bank, C = Currency outside banks, c = currency/deposit ratio, r = reserve/deposit ratio

Monetary policy management in Nigeria has been focused on manipulating monetary variables to achieve macroeconomic stability and growth. Thus, monetary policy variables have influence on the rate saving, investment and output. The monetary part of the block contains a behavioral money demand and money supply equations. The money supply equation is endogenous to the model to capture the monetization of the deficit. The real exchange rate <sup>(EX)</sup>, defined as ratio of tradable to non-tradable goods prices is here given as the ratio of export price to the domestic price level. The demand for money and supply and the real exchange equations are also specified and hence they are determined endogenously.

### Model Specification 3

$$DM = a_0 + a_1 FD_t + a_2 OILP_t + a_3 GDP_t + a_4 CEXP_t + U_t \dots\dots\dots 3.47$$

$$MS = \beta_0 + \beta_1 FD_t + \beta_2 GDP_t + \beta_3 EX_t + \beta_4 FER_t + U_t \dots\dots\dots 3.48$$

$$EX = \delta_0 + \delta_1 FD_t + \delta_2 TT_t + \delta_3 OPNES_t + \delta_4 DPL_t + \delta_5 OG_t + U_t \dots\dots\dots 3.49$$

$$DPL = \Omega_0 + \Omega_1 FD_t + \Omega_2 MS + \Omega_3 EX_t + \Omega_4 OILP_t + \Omega_5 FCI_t + U_t \dots\dots\dots 3.50$$

Where <sup>(FD)</sup> is the Fiscal deficits, <sup>(GDP)</sup> is Gross Domestic Product, <sup>(DM)</sup> is demand for money, <sup>(OILP)</sup> is the oil price, <sup>(CEXP)</sup> is consumption expenditure, openness of the economy <sup>(OPNES)</sup> measured as the ratio of net export to <sup>GDP</sup>, <sup>(EX)</sup> is the exchange rate, <sup>(DPL)</sup> is domestic price level, while <sup>(OG)</sup> is oil and Gas. <sup>(FER)</sup> is the foreign exchange reserve, <sup>(TT)</sup> is terms of trade, <sup>(MS)</sup> is money supply and <sup>(FCI)</sup> foreign capital inflow. The parameters are with *a priori* that the entire variables are expected to have positive signs.

### 3.4 Real Sector Block

The real sector block was disaggregated into three sub-sectors, namely; Agriculture <sup>(GDPAGR)</sup>, manufacturing <sup>(GDPMNF)</sup>, and oil and gas <sup>(GDPOG)</sup>. This disaggregation is shown in equation 3.51

$$GDPTOTAL = GDPAGR + GDPMNF + GDPOG \dots\dots\dots 3.51$$

All the three sectors are treated as stochastic. The functions are specified as a response function. Hence, the quality of agricultural output, manufacturing output and oil and gas output in any given year are assumed to depend upon productive inputs including government consumption, <sup>(GC)</sup>, total foreign external reserve <sup>(FER)</sup>, export and import of raw materials <sup>(IMPRM, EXPRM)</sup>, <sup>(IMPC)</sup> is import of capital; <sup>(IMPMG)</sup> is import of manufacturing goods while <sup>(CU)</sup> is capital utilization. All the parameters are expected to have a positive sign influencing real sector <sup>(GDPAGR+ GDPMNF+ GDPOG)</sup>. We therefore specified the functional relationship as follows:

**Model Specification 4**

$$GDPAGR = a_0 + a_1 FD_t + a_2 GC_t + a_3 IMPMG_t + a_4 IMPC_t + U_t \dots\dots\dots 3.52$$

$$GDPMNF = \beta_0 + \beta_1 FD_t + \beta_2 IMPRM_t + \beta_3 IMPC_t + \beta_4 GDPAGR_t + \beta_5 GDPOG_t + U_t \dots\dots\dots 3.53$$

$$GDPOG = \delta_0 + \delta_1 FD_t + \delta_2 IMPRM_t + \delta_3 EXPRM_t + \delta_4 IMPC_t + \delta_5 GC_t + U_t \dots\dots\dots 3.54$$

**3.5 Methods of Estimation**

The study made use of Two-stage least square method. In order to overcome the correlation problem between the endogenous explanatory variable and the error term in the structural equation, Theil and others suggested the two-stage least-square technique. This estimation method has been widely used in empirical work.

The objective of the two-stage least squares technique is to make the explanatory variable uncorrelated with the error term, such that the direct application of classical least squares to structural equations will result in consistent estimates. In this case the possible multiple solutions for structural parameters derived from the reduced-form coefficients can be avoided. Therefore, all the equations are to be estimated using two-stage least square method.

**4.1 The results of estimation of the macroeconomic model**

This section presents the econometric results that conform to the macroeconomic models specified in session three. A simultaneous equation model was estimated to examine the impact of fiscal deficits on key macroeconomic variables. The results of 2SLS regression models which specified the behaviour of external sector, public sector, monetary sector and real sector block were estimated using the macroeconomic data for the period 1970-2009. The criteria used in the analysis comprised of goodness of fit as indicated by R-squared <sup>(R<sup>2</sup>)</sup> and adjusted R-squared, statistical significance, sign correctness and ability to track historical data.

**4.1.1 Presentation and Analysis of Results in the External Sector Block**

*Table 4.6: summary of estimated equations in external sector blocks*

--	--

$$Md = 54.275 + 1.01 FD + 0.85y - 0.63ir - 0.21ER + 0.93 INF$$

(43.23) (2.81) (4.22) (0.91) (1.97) (1.62)

$R^2 = 0.79$   $R^{-2} = 0.75$  DW = 1.93

..... 4.1

$$p = 725.46 + 0.42FD + 1.10GE + 0.21 M2$$

(52.5) (2.14) (1.96) (2.33)

$R^2 = 0.81$   $R^{-2} = 0.78$  DW = 1.78

..... 4.2

$$Y = 8452.10 + 84 FD + 0.32BCP + 0.73BT + 0.47GE - 0.84ir$$

(638.2) (3.96) (2.57) (5.18) (3.18) (1.99)

$R^2 = 0.61$   $R^{-2} = 0.58$  DW = 3.287

..... 4.3

$$x = 231.64 + 0.81 FD + 0.18 y + 0.35 RP_x - 0.23 ER$$

(36.12) (3.76) (2.02) (3.04) (2.84)

$R^2 = 0.94$   $R^{-2} = 0.91$  DW = 3.32

.....4.4

$$m = 76.84 + 0.53 FD + 0.28 y + 0.92 R - 0.71ER + 0.01RPM$$

(534.1) (8.72) (0.65) (4.21) (3.27) (2.04)

$R^2 = 0.53$   $R^{-2} = 0.49$  DW = 2.17

..... 4.5

Table 4.6 above contained the estimated results of equations 4.1 to 4.5 representing the external sector block. The results indicated high degree of association between the dependent variables and the explanatory variables respectively. The adjusted  $R^2$  revealed that the models explained between 94 percent and 49 percent of the variations in the dependent variables.

The estimates of demand for money balances  $^{(Md)}$  in equation 4.1 indicate that fiscal deficits  $^{(FD)}$  is positively related to demand for money balances  $^{(Md)}$  and is statistically significant as indicated by the t-statistics. This means that a percentage increase in fiscal deficits  $^{(FD)}$  would result in 1.01 percentage increase in demand for money balances  $^{(Md)}$ . Other variables in the equation such as real income  $^{(y)}$  and inflation rate  $^{(INF)}$  are positively related to demand for money balances  $^{(Md)}$  while interest rate  $^{(ir)}$  and exchange rate  $^{(ER)}$  are inversely related.

The estimates in equation 4.2 indicated that the fiscal deficit  $^{(FD)}$  is positively related to price level (p) and is significant in explaining what is happening to prices as indicated by the t-statistics. This means that one percent increase in fiscal deficits is expected to increase prices by 0.42 percent. In that same equation, government expenditure  $^{(GE)}$  and money supply  $^{(M2)}$  has positive impact on price level. They are also significant in explaining the variation in price level.

The estimates in equation 4.3 show that fiscal deficit <sup>(FD)</sup> is positively related to real income <sup>(y)</sup>. That is, an increase in fiscal deficits say by one percent would result in an increase in real income by 0.84 percent. T-statistics of 3.96 means the variable is significant in determining the variation in real income. Bank credit <sup>(BCP)</sup>, trade balance <sup>(BT)</sup>, government expenditure <sup>(GE)</sup> are positively related to real income <sup>(y)</sup>, as shown in table 4.6. A one percent increase in real income <sup>(y)</sup> are explained by an increase of <sup>(BCP)</sup>, <sup>(BT)</sup> and <sup>(GE)</sup> by the amount of 0.32%, 0.73% and 0.47%, respectively. The interest rate is negatively related to real income and is insignificant. The result of the real income equation, suggests that bank credit to private sector and government expenditures play a key role in determining the level of real income in the Nigerian's economy. The increase in bank credit to private sector will lead to rise in investment level, which enhances the productive capacity of the economy and employment opportunities.

The estimates of equation 4.4 indicate that the Nigerian's exports <sup>(x)</sup> are positively related to fiscal deficits, our variable of interest. Fiscal deficit is also statistically significant in explaining what is happening to the Nigerian export <sup>(x)</sup>. When there are rise in fiscal deficits by a percentage, the country export would expand by 0.81 percent. Real income <sup>(y)</sup> and relative prices of exports <sup>(RPx)</sup> have positive impact on Nigerian export while exchange rate <sup>(ER)</sup> is negative. The income elasticity of exports could be positive or negative depending on the elasticity of demand for exportable goods. If the domestic demand for exportable goods rises more (or less) than proportionate increase in income then the income coefficient could be negative (positive) and less (more) of the output will be exported. The positive sign of  $RPx$  indicates that as the export price rises relative to domestic price level, the production for exports becomes more profitable and hence, export will expand rapidly. The negative sign of exchange rate <sup>(ER)</sup> implies that a depreciation of currency has a negative impact on exports. One percent depreciation in exchange rate will lead to increase in exports by 0.23 percent.

The results in equation 4.5 show that Nigeria's imports are positively related to fiscal deficit <sup>(FD)</sup>, real income <sup>(y)</sup>, foreign exchange reserves <sup>(R)</sup>, and relative price of import <sup>(RPm)</sup> and negatively related to exchange rate <sup>(ER)</sup>. Increase in fiscal deficit has impact on import. The income elasticity of imports is well below the unity, indicating that the demand for imports rises less than proportionate increase in output. The coefficient of foreign reserves shows a positive relationship between imports and reserves. A one percent increase in reserves will lead to increase in imports by 0.92%. The estimated coefficient of exchange rate is negative and significant, implying that the depreciation of the domestic currency (devaluation) may not have a dampening impact on imports. The negative effect of devaluation on imports is, however, equal to 0.71. This implies that imports are largely influenced by exchange rate, *viz.* level of investment, the desire to maintain full capacity utilization, fluctuations in availability of food grains, availability of foreign aid and the stringency of commercial policies.

#### 4.1.2 Presentation and Analysis of Results in the Public Sector Block

*Table 4.7: summary of estimated equations in public sector blocks*

--

$$inf = 9.08 + 0.23FD - 0.43UE + 0.71MPR - 0.92MS + 2.42CAB$$

(764.67) (1.96) (1.09) (2.43) (2.86) (2.11)

$R^2=0.78$   $R^{-2}=0.74$  DW= 2.97

..... 4.6

$$ue = 132.92 + 0.82FD + 1.032MPR + 4.21MS + 0.26CAB$$

(0.35) (2.95) (0.345) (4.75) (0.78)

$R^2=0.756$   $R^{-2}=0.632$  DW= 3.12

..... 4.7

$$ex = 7.3245 + 0.74FD + 1.85MS - 0.17UE - 0.46MPR$$

(9.87) (2.01) (7.12) (1.98) (2.12)

$R^2=0.99$   $R^{-2}=0.90$  DW= 8.60

..... 4.8

$$mpr = 20.60 + 6.41FD - 0.51MS - 0.31INF + 1.75GDP$$

(23.9) (-0.86) (0.64) (-4.70) (1.32)

$R^2=0.76$   $R^{-2}=0.62$  DW= 8.46

.....4.9

$$gdp = 0.57 + 0.987FD + 0.567INF - 2.21MS + 0.42CAB$$

(5.97) (0.32) (-6.86) (9.76) (4.65)

$R^2=0.72$   $R^{-2}=0.60$  DW= 0.98

.....4.10

The results in the table above show the summary of effects of fiscal deficits in equations 4.6 to 4.10 which have good fit as the adjusted  $R^2$  ranged between 60% and 90%. This means that the models explained between 60% and 90% of the linear movements in the dependent variables. In addition, except for equation 4.10, the DW statistics did not show evidence of autocorrelation.

The results show that fiscal deficits had positive impact on inflation (eq.4.6). This means that increase in fiscal deficit <sup>(FD)</sup> means increase in government expenditure which would eventually increase the demand for goods and services and prices of goods in the economy. Positive impacts on unemployment (eq.4.7), positive impact on export (eq.4.8), positive impact on imports (eq.4.9) and positive impact on gross domestic product (eq.4.10).

The results in equation 4.7 which represent unemployment equation showed that all the variables-fiscal deficits, monetary policy rate, money supply and current account balance have positive impact on unemployment rate in Nigeria. The results also suggested that an increase in

any of the variable will cause unemployment to increase. In equation 4.8, the results showed that, fiscal deficits and money supply are positively related to exchange rate and are significant in explaining what happen to exchange rate during the review periods. The results indicated that, an increase in fiscal deficits and money supply will cause an increase in exchange rate, while a decrease in unemployment rate and monetary policy rate are negatively related to exchange rate.

The results in equation 4.9 indicated that the significant determinant of monetary policy rate is inflation rate and that this variable has significant and have negative impact on monetary policy rate. Also, money supply has negative sign but insignificant. Fiscal deficits and gross domestic product were statistically insignificant but have positive impact on monetary policy rate.

In equation 4.10, which represents gross domestic product equation was discovered that inflation rate and current account balance are significant and have positive impact on gross domestic product while fiscal deficits is insignificant but positive. This means that, an increase in inflation rate, current account balance and fiscal deficits will cause an increase in gross domestic product. Also, money supply is statistically significant and negatively related to gross domestic product.

#### 4.1.3 Presentation and Analysis of Results in the monetary Sector Block

Table 4.8: summary of estimated equations in monetary sector blocks

$DM=324.21+0.64FD_t+0.87OILP_t+0.52GDP_t+0.15CEXP_t \dots\dots\dots 4.11$ <p>(43.5)    (2.01)    (3.85)    (8.02)    (1.98)</p> <p><math>R^2=0.91</math>    <math>R^2=0.87</math>    <math>DW= 2.43</math></p>
$MS=8.27+0.28FD_t+0.56GDP_t-1.06EX_t+0.26FER_t \dots\dots\dots 4.12$ <p>(1.74)    (9.68)    (1.94)    (2.53)    (3.12)</p> <p><math>R^2=0.76</math>    <math>R^2=0.74</math>    <math>DW= 5.32</math></p>
$EX=423.219+0.21FD_t+0.09TT_t+0.53OPNES_t+0.38DPL_t+0.15OG_t \dots\dots\dots 4.13$ <p>(762.4)    (1.86)    (2.83)    (3.18)    (4.23)    (2.470)</p> <p><math>R^2=0.98</math>    <math>R^2=0.97</math>    <math>DW= 2.81</math></p>
$DPL=5.687+0.32FD_t+0.73MS+0.9EX_t+0.62OILP_t+0.31FCI_t \dots\dots\dots 4.14$ <p>(7.23)    (2.22)    (4.13)    (8.35)    (0.77)    (2.84)</p> <p><math>R^2=0.71</math>    <math>R^2=0.68</math>    <math>DW= 2.02</math></p>

The equations 4.11 to 4.14 in table 4.8 are the result for the monetary sector block. The results show that all the equations have good fit. The adjusted  $R^2$  is between 0.68 and 0.97. This means



that the regression model explain between 68% and 97% of the linear movements in the dependent variables. In addition, the DW statistics do not show evidence of serial correlation as the figures are more than two.

The variables affecting the demand for money are capture in equation 4.11 with adjusted  $R^2$  of 0.87 and DW equal 2.43. The t-statistics show that all the variables are significant in determining demand for money. The major determinant of demand for money is fiscal deficit which have a direct effect on the demand for money. Equation 4.12 represents money supply equation, fiscal deficit <sup>(FD)</sup>, gross domestic product <sup>(GDP)</sup> and foreign exchange reserve <sup>(FER)</sup> are major determinant of money supply which have a direct effect, while exchange rate <sup>(EX)</sup> which is also an important determinant is inversely related as against positive relationship. In the case if equation 4.13, the determinant of exchange rate <sup>(EX)</sup> is fiscal deficit <sup>(FD)</sup> which is our variable of great concern. The result lies in the suggestion that increase in fiscal deficit <sup>(FD)</sup>, terms of trade <sup>(TT)</sup>, opening <sup>(OPNES)</sup>, domestic price level <sup>(DPL)</sup> and oil and gas <sup>(OG)</sup> would increase exchange rate. Equation 4.15 is representing domestic price level equation <sup>(DPL)</sup>. Our variable of interest is the fiscal deficit <sup>(FD)</sup> which is directly related to domestic price level and significant in explaining what is happening with it. Other variables are according to a priori expectations are all the variables in the equation are positive and significant except for oil price <sup>(OILP)</sup> which is insignificant as shown in the t-statistic.

#### 4.1.4 Presentation and Analysis of Results in the Real Sector Block

Table 4.9: summary of estimated equations in real sector blocks

GDPAGR=5.68+0.07FD <sub>t</sub> +0.54GC <sub>t</sub> +0.42IMPMG <sub>t</sub> +0.12IMPC <sub>t</sub> .....4.15						
(5.29)	(1.94)	(5.18)	(0.76)	(3.03)		
R <sup>2</sup> =0.80 R <sup>-2</sup> =0.78 DW= 2.91						
GDPMNF=2.89+0.57FD <sub>t</sub> +0.13IMPRM <sub>t</sub> +0.23IMPC <sub>t</sub> +0.08GDPAGR <sub>t</sub> +0.68GDPOG <sub>t</sub> ...4.16						
(9.27)	(1.82)	(2.81)	(3.87)	(0.89)	(2.47)	
R <sup>2</sup> =0.96 R <sup>-2</sup> =0.92 DW= 4.26						
GDPOG=3.07+0.64FD <sub>t</sub> +0.06IMPRM <sub>t</sub> -0.25EXPRM <sub>t</sub> +0.67IMPC <sub>t</sub> +0.21GC <sub>t</sub> .....4.17						
(3.89)	(1.95)	(3.14)	(5.15)	(2.91)	(2.01)	
R <sup>2</sup> =0.97 R <sup>-2</sup> =0.96 DW= 1.89						

The objective of the real sector block is to estimate the quantitative impact of changes in relevant variables <sup>(FD, GC, IMPMG, and IMPC)</sup> on sectoral outputs <sup>(GDPAGR, GDPMNF, and GDPOG)</sup>. Equations 4.15 to 4.17 in table 4.9 are the result for the real sector block. The result shows that all the equations have a good fit. The adjusted  $R^2$  is between 78 percent (eq 4.15) and 96 percent (eq4.17). This means that the models explain between 78% and 98% of the linear movements in the dependent

variables. In all the equation eq 4.15 to 4.17 the DW statistics do not show evidence of auto correction ( $DW \approx 2$ ). In equation 4.15, the result shows that the significant determinants of Agricultural output  $(GDP_{AGR})$  are fiscal deficit  $(FD)$ , government consumption  $(GC)$ , import of manufacturing goods  $(IMPMG)$  and import of capital  $(IMPC)$  which have direct effects on output of agriculture and all significant except  $(IMPMG)$  which is insignificant.

Manufacturing sectoral output  $(GDP_{MNF})$  is given in equation 4.16 with adjusted  $R^2$  of 0.92 and  $DW = 4.26$ . Again, there is a positive relationship between changes in  $(GDP_{MNF})$  with changes in all the variables in the equation. The sectoral output of oil and gas  $(GDPOG)$  is given in equation 4.17 with adjusted  $R^2$  of 0.96 and  $DW$  of 1.89. The result provides grounds for several inferences. First, it states that an increase in  $FD$ ,  $IMPRM$ ,  $IMPC$  and  $GC$  would increase  $GDPOG$ ; second, an increase in  $EXPRM$  would reduce  $GDPOG$ .

## SUMMARY, CONCLUSION AND RECOMMENDATIONS

### 5.1 Summary

This study has investigated the impact of Fiscal deficits on macroeconomic variables in Nigeria. Government as an agent of the people requires revenue to provide education, employment, adequate health services, infrastructure and good roads but in the process of discharging this enormous responsibility, expenditure may sometimes outstrip revenue, hence the recourse to deficit financing so as to fill the gap between expenditure and revenue. Budget deficit arose from the fiscal operations of the government. Technically, a deficit would arise whenever expenditure surpasses revenues.

On the whole, from the empirical studies presented in this dissertation, there were conflicting findings by the previous studies dealing with the impact of fiscal deficits on macroeconomic variables. Some of them focused either on cross-section or static analysis and used the same estimation technique. For example, Kelly (1997), Bahmani (1999) and Barro (1991) estimated their models by using OLS method. These studies showed a positive relationship between fiscal deficits and macroeconomic variables while others showed negative relationship.

Also, Sarker (2006), Ghali (1998), Olowononi (2006), Nurudeen and Usman (2009), Barro (1991) among others found support for a negative relationship between fiscal deficits and some macroeconomic variables.

With the divergent estimation techniques and results from different studies on the assessment of the impact of fiscal deficits on macroeconomic variables in view, the need for the present study was justified.

Fiscal deficits had serious implications for monetary policy. Budget deficits had a large positive effect on money creation and the rate of inflation. The Nigeria's economic and financial performances were poor due mainly to the continuation of large fiscal deficits. The high level of macroeconomic instability in the Nigerian economy originated from persistent fiscal deficit. This resulted from the pursuit of expansionary fiscal policy. Literature review shows that several dimensions of fiscal deficits were linked to money supply growth. Also fiscal deficits crowded out private sector consumption and fuelled inflation. The findings support Oyejide (1972) who

found that “the financing of fiscal deficits largely through the banking system, especially the CBN, resulted in a sustained injection of huge amounts of high-powered money into the economy and that the accelerated growth of money supply manifested in a persistent upward movement in prices.

Recurring and rising budget deficits have been a dominant feature of fiscal operations in Nigeria since 1970s. This study has produced mixed results because it has shown that fiscal deficits had significant positive impact on external and domestic debt, and inflation, but had negative impact on capital formation, employment and economic growth.

1. The empirical results of the simulation equations estimated using 2SLS are reported in external sector block, public sector block, monetary sector block and real sector block:

(A) External Sector Block Results

The results indicated high degree of association between the dependent variables and fiscal deficits. That is, fiscal deficits have positive impact on the selected macroeconomic variables such as exchange rate, inflation, price level and real income.

(B) Public Sector Block Results

- i. The results showed that, fiscal deficits <sup>(FD)</sup> had positive impact to exchange rate <sup>(ER)</sup>.
- ii. Fiscal deficit <sup>(FD)</sup> affected monetary policy rate <sup>(MPR)</sup> positively.
- iii. For the gross domestic product equation, the results showed that inflation rate, current account balance and fiscal deficit are positively related to gross domestic product while
- iv. On the whole of the regression results obtained and analyzed, it was discovered that the model for this study has a very good explanatory powers of prediction and the parameters are satisfactory. The results show that the model performance is very satisfactory as the means simulation error is very small.

(C) Monetary Sector Block Results

The results show that fiscal deficits <sup>(FD)</sup> in all the equations are influencing the dependents variables positively and are all significant. This means that increase in fiscal deficits <sup>(FD)</sup> would result in increase in the demand for money <sup>(MD)</sup>, money supply <sup>(MS)</sup>, exchange rate <sup>(EX)</sup> and domestic price level <sup>(DPL)</sup>.

(D) Real Sector Block Results

The results in the real sector block show that fiscal deficits <sup>(FD)</sup> had positive impact on all the sectoral variables, agricultural output, manufacturing and oil and Gas.

## 5.2 Conclusion

The main conclusion is that a large and growing budget deficit in Nigeria was found to be one of the major causes of high inflation, low growth, current account deficit and crowding out of private investment and consumption.

It can therefore be concluded that fiscal deficits in Nigeria has been at the heart of macroeconomic instability.

### **5.3 Recommendations**

In view of the findings, the following recommendations are made to the government and the monetary authorities. In order to curtail deficits, public spending growth rate must be better managed.

The fiscal responsibility Act 2007 should be implemented in order to improve the management of fiscal operations of the Federal and Sub-national governments. This will involve shift away from discretionary to rule-based fiscal operations. The implementation of the fiscal responsibility Act 2007 is expected to increase productivity of government expenditure and keep deficits within the statutory limits. Also goods and services which the private sector can provide adequately should be left to that sector in order to reduce the financial burden of the federal government.

There is need for budget restructuring. The non-oil revenue must increase substantially. There should be a serious review of government expenditure programmes with a view to reducing the size of government.

Government should depend less on banking sector, particularly the Central Bank of Nigeria for loan for financing its programmes. It is recommended that there should be improved revenue collection to reduce government borrowing and the negative effects on the economy.

Government should adopt adequate or appropriate exchange rate policies to ensure that even when these deficits are being paid for, the exchange rate for our domestic currency will not be adversely affected.

Finally, fiscal and monetary policies must be properly coordinated or harmonized in Nigeria to achieve improved macroeconomic outcomes.

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