THE FISCAL AND MONETARY CONDUCTS IN NIGERIA: AN INTERACTION WITH THE BALANCE OF PAYMENTS

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DOCTOR OF PHILOSOPHY
UNIVERSITI UTARA MALAYSIA
May 2013

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Thesis Submitted to
Othman Yeop Abdullah Graduate School of Business,
Universiti Utara Malaysia,
In Fulfillment of the Requirement for the Degree of Doctor of Philosophy

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ABSTRACT

This study examines the fiscal and monetary conducts in Nigeria and their interaction with the balance of payments for the period 1970-2010. It examines how the government adjusts its desired level of nominal expenditure and income from taxes to variations in price level and how fast such adjustments are. Also, the means by which the Nigerian economy absorbs the exchange market pressure (EMP) are determined. Descriptive analysis, three-stage least squares (3SLS), vector error correction model (VECM), autoregressive distributed lag (ARDL) and dynamic ordinary least squares (DOLS) are employed. Evidence from the descriptive analysis suggests that deficit financing mostly through the central bank credit becomes the standard fiscal policy with the implication of increased money supply, rising inflation and balance of payment deterioration. Results from 3SLS show that nominal government expenditure and revenue adjust positively to inflation rate and income level, and government expenditure quickly adjusts while its revenue lags behind. Evidence from VECM reveals that in the long-run and short-run fiscal deficit, price, and private sector credit have significant impacts on money supply. Granger causality results indicate that in the short-run, unidirectional causality runs from money supply to inflation; and from government deficit to price while in the long-run, bidirectional causality runs between money supply and price. Also the DOLS results reveal that domestic credit has a significant negative impact on EMP and that external imbalances are absorbed more by depleting foreign reserves than exchange rate depreciation. These results are capable of providing useful information to policy makers to make useful policies, and to monetary authorities to abide by prudent fiscal operations without relying on the banking system for deficit financing. Generally, the probable policy recommendation is the designation of the appropriate way of achieving credible fiscal behaviour, and the application of credit restriction rules to curtail credit from the banking system for deficit financing.

Keywords: Fiscal Policy, Monetary Policy, Balance of Payment, Exchange Market Pressure, and Autoregressive Distributed Lag Model.

ABSTRAK

Kajian ini meneliti aliran fiskal dan monetari di Nigeria serta interaksinya dengan imbangan pembayaran bagi tempoh 1970-2010. Kajian ini cuba meninjau cara kerajaan menyesuaikan tahap perbelanjaan nominal seperti yang dikehendaki dan pendapatan daripada cukai kepada variasi dalam paras harga, serta kepantasan pelarasannya . Selain itu, cara ekonomi Nigeria menyerap tekanan pasaran pertukaran (EMP) juga dapat ditentukan. Analisis deskriptif yang terdiri daripada tiga peringkat iaitu kuasa dua terkecil (3SLS), model vektor pembetulan kesilapan (VECM), lag edaran autoregresif (ARDL) dan kuasa dua terkecil dinamik formal (DOLS) dilaksanakan. Bukti daripada analisis deskriptif menunjukkan bahawa pembiayaan defisit yang kebanyakannya melalui kredit bank pusat menjadi dasar fiskal standard dengan implikasi peningkatan bekalan wang, inflasi yang semakin meningkat dan kemerosotan imbangan pembayaran. Hasil daripada 3SLS menunjukkan bahawa perbelanjaan kerajaan dan penyesuaian pendapatan nominal adalah positif kepada kadar inflasi dan tahap pendapatan, dan dapat menyesuaikan perbelanjaan kerajaan dengan cepat manakala pendapatannya jauh ketinggalan. Bukti daripada VECM mendedahkan bahawa dalam jangka masa panjang dan defisit fiskal jangka pendek, harga, dan kredit sektor swasta mempunyai kesan ketara ke atas bekalan kewangan. Keputusan kajian penyebab *Granger* menunjukkan bahawa dalam jangka pendek, sebab dan akibat aliran satu arah berlangsung dari bekalan wang inflasi; dan daripada defisit kerajaan kepada harga semasa, dalam jangka masa panjang pula sebab dan akibat dwiarah mengalir antara bekalan wang dan harga. Keputusan DOLS pula mendedahkan bahawa kredit domestik mempunyai kesan negatif yang ketara kepada EMP dan ketidakseimbangan luaran diserap lebih dengan pengurangan rizab asing berbanding susut nilai kadar pertukaran. Keputusan ini mampu menyediakan maklumat yang berguna kepada pembuat dasar untuk membuat dasar-dasar yang berguna, dan pihak berkuasa monetari untuk mematuhi operasi fiskal berhemat tanpa bergantung kepada sistem perbankan untuk pembiayaan defisit. Secara amnya, cadangan dasar yang mungkin boleh dilaksanakan adalah penetapan cara yang sesuai untuk mencapai tingkah laku fiskal yang berwibawa, dan pelaksanaan peraturan sekatan kredit bagi menyekat kredit daripada sistem perbankan untuk pembiayaan defisit.

Kata kunci: Dasar Fiskal, Dasar Monetari, Imbangan Pembayaran, Tekanan Pasaran Pertukaran, dan Model Lag Edaran Autoregresi.

ACKNOWLEDGEMENT

Glory is to Almighty Allah, the lord of the world, the most gracious and the most merciful. He is so merciful to His servants more than a mother is to her child. I thank Him for giving me the opportunity in all it takes to successfully pursue this doctorate degree program. Ho! Allah, all praise is due to you.

My profound gratitude goes to my two supervisors- Assoc. Prof. Dr. Juzhar Bin Jusoh and Assoc. Prof. Dr. Mohd-Dan Bin Jantan for sailing me through the thesis. I thank them for their tolerance, understanding and cooperation through out the time I was under their supervision. Indeed, I found myself fortunate to have them as my supervisors. I pray Allah rewards them abundantly.

I am indebted to some people who have one way or the other made great contributions and invaluable inputs for the realization of this program. Among them are two of my lecturers from UUM in the name of Assoc. Prof. Dr. Jauhari Bin Dahlan, and Dr. Siti Aznor Hj. Ahmad (The then Deputy Dean SEFB). My appreciation also goes to Dr. Ibrahim Waheed, Mr Tajudeen Shola Adebiyi, Mr Abdul Lateef Adebiyi and all well wishers for their supports. My best wishes to you all.

I shall not forget to be grateful to my reputable University (Universiti Utara Malaysia) for giving me the opportunity to carry out this research under a very conducive environment. Thank you so much.

Finally, I really appreciate the backing of my family to pursue this program. I pray for Allah’s mercy on my late father- Alfa Raji Olaniyi Olatinwo and on my living mother- Mrs Maryam Ayoka. My sincere gratitude goes to my eldest brother, Alhaji Raufu Raji and all his younger ones within the Raji’s family for their moral and spiritual supports. I pray Allah for his mercy on us. God bless you all.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

Figure Page

CHAPTER ONE

INTRODUCTION

1.0 Background of the Study

For sometimes now fiscal themes have become sustainable interest in policy debates in many developed and developing countries. Fiscal policy changes are observed to be the significant cause of the current account deficits and play a prominent role in the determination of the future development of external imbalances (IMF, 2004, 2005). Issues relating to fiscal dimensions such as excessive budget and current account deficits, public debt burdens and weak revenues and the issues of appropriate nature, scope and conduct of fiscal policy to maintain macroeconomic stability and economic growth have become the major focus in policy debates.

The fundamental goal of macroeconomic policy (Monetary and fiscal policy) is not just to ensure full employment level, moderate general price level, welfare improvement, level of economic growth and development but also to guarantee their stability in order to bring about confidence in the economy. Stability of economy enables the government and individual agents to have a well and effective projection for future. In addition, economy stability enhances socio-economic welfare by stabilizing the fluctuations in income and consumption (Swanepoel, 2004).

Monetary policy performs the main function of macroeconomic policy. For this reason it is faced with the challenge of maintaining stable inflation rate in a volatile environment of the economy. In the course of performing this function, the economic goals of the government must also be supported to realize the general macroeconomic objectives. On the other hand, fiscal policy also performs the fundamental function of efficient resources allocation, equitable distribution of income and the stabilization of economic activities by employing automatic fiscal stabilizers and/or discretionary fiscal measure. The relevance of government expenditure and revenue composition in deciding the extent to which government employs its budget to effect economic policy cannot be overlooked. This is because sustainable government spending is related to the fiscal policies' stabilization function. Frequent public deficit often weakens the government expenditure's stabilization function and in the long run, appropriate fiscal policies tend to ensure that government spending is sustainable with the outcome of improving the environment that supports the growth of the economy.

According to European Central Bank (2003), monetary and fiscal policies are linked to each other with respect to the realization of their primary objectives. Fiscal policy affects most of the variables (such as real rate of interest, output level, and total demand) which are often taken into consideration by monetary authorities in stabilizing price level. On the other hand, monetary policy affects variables (such as short run rates of interest and anticipated inflation) which influence the macroeconomic environment where the operation of fiscal policy takes place. Both policies, fiscal and monetary, are related in the sense that an expansionary fiscal policy quickly transforms into economic growth in the long run. This phenomenon is put into consideration by the monetary authorities while formulating monetary policy because of its consequence on the general price level stability.

More so, government borrowing causes an increase in the equilibrium level of real rate of interest. For example, the more government borrows money the more it has to issue bonds and by so doing, the supply of bonds increases. This decreases the price people are willing to pay for bonds as there is more supply. Therefore, the interest rate on bonds rises. The real interest rate (or real rate of return) on an asset is the rate at which the real value or purchasing power of the asset increases over time while the nominal interest rate (or nominal rate of return) on an asset is the rate at which the nominal value of the asset increases over time. For a given expected rate of inflation, movements in the nominal interest rate are matched by movements in the real interest rate. When anticipated inflation reduces (increases) real interest rate, capital accumulation occurs (do not occur) and thus output increases (decreases). For this reason, fiscal policy influences output in the long run and this necessitates monetary policy's adjustment. According to Swanepoel (2004), the probable policy implication here is that fiscal policy ought to strive to sustain an environment suitable to make macroeconomic variables stable. The monetary policy should from time to time serves as a watchdog to the fiscal policy position for its effectiveness. Therefore, fiscal policy influences the economy where monetary policy is implemented and essentially, fiscal policies can bring about improvement in the economy where the monetary authority carries out its operation by giving support to make macroeconomic variables stable.

Fiscal policy plays significant roles in economic performance of any country. It influences funds availability as well as the level of country's economic activities. The economic basis of fiscal policy is to influence a counter cyclical policy so that the booms and burst during the course of business cycles are offset. Sturm, Gurtner and Alegre

(2009) describe countercyclical policies as those which have the objectives of reversing the present direction of the economic or business cycles. For instance, the pursuance of expansionary monetary and fiscal policies at the periods of economic recessions or period close to recessions is countercyclical in nature. Similarly, monetary and fiscal policies which lessen economic activity at the period when economies are overheating are also countercyclical. However, monetary or fiscal policy which are designed and pursued in support of the present economic or business cycles are considered procyclical. One study, Talvi and Vegh (2000) finds evidence in developing economies as well as in industrial countries which do not belong to Group of seven that pro-cyclical fiscal policy (understands as expenditures (taxes) rising (decreasing) in booms and the opposite in recessions) is a fact that is felt throughout the countries.

Swanepoel and Schoeman (2003) point out that fiscal policy is useful in economic stabilization via the working of automatic stabilizer. According to the authors, public balances tend to increase or decrease with respect to increase or decrease in output beyond certain level. For example, in the period of economic boom, there is increase in the level of output, income, consumption and employment. Consequently, the income of the government increases as a result of taxes increase while government spending on payment of unemployment benefit reduces. The opposite is experienced in the period of recession. When government increases its debt, the domestic demand will increase such that the automatic fiscal impact regulate the recession moderately while a decrease in government borrowing tends to reduce economic booms.

The budget balance of the federal government of Nigeria consists of its expenditure and revenue. The revenue is made up of foreign and domestic components. The foreign component which is mainly oil revenue is externally determined according to the international prices of oil and the level of production given the fact that Nigeria belongs to the organization of petroleum exporting countries (OPEC). The domestic component which is non-oil revenue is generated mainly from the direct taxes such as personal income, company income, and property income tax. Other non-oil incomes are generated from excise duties on goods produced at home and the indirect taxes like import and export duties.

The total federal government expenditure also comprises domestic and foreign components. Federal government expenditure to the rest of the world is considered to be external debt services, and capital expenditure such as spending on security and defence. The gap between the total federal government expenditure and the sum of external debt services to expenditure on defence gives the federal domestic expenditure. This represents the proportion of federal government domestic contribution to money creation in the economy.

Fiscal policy influences the achievement of price stability in the economy. However, government expenditure and revenue as components of fiscal policy are also being influenced by the inflationary developments. This is because inflation causes the public sector services and investment to be costlier than used to be when there was no inflation. As a result, the budgetary expenditure for transfer payments among others and the realized public sector revenue tend to increase. Interestingly, the rate at which the public sector expenditure and revenue respond to the consequences of increase inflation differs. In their study of developing countries with respect to the relationship between inflation and fiscal deficit, Aghevli and Khan (1978) have pointed out that public sector expenditure adjusts at a faster rate than its revenue in response to variation in the level of price with the consequence of public sector deficits.

In Nigeria, government budget deficits are usually financed by domestic credit creation, borrowing from abroad, and by drawing down on foreign reserves. However, excessive use of any of these financing means bears relation with macroeconomic imbalances. According to Oyejide (2003), any variation in government spending should be financed by a variation in revenues generated from tax, a variation in public debt, or a variation in the high powered money (monetary base). It follows that budget deficits which stand for a variation in public spending that is not offset by a respective variation in income from tax should be catered for by creating money or by accumulated government debt. In the case of accumulated government debt, it can be sourced through external means or internal means such as from the banks and nonbank public. Therefore, fiscal operations of government are associated with the supply of money through the method of financing the fiscal deficits. This brings about another way by which monetary and fiscal policies are linked together.

In Nigeria, successive governments resort to external borrowing which consequently leads to the debt overhang that currently constitutes a serious challenge to the economy. The debt stock of government increases as the yearly fiscal deficits largely build-up. With huge debt service payments outflow, the growth of the domestic economy is constrained in a manner that the resource that would have been invested in the economy is diverted to service the external debts. Economically, this has different implications based on the kind of domestic expenditure the debt is financing.

One, there is a case when the expenditure on investment is maintained to rise while savings are decreasing or constant relatively. It implies that countries borrow in order to accumulate capital with which to increase future income. Two, there is a case when consumption rises in relation to income while investment spending is constant relatively. It implies that countries borrow to finance current consumption expenditures without any definite effect on economic growth or future income. (There could, of course, also be a combination of increased investment and reduced savings). Accordingly, there could be no much problems of debt repayment in the first possibility once the investment projects embarked upon are profitable. An increased future income streams should provide enough funds for repayment of the principal plus interest. Borrowing for consumption purposes, however, never gave a definite potential for repayment in the future. This may call for a consumption reduction sometime in the future to save fund means to repay the debt without decreasing domestic wealth.

Also, credit creation of the Central Bank became the most frequently use means of financing government deficits. This affects the domestic money supply and price level which in turn affect trade balance and external debt. Excessive and prolonged deficits financing through the Central Bank which essentially creates high powered money may negate the attainment of macroeconomic stability which may in turn stifle economic growth. In general, an increase in budget deficit tends to raise domestic absorption and worsens the balance of payment. For example, when excess money is created due to deficit financing, the real money balances of domestic households become larger and they will want to get rid of the excess money by increasing their aggregate spending on goods. The domestic prices of goods go up more than the prices of foreign products as a result of demand pressure thus making foreign goods cheaper. Domestic households now demand for foreign products thereby making import to be higher. Consequently, the demand for domestic products by foreign households declines thus reducing export. This creates channel for a trade balance deficit. The alternative means of disposing the excess money balances is to buy foreign assets, which is recorded as capital account deficit. The two ways of getting rid of excess money balances have consequences on the balance of payment.

Nigeria, since 1975 has been facing imbalances in its fiscal operations and this has reflected in fiscal deficit annually. Fiscal imbalances in the form of large budget deficit have been the frequent issues in Nigeria according to the Central Bank data. For instance, the analysis of fiscal balance from 1970 to 2003 indicated that the consolidated government (including local, state and federal) overall fiscal balance began with the surplus of 0.9% of GDP in 1970-74, though the local and state governments were not included at that time. However, during 1975-79, fiscal deficit was recorded, amounting to 9.5% of GDP and this started rising until 1990-94 when it got to 10.6% of GDP. During 1995-1999, the overall deficit declined to 2.6% of GDP but started rising again until it was 4% of GDP in 2000-2003. At the period 1985-89, the deficit recorded was 7.8% more than the targeted 3% of the GDP. The overall deficit fluctuated with the low values of 1.1%, 0.5%, 0.6%, 0.2% and 3.3% of GDP for the year 2005, 2006, 2007, 2008 and 2009, respectively. Comparison of the overall fiscal performance of the central government shows the country's deficit of #810 billion (where # is the symbol of Nigerian currency called Naira) equivalent to 3.3 % of GDP in 2009 as distinct from the deficit of #47.4 billion in 2008, equivalent to 0.2% of GDP, Central Bank of Nigeria (CBN, 2009).

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This phenomenon of fiscal imbalances has brought challenges to the economy due to its long time consequence of eroding confidence in the Nigerian economy as well as promoting a sizeable wastefulness of the national resources and constrains the strength of the economy to grow. In particular, persistent and rising budget deficits were important characteristic of fiscal operations in Nigeria right from the last quarter of the 1970s. One major factor deciding budget deficit in Nigeria could be traced to the growth in public expenditure while the increase in public outlay was precipitated by rising oil revenue income (Egwaikhide, 1997, 1999).

However, the Nigerian economy has passed through unavoidable strains and stresses from the moment of the oil boom collapse in 1981. Nigeria had enjoyed increase inflow of foreign exchange as well as increase federally collected revenue due to frequent increase in the price of crude oil in 1970s and the early 1981. For example, the prices of crude oil were US$2.0/barrel and US$4.1/barrel in 1972 and 1973, respectively. The price rose rapidly to the amount US$4.7/barrel, US$14.33/barrel, US$29.29/barrel, and US$37.00/barrel in 1977, 1978 1979 and 1980, respectively and again rose to US$40.00/barrel in 1981. The increases in oil export revenues were probably due to the result of crisis in the Middle East, particularly the war between Arab and Israeli during the year 1973-1975 which had boosted the average annual value of Nigerian export. The sky-rocketed oil prices resulted in boom for the Nigerian economy as one of the countries exporting oil (CBN, 1985). Nonetheless, the boom in world price of oil had burst by the middle of 1981. There had been a sudden drop in the price, and the drop sharply continued to hit US$18.00/barrel and $10.00/barrel in 1983, and 1985, respectively. Within the first half of the year 1989, the fluctuations in the price of oil had ranged from US$16 to US $18/barrel. The collapse of the oil-boom possibly brought about by oil-glut or by apparent reduction in the quota to produce by the Organization of Petroleum Exporting Countries (OPEC) had motivated strains and stresses faced by Nigerian economy at that period. For example, the quota for Nigeria's production as determined by OPEC was reduced from about 2.3 million to 1.3 million barrels/ day in the 1970s and early 1980's, respectively. However, the number of barrel to produce per day had risen to about 1.5 million in 1989 (CBN, 1994).

The situation was worsened due to the weakness nature of the economy’s structure which relied heavily on the exportation of crude oil for its foreign exchange earning and on imports for industrial production, in the face of declining foreign earnings. To bridge the gap, each level of governments had resorted to internal and external borrowing. Subsequently, the Nigerian total debts (external and internal) had been on the increase. For example, the Nigerian total debts have ranged from #1.3 billion to #3,995.7 billion from 1970 to 2009. The debt rose to #10.1 billion, #45.2 billion, #382.7 billion and #1,194.6 billion in 1980, ’85, ’90, and ’95, respectively. The increase in total public debt from 1970 reached a peak of #3,995.7 billion in 2000 and declined slightly by 6.38% or #6.4 billion in 2005, and sharply by 36.6% or #1,462.2 billion in 2006. This development was a reflection of a decline in total external debt as compared with the total domestic debt at those periods. Nigeria gained the advantage from the huge debt waived by the creditors following an agreement reached and endorsed by Nigeria and Paris Club on October 20, 2005 over the 60% of Nigeria debt written off by the creditor, Paris Club (Paris Club, Press Release, Nigeria, 2005). The debt forgiven amounted to US$18 billion. However, in 2009, the consolidated debt stock of the federal government stood at #3,818.5 billion or 15.4% of GDP as against #2,813.5 billion or 11.6% of GDP in 2008 (CBN 2009).

Following the moment of the oil boom collapse in 1981, there had also been considerable reduction and fluctuation in the Nigerian external reserves during the period. For example Nigerian foreign reserves rose from US$156.6 million in 1970 to US$3,286.3 million in 1976 and fell to US$1,298.9 million and US$3,059.8 million in 1978 and 1979, respectively. In 1980, the reserve rose to US$5,462 miliion and fell continually to US$2,441.6 million, US$1,043.3 million, US$224.4 million, US$710.1 million, US$1,657.9 million, and US$2,836.6 million in the year 1981, 1982, 1983, 1984 1985, and 1986, respectively. These periods marked the periods of burst in oil boom when its world price fell considerably. The reserve increased to US$7,504.6 million in 1987, but declined to US$1,429.6 million in 1993. However, in the following year, 1994, the Nigerian reserve recorded US$9,009.1 million and since then continued to fall till 1999 to the amount of US$5,424.6 million. In 2000 and 2001, it rose to US$9,386.1 million and US$10,267.1 million, respectively and decreased to US$7,467.8 million in 2003. The reserves continued to improve by increasing from US$16,955.02 million in

2004 to US$53,000.36 million in 2008 but however fell to US$42,382.5 million and US$32,339.25 million in 2009 and 2010, respectively (CBN, 2010).

Consequently, the related pressure mounted was observed in the persistent balance of payment deficits. For example, in 1970, the overall balance of payment recorded surplus of #46.6 million (where # is the symbol for Nigerian currency, Naira) and the surplus continued till 1975. After 1975 period, the overall balance of payments deficits have been frequently recorded. For example, in 1976, '82, and '83, the deficit recorded were #339 million, #1,398.3 million, and #301.3 million, respectively. There was improvement in 1984 but could not be sustained. From 1985 and 1996, deficits recorded in the overall balance of payment were #349.1 million and #53,152 million, respectively. Similarly, in 1998, '99, 2002, and 2003, respectively, the deficits recorded were #220,671.3 million, #326,634.3 million, #563,483.9 million, and #162,298.2 million. The pressure relieved on the external account brought about the overall balance of payment surplus of 10.0%, 9.5%, 5.5% and 0.8% of GDP from 2005 to 2008, respectively. However, the overall balance of payment deficit of 7.7 % of GDP and 5.97 of GDP were recorded in 2009 and 2010, respectively (CBN, 2010).

As the boom in oil eventually burst due to excess supply at the foreign oil market, the structure of Nigerian economy which was not stable was not readily prepared to meet up with the shock. Consequently, the effect of the shock was greatly reflected in the position of the country's balance of payment (Richard, Maxwell, Hari, & Christopher, 2006). Balance of payment is a statement of account which shows the economic transaction (which is reflected in the claims and liabilities) of a particular country with the rest of the world. The account of balance of payments records the economic performance of a country at the international level. It consists of two major accounts namely, the current account and capital account. The former takes record of all transactions involving goods and services, with unreturned transfers in a country while the latter account takes record of all exchanges and money capital involving various kinds of real or financial assets. The capital account is essential as it relates the domestic transactions to international transactions (Fleermuy, 2005). Since 1980s, the trend in the fluctuations of Nigerian balance of payment has been increasing. This crisis also causes fluctuation in the smooth working of the economy since it causes disequilibrium between the supply of and demand for money. This implies that disequilibrium in the balance of payment is traced to disequilibrium in the money market (IMF, 2000). It is noted that the fluctuation in the balance of payment of Nigeria has money illusion, term of trade, movement in exchange rate (devaluation), increased domestic debt, and external debt servicing as motivating factors (Olaloku, 1979). When there is disequilibrium in a country's balance of payments, authorities often strive on how to correct it. There is always a debate either to resort to policy action or any self-correcting mechanism to remedy such a situation. For several years various adjustment techniques have been noted to deal with the disequilibrium in a country's balance of payment (Du Plessis, Smit, & McCarthy, 1998).

The imbalances in external sector brought about by non equalization of domestic demand and supply of money which remedy requires either variation in exchange rates or international reserves or both can be measured by Exchange Market Pressure. Girton and Roper (1977) define Exchange Market Pressure as the endogenous variable of net foreign assets or international reserves and variations in exchange rates which take control of the pressure exerted by excess increase in the supply of money more than it is required for demand, given a freely or managed floating system.

In order to return to equilibrium money market position, three regimes of exchange rate can be considered as alternatives. For example, in a fixed exchange rate regime, changes in the net international reserve serve as the medium of adjustment to equalize demand for and supply of money. When the exchange rate is fixed and the level of price is high, home economy is not competing with respect to purchasing power parity. This is because, with a fixed exchange rate, an increase in the domestic price level will, for a constatnt foreign price level, increase imports and cause exports to decline. Foreign goods will be relatively cheaper and exports will be more expensive to foreign buyers. High prices of domestic goods relative to its foreign goods will make it difficult for domestic goods to compete favourably with the foreign goods. In order to avoid depreciation of home currency, the authorities will have to come in to buy home currency, international reserves begin to fall beyond the starting level, demand also begins to fall on aggregate, and the level of price returns to its origin. On reaching the long run, output level, price level as well as stock of money get back to their original levels. Therefore, with fixed exchange rate, when domestic assets increase, international reserves decline. The decline in the reserves brings about the money stock to get back to its initial level (Parlaktuna, 2005).

In a free floating exchange rate, variations in net exchange rates serve as a medium of adjustment to equalize demand for and supply of money. When there is monetary expansion beyond the level of equalizing money demand, there results money market imbalances. As a result, there is a rise in aggregate demand for goods. This, in addition, increases the demand for foreign good which requires foreign currency. The pressure on the foreign currency depreciates the domestic currency. Also, the excess demand for goods makes home price to rise and the demand for money begins to rise. Given the increase in the level of home prices, the money demand also increases thus decreasing the aggregate demand till the level of equilibrium is attained (Pilbeam, 1998).

Lastly, in the regime of managed flexible exchange rate, the adjustment takes place in both supply of money and the demand for money. The monetary authority in the country will have to come in the market for foreign exchange with the alternatives of either amassing or given up foreign reserve to respectively avoid abnormal valuation or devaluation of the domestic currency. By given up foreign reserve and by exchange rate devaluation, certain percentage of external imbalance is put right. This is also the same by building up foreign reserve and by exchange rate appreciation. Therefore, money supply in the country is influenced by unfavourable balance of payment (Salvatore, 2001).

Just like other countries, the consequences of adopting floating exchange rate system on the Nigeria economy have become a significant issue for the economy (Jimoh, 2004). The operation of exchange rate in Nigeria is traced from1960 to 1986 where a fixed exchange rate system was operative. For most of the periods, deficit balance of payment was prevalent (CBN, 1985). From 1986, the exchange rate became volatile with potential depreciation. This had considerable adverse effect on monetary stability and trade balance. As a result, the Nigeria authorities took a drastic step to change to a floating exchange rate system with a view to solve the reoccurrence of deficit in the balance of payments. Correcting the external imbalance has a burden which rests on the deficit countries since their accumulated reserve is thin. The Nigerian international reserve had reached an alarming level when it dropped from #2,427, million ($ 15.811 million) to #747.7 million ($4.871 million) in 1983. To correct this situation, the economy switched to operate a more freely floating exchange rate system (CBN, 1983). In 1994, floating foreign exchange market (FEM) which was in operation since 1986 was discontinued and both interest rate and exchange rate were fixed at 21% and 22 Naira per US dollar, respectively, Nigeria Deposit Insurance Cooperation (NDIC, 1994). However, the fixed Nigerian exchange rate was coincidentally equalled to the previling rate determined by the exchange rate market. In 1995, autonomous foreign exchange market (AFEM) was introduced but the CBN could intervene where necessary. In order to improve the performance of the economy competitively, both the interest rate and the exchange rate were completely left for market determination in 1996 (NDIC, 1996). On the whole, one can conclude that Nigeria has been operating floating exchange rate since 1996 till date while the deficit in balance of payment still persists.

1.1 The Statement of the Problems

Fiscal imbalance has been the case in Nigeria with huge fiscal deficits since 1975. This has had a great effect of general rising prices and to that extent, weakens the competition the country would have had in its non-oil sector and retards the economic growth of the country. Severe fiscal crisis and worsening balance of payments deficit have in particular characterized the Nigerian economy since the late 1970s. Over the years, the economy has also been facing the problem of escalating domestic and external debt and heavy debt-service burden. These major economic problems in Nigeria have constituted worry among the economists and policy makers as the problems reinforce one another through the process of causation. The search for the fundamental causes of these problems has become imperative as it is generally thought to be linked to adverse external developments. Identifying which of these external shocks predominate has been a significant challenge to the policy makers. The focus of the debate on the factors responsible shifted to the role of domestic factors in its search for remedies to the domestic economic problems.

The choices of fiscal policy have been argued to have important effects on the performance of the economy in oil producing and exporting nations like Nigeria. This is due to the significant nature of the country's oil sector and because oil incomes realized mostly accrue to government's coffer (Sturm, Gurtner & Alegre, 2009). However, fiscal policy in oil producing Nigerian nation has faced some challenges of how to sustain government expenditure and revenues in the future and how to stabilize macroeconomic variables in the economy by a well fiscal plan. Reactions by the concerned authorities in response to the fiscal challenges in Nigeria have involved fiscal rules, the presumption of the price of oil in its budget, and how to stabilize oil incomes saved. Meanwhile, fiscal policy has been expanding rapidly since 1975 in Nigeria as an oil producing and exporting nation following the increase in world oil prices. Consequence upon fiscal expansion is the rise in inflation rate in the economy while monetary policy remained handicapped to remedy the pressure imposed by inflation due to the on going system of exchange rate.

In a causation form, it has also been argued that inflation pressure has significant positive impacts on the government deficit. A considerable increase in inflation causes government to expend more to the extent of running deficits and through its financing leads to increase in money supply which further increases inflation (Aghevli & Khan, 1978). Therefore, the expansionary fiscal policy of Nigerian government over the years, probably due to rising domestic inflation, stimulates domestic demand and provides probable link to the problem of increasing fiscal deficit. For example there was an upward trend in the federal expenditure from the lower level of #900 miliion to #15 billion in 1980 but this could not be sustained as it dropped in 1985 to 19.1% of GDP or #13 billion from 30.2% of GDP when compared with 1980.

The decline in the total expenditure from #15 billion, in 1980 to #13 billion in 1985 could be attributed to the demand management measures executed in the early 1980s to tackle the fiscal imbalance that resulted from unexpected decline in government revenue due to a decline in the world price of crude oil in 1981. However, the government expansionary fiscal policy reflected in its total expenditure had increase through 1980s from #60.3 billion to #1,938 billion in the year 1990 to 2006, and to the total of #2,450.9 billion in 2007. Comparison of the development indicates that total expenditure increased by #1,002.1 billion or 2.0% as proportion of GDP in 2009 when compared with 2007. Similarly, the comparison of 2009 with 2008 shows that aggregate expenditure of the federal government rose by 6.7% to # 3,453 billion in 2009. Considering the proportion of the total expenditure to the economic growth for the two years, shows that the total expenditure increased to 13.9% in 2009 from 13.3% in the preceding year (CBN, 2009).

Despite efforts made to limit government expenditure in relation to tax revenue, overall budgetary position of the government still remained expansionary. This implies that even if government is aware of the necessity to lower expenditures at the time of rising inflation, it still finds it uneasy to curtail its previous commitments in real terms. Therefore, government's capital expenditure overtime, mainly on import items dominates and this seems to have put more pressure on the balance of payments with the consequence of current and capital accounts deficits.

Given this situation, the overall balance of payments recorded annual deficits for most of the period between 1970 and 2010. For example, after 1975 period, overall balances of payment deficits had been recorded. Data indicates an increase in deficits of #339 million from 1976 to #1,398.3 million in 1982, and #301.3 million in 1983. However, there was improvement in 1984 but could not be sustained. Deficit recorded in the overall balance of payments increased to #349.1 million in 1985 and fell to #53,152 million in 1996. Similarly, in the year 1998, '99, 2002, and '03, the deficit recorded were respectively #220,671.3 million, #326,634.3 million, #563,483.9 million and #162,298.2 million. The overall balance of payments surpluses of 10.0%, 9.5%, 5.5% and 0.8% of GDP from 2005 to 2008, respectively were occasioned. However, overall balance of payment deficit of 7.7 % of GDP and 5.97 of GDP were recorded in 2009 and 2010, respectively (CBN, 2010).

Deficit financing by domestic credits from banking system (particularly Central Bank) and foreign borrowing became imperative. Consequently, since the early 1980s, Nigeria has been faced with huge debt burden and debt service difficulties. For example the

Nigerian total debts have ranged from #1.3 billion to #3,995.7 billion from 1970 to 2009. The increase in total public debt from 1970 got to a peak level of #3,995.7 billion in 2000 and declined slightly to #3,995.7 billion in the fiscal years 2009. The decline in total debt from 2005 to 2009 could be attributable to the Nigeria debt forgiven which amounted to US$18 billion.

Nigeria has benefited from the huge debt waived by the creditors following an agreement reached and endorsed by Nigeria and Paris Club on October 20, 2005 over the 60% of Nigeria debt written off by the creditor, Paris Club (Paris Club, Press Release, Nigeria, 2005). However, in recent time Nigeria external debt and its total domestic debts still stood at #689,845.3 million ($4,494,106,190) and #8,708,545.4 million ($56,733,194,790), respectively in 2010 (CBN, 2010). This amount when compared to the GDP is considered to be high for the developing economy. For examples, the GDP in 2010 was #775,525.7 million ($5,052,284,690) which was smaller than the outstanding debts. The efforts of the recent past government in 2006 in soliciting for debt cancellation and rescheduling has considerably helped in the reduction of the outstanding external debts of Nigeria during the period. However, the choice of financing deficit by domestic credit has its probable associated implications for the country. In spite of the fact that it increases domestic money supply and price level which in turn affect trade balance and external debt, it tends to raise domestic absorption and worsens the balance of payment. With domestic credit serving as offsetting means of absorbing disequilibrium in the Nigerian balance of payments, it implies that certain proportion of the country's foreign reserve outflow or exchange rate depreciation or the two simultaneously are being accommodated by the country. Losing the Nigerian international reserve excessively and a greater depreciation of its exchange rate at the same time for the absorption of the external imbalances or exchange market pressure also has important implication for the economy. This phenomenon has brought challenges to the economy due to its long time consequence of eroding confidence in the Nigerian economy as well as constraining the strength of the economy to attract foreign investment for economic growth and development.

Consideration of the movement in the directions of the variables involved in these associated problems suggests that the overall budget deficit and domestic credits creation which are probably motivated by rising general price level (domestic inflation) or otherwise have significant contributions to the problems of balance of payments as well as public debt problems in Nigeria. In view of the forgoing problems, the research addresses the following fundamental questions:

i. What are the historical trends in the development of budgetary and balance of payments in Nigeria?

ii. How do the authorities of Nigerian government adjust the desired level of alternative forms of nominal spending and income from taxes to a variation in the level of price, and how fast are such adjustments as shown in the actual spending adjustment decision?

iii. What roles do fiscal deficits and domestic credits to private sectors play in influencing the growth of money supply in Nigerian economy?

iv. What are the long and short run directions of causation between a pair of price level, real money supply, government fiscal deficit, interest rate and real output?

v. And lastly, by what means does the Central Bank of Nigeria (monetary authority) absorb the exchange market pressure or external imbalances in Nigeria?

1.2 Objectives of the Study

The broad objective of this research is to examine the effects of fiscal and monetary policy on the balance of payments in Nigeria from 1970 to 2010. This will be achieved through the following specific objectives:

i. To analyze the fiscal, monetary and balance of payment developments in Nigeria.

ii. To examine how the authorities of Nigerian government adjust the desired level of alternative forms of nominal spending and income from taxes to a variation in the level of price, and how fast are such adjustments as shown in the actual spending adjustment decision.

iii. To investigate the roles played by the fiscal deficits and domestic credits to private sectors in influencing the growth of money supply in Nigerian economy.

iv. To examine the long and short run directions of causation between a pair of price level, real money supply, government fiscal deficit, interest rate and real output.

v. To determine the main means by which the exchange market pressure or external imbalance is absorbed by the monetary authority in Nigeria.

1.3 Significant of the Study

This study analyzes the fiscal, monetary and balance of payment developments in Nigeria with a view to unfolding their strengths and weaknesses in performance. The analysis may likely serve as guide to the designation of the appropriate policy to realize credible fiscal behaviour in governments since fiscal policy response to inflation development appears to be one of the root cause of the country's macroeconomic problems (See Table 4.8 for the monetary policy targets and outcomes on domestic credits; and Table 4.9 for the monetary policy targets and outcomes on money growth and inflation). The analysis may also shed light on the best way the public expenditure and budget management could be planned to ascertain that public resources are channelled to the right use in the economy. It could provide the right clues to the government on how to widen its resources and prevent the public expenditure and revenue from been liable to the vulnerability of the unstable world oil prices. This to a large extent could serve as a probable way of reducing credit from the banking system as source of deficit financing which consequently reduce money supply, inflation and balance of payment problems.

Aghevli and Khan (1978) formulated models for the establishment of fiscal deficit and put forward a basic proposition that government expenditure would adjust faster to its desired level than government revenue in response to variation in the level of price. In this case, the coefficient of adjustment of the former is greater than the coefficient of adjustment of the latter thus, resulting into public sector deficits. This is due to institutional factors such as inadequate tax administration system, weak system of tax collection, a tax system characterized by a long elasticity of collection and long collection lag. Finally federal government of Nigeria finds it difficult to reduce their commitments in real terms by restraining expenditures during the periods of inflation. Studies (Aghevli & Khan, 1978; Heller, 1980; Kilindo, 1997) have tested this hypothesis with respect to inflation and government deficit in developing countries except Nigeria exclusive. It was suggested that the application of the model originally designed for hyperinflation countries can as well be appropriately for moderate inflation countries. Since Nigeria is a moderate inflationary country and the models have not been applied to its data before, this study applies the models to Nigeria data to test the proposition and establish government deficit. In addition, the current study provides the connection of the central government deficit response to inflation. Thus, the government expenditure and revenue lags upon which the connection hinges were estimated rather than imposing it on a priori basis as done in the previous studies conducted in Nigeria. By so doing, this study differs from those previous studies and contributes in this aspect.

Furthermore, this study aims at finding out the way the Nigerian central authorities adjust its desired level of various types of nominal expenditures and revenues to a variation in the level of inflation. Also it examines the rate at which such adjustment takes place as indicated in the decision of actual spending adjustment. Coming up with the results that government expenditure adjusts rapidly more than its revenue may informe the imminent of fiscal deficits. Such information if known may likely suggest the necessity to review the present budgetary stimulus to inflation with commitment and determination in order to be able to make adjustment where necessary.

This study tends to establish the relationship among the macroeconomic variables such as those related to the determinants of money supply, and investigate the causality between a pair of price level, real money supply, government fiscal deficit, interest rate and real output. Doing this could facilitate proper understanding of the role played by the fiscal policy-inflation relation in the creation of the growing balance of payments problems in Nigeria. Knowing this is capable of providing suggestions which could be useful in preventing further worsening of the crisis. In addition, having the knowledge of the interactive effects of these variables concerned could provide more information about the extent to which expansionary fiscal policy has constrained the conduct of the monetary policy in realizing a reasonable general prices level or inflation. This in effect could serve as a signal to the monetary authorities to abide by prudent fiscal operations which will not rely on banking system, particularly Central Bank of Nigeria, for financing. More so, it could motivate effective coordination between monetary and fiscal policies which could further be maintained and strengthened.

Some studies have provided evidences of positive results on the relationship between fiscal deficit and current account deficit. These studies for example, include the study of Piersanti (2000) for seventeen OECD countries, Abell (1990) and Bundt and Solocha (1988) for United States, Kearney and Monadjemi (1990) for Argentina, Britain, Canada, France, Germany, Ireland, Italy, United States, and Vamvoukas (1997) for Greece. Other studies include that of Morgan (1979) for 12 developing oil countries, Aghevli and Sassanpour (1982) for Iranian economy, Zaid (1985) for 12 developing countries, Vaez-zadeh (1989) for Venezuela, Khalid and Guan (1999) for 5 developing countries, Akbostanci and Tunc (2002) for Turkey, Saleh, Naair and Agalawatte (2005) for Sri Lanka, Pahlavani and Saleh (2009) for Philippines, Anoruo and Ramchander (1998) for 5 Southeast Asian Countries, Arize and Malndretes (2008) for 10 African Countries, Ariyo and Raheem (1991), Egwaikhide (1997, 1999), Olopoenia (1991), Onafowora and Oluwo (2006), and Soludo (1997), for Nigeria. On the other hand, there are also evidences against the twin deficits which imply that Ricardian equivalence that the budget deficit has no effect on the trade deficit holds. The studies that found evidences against the twin deficit include the study by Khalid and Guan (1999) in a sample of five developed countries, Zaidi (1985) in the case of Brazil, Samadi (2006) for Iran Jordan Kuwait, Morocco, Oman and Tunisia, and Enders and Lee (1990) for United States. However, the above studies have largely reported mixed and conflicting results to the extent that it has become inconclusive. Besides the studies of the balance of payment problem in Nigeria have been very few and there is a need to have more studies in this area bearing in mind the importance of overcoming external imbalances.

Girton and Roper (1977) came up with a new monetary model of Exchange Market Pressure (EMP). The model is based on the monetary approach to the Balance of Payments and a monetary approach to exchange rates determination. The EMP model has been tested by some studies in various developed and developing countries to determine its sensitivity and to determine how an economy absorbs external imbalances. For example, studies that have applied the EMP model include the study of Girton and Roper (1977) for Canada, Connolly and da Silveria (1979) for Brazil, Modeste (1981) for Argentina, Kim (1985) and Mah (1991, 1995) for Korean, Thornton (1995) for Costa Rica, Parlaktuna (2005) for Turkey, Bielecki (2005) for Poland, Ghartey (2002) for Jamaica and Ghartey (2005) for Ghana. In spite of the fact that Nigeria is a small economy opened to the rest of the world and accepts world prices and monetary conditions as given, this EMP model has not been applied to its data to test the model proposition and to determine the sources by which the country absorbs external imbalances or overall balance of payment disequilibrium. Closing this gap is an important motivation for this study.

Although Jimoh (2004) examined how relevant is the monetary approach to a floating exchange rate in Nigeria over the period 1987 to 2001, yet he did not actually apply monetary model of EMP which encompasses both exchange rate and foreign reserves as its components. This study therefore chooses to test the EMP propositions on Nigeria data as Nigeria's experience will serve as another good example in this field. Paying attention to EMP instead of emphasizing the amount of exchange rate variation is in practice relevant, for 82% of the currencies in the world are being either fixed, freely float or managed float (IMF, 2009).

An EMP was developed and used to cover a broad range of exchange rate systems, from fix to floating to manage float. Since the theories of exchange rate and balance of payment significantly pay attention to tensions mounted in the market for foreign exchange, be it fixed or floating rates, EMP has the capability of integrating the two theories. EMP as compared to exchange rates variation can have more relevance in determining other phenomena. For example, EMP was employed by IMF (2007) in studying sufficient policy responses to a sudden increase in the amount of capital inflows. Also, EMP can be useful to the spectators to search opportunities for profit, and to the decision makers to prevent from other countries the spread of contagion because EMP is better in giving signal of tensions mounted more than the exchange rate variation.

The measurement of the EMP may serve as a guide to policy makers in making useful monetary policy. It may furnish useful information to both the public and private sectors regarding exchange rate, international reserve, level of income and interest rate that could influence the nature and degree of transactions. Secondly, the measurement of EMP could also provide information that could be useful to monitor monetary and financial policy domestically and internationally. In this case, information provided could be employed to study the growth in output, the economy external orientation, trade relationship, level of investment flows, exchange rate relation with financial and current accounts, level of transaction involving foreign banks, securitization of asset and the position of the country's foreign debt.

Economic Community of West African Countries (ECOWAS) with Nigeria as a member, declared to form Monetary Union (yet to be formed) in April, 2000. With this Union, monetary and exchange rate policies will be centrally determined and budget deficit to 4 per cent of GDP be maintained by member countries with central bank financing such deficit to 10 per cent of revenue realized year before (Paul & Catherine, 2001). Non compliance with such policy has important implications on some macroeconomic variables such as output, price level, money supply and balance of payment. Knowing these implications may likely provide an insight into the formulation and designation of appropriate fiscal policy in Nigeria. Furthermore, information on the potential effects of fiscal inappropriation in Nigeria (in the absence of strong set of fiscal rules within the union) could therefore be useful to other intending countries. This is because one important essence of establishing monetary union as soon as possible is to encourage enhancement in macroeconomic policies and to improve prospects for other areas of regional integration, regional trade inclusive (Paul & Catherine, 2001). A study by Beetsma and Jensen (2005) has expressed the role played by fiscal stabilization policy within the context of a monetary union. A common central bank implements monetary policy, but at the level of individual country, fiscal policy is conducted. It was emphasized that far from the efficient provision of public goods, fiscal policy performed stabilizing role.

1.4 Scope of the Research

The study pays emphasis on fiscal and monetary policy and their effects on the balance of payments (external imbalance) in Nigeria. Based on theory, particular attentions are paid to variables of interest such as Federal government expenditure and revenue, federal government fiscal deficit, inflationary rate, real broad money supply, domestic credit to private sectors, exchange market pressure, interest rate, exchange rate and foreign reserve. This is because these variables are capable of enabling the researcher to realize the stated objective of the research and above all to know the means by which the Nigerian economy absorbs external shock or exchange market pressure. The analysis covers the period 1970 to 2010 as this reflects the period of increasing government expenditure following the rising inflation and significant deficit in Nigeria. In particular, the descriptive analyses of data embarked upon in this study are limited to cover the period 1970 to 2009, and the econometric approaches to time series cover the period 1970 to 2010.

1.5 Methodology of the Study

The methods employed in this study are broadly divided into descriptive and econometric analyses. The essence of descriptive analysis is to facilitate econometric analysis stimulation. While the descriptive analysis deal with the fiscal, monetary and balance of payment developments in Nigeria, the econometric methods are concerned with the times series analyses. Four methods of econometric analyses of time-series data employed are the three-stage least squares (3SLS) method, the error correction mechanism (ECM) approach, bound tests approach for co-integration, otherwise called autoregressive distributed lag (ARDL) approach, and finally the dynamic ordinary least square method of Stocks and Watson (1993). Possible justifications for the adoption of the aforementioned methods could be provided.

Firstly, the study employs the three-stage least squares (3SLS) method to estimate the public sector (government expenditure and revenue) models in order to establish the fiscal deficit as linked to inflationary or price level. The use of three-stage least squares (3SLS) is considered desirable as it gives room for researcher to put into account all a-priori restriction intrinsic to the specification (Aghevli & Khan, 1978). The method makes necessary correction for the possible cross-equation autocorrelation and executes the estimation of the whole equations at once as a system instead of estimating them one after the other (Korsu, 2009). In the process of estimation, three stages least squares give the step three which permits non-zero covariance between the disturbance terms in the structural equations, thus making it to be more efficient asymptotically without neglecting any information regarding the error covariance as well as supplementary information which dependent variables of other equations could have (Brooks, 2008).

Secondly, the error correction model (ECM) is used in the determination of the association of macroeconomic variables to establish the effects of fiscal policy. This includes the estimation of money supply equation in order to examine their determinants. The employment of the ECM technique in this study is deemed appropriate and essential. For example, Brooks (2008) notes that ECM has long run solution and combines the use of first differenced and lagged levels of co-integrated variables to provide information regarding variables equilibrium relationship position and correct the past period disequilibrium of the system. Asteriou and Hall (2007) also point out that one, given the existence of co-integration between variables the error correction models are usually modelled with respect to first differences which get rid of trends from the variable included, in which case they neutralize the problems associated with spurious regressions. Two, ECMs make it easy to fit into general to specific approach to modelling of econometric which involves parsimonious ECM that fit the data sets appropriately. And lastly, the disequilibrium error term is a variable which is stationary as defined by co-integration. As a result of the fact that the two variables are co-integrated there exist some processes of adjustment which make it impossible for the errors in the long run relationship to increase in size.

Thirdly, autoregressive distributed lag (ARDL) approach of Perasan and Shin (1999), and Perasan, Shin and Smith (2001) for the bound testing of co-integration was applied and the Granger causality tests involving the estimation of a multivariate form of vector error correction model (VECM) within the context of ARDL framework was performed. The adoption of the approach is considered desirable because it provides opportunity to test whether or not there is long run association (co-integration) among the variables not minding whether the explanatory variables (regressors) are integrated of order 0 or 1. Therefore, there is no need to pre-test the variables and this lessens the task involved in deciding the order of integration. Furthermore, the method of bounds testing is advantageous in that it possesses better properties that accommodate small sample size more than the Engle and Granger (1987), and Johansen and Juselius (1990) procedure of co-integration (Narayan & Smyth, 2005). The approach of ARDL also gives room for different optimum lags to be assigned to variables which cannot be possible while using the conventional approaches to co-integration. In addition, the ARDL approach makes use of single reduced form equation as compared to the conventional approach of co-integration where estimation of long run associations is done within a system equation (Ozturk & Acaravci, 2010).

Fourthly, in order to estimate the monetary model of Exchange Market Pressure, the study employs the leads and lags regression method of Stock and Watson (1993), otherwise known as dynamic ordinary least squares (DOLS) regression. The leads and lags regression has the fundamental objective of obtaining efficient parameter estimates with normal distribution (Choi & Kurozumi, 2008). The DOLS has the main advantage of allowing for the inclusion of both variables with $I(0)$ and $I(1)$ in a system of equation.

This arrangement solves the problems associated with endogeneity and biasness associated with small sample, thus making the estimates to be robust (Stock & Watson, 1993).

1.6 Organization of the Study

In order to realize the objectives of the study the thesis is organized into six chapters. In chapter two, review of relevant literature is done, while the theoretical framework of analysis and the method used for the research are discussed in chapter three. Presented in chapter four are the analyses of budgetary developments and the profile of balance of payments in Nigeria. The penultimate chapter deals with the presentation, interpretation and analyses of the estimates results of the model. The last chapter gives the summary of the results, conclusion, policy recommendations, and the agenda for future research.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

Afonso and Sousa, (2009) has noted that in spite of many literatures on the consequences of monetary policy on the level of economic activity and the public debates on the role performed by fiscal policy, not much focus has been placed on fiscal policy worldwide, particularly in recognizing its significant role of economic stabilization. However, the global financial disorder and uncertainty in 2007 and 2008 has rekindled the interests and drawn the attentions of governments, central monetary authorities, and academia to the important role played by fiscal policy.

This study, therefore, explores the effects of fiscal policy on balance of payments, and in doing so, attempt is made to review literatures on the effects of government budgetary operations on the growth of domestic money supply and monetary base, inflation rates, interest rates, debt rates, and the balance of payments. The review can be grouped into three broad sections 2.1, 2.2, and 2.3. The concluding remarks are given in section 2.4.

Section 2.1 is concerned with the conceptual issues and definitions. Under this section, fiscal policy and government budget stance; analytical issues in the measurement of fiscal deficits; methods of financing budget deficit, and the need for fiscal management are dealt with in subsections 2.1.1, 2.1.2, 2.1.3 and 2.1.4, respectively. Section 2.2 discusses the theoretical literature. Under this section, the Aghevli and Khan Framework, the Keynesian theories of disequilibrium and adjustment, and the monetary theories of disequilibrium and adjustment are discussed in subsections 2.2.1, 2.2.2, and

2.2.3, respectively. The last section 2.3 involves the review of empirical studies on the economic implications of the government budget operations, and is grouped into three subsections. Subection 2.3.1 deals with the literature review on fiscal deficit, money supply and inflation and its subsection 2.3.1.1 evaluates the methods used in the studies reviewed. Subsection 2.3.2 deals with the review of literature on the relationship between fiscal deficit and current account balance while its subsection 2.3.2.1 evaluates the methods employed in the studies reviewed. In subsection 2.3.3, the literature review is done on the monetary approach to the overall balance of payment and the methods employed in the studies reviewed are evaluated in its subsection 2.3.2.1.

2.1 The Conceptual Issues and Definitions

Under this section, consideration is given to the definition of terms relating to fiscal policy and government budget stance; analytical issues in the measurement of fiscal deficits; methods of financing budget deficit, and the need for fiscal management in subsections 2.1.1, 2.1.2, 2.1.3 and 2.1.4, respectively.

2.1.1 Fiscal policy and government budget stance

Public sector influences the way resources are allocated and used in an economy through taxation, expenditure and borrowing activities to bring about economic stability and achieve the desired rate of economic growth. Thus, taxation, expenditure, and the financing of budgetary gap constitute the fiscal operations of government. According to McKay (2002), fiscal policy can be defined as covering the large various kinds of government spending and various methods of financing this public outlay. Fiscal policy in general comprises the variations in public expenditure and collections of revenue planned for the realization of non-inflationary domestic output (McConnell & Brue, 1999). The significant role played by fiscal policy in improving the level of economic activity as well as employment is still relevant to developing economies where mechanism is made less efficient by the structural rigidities (Fischer & Easterly, 1990).

The formulation and implementation of fiscal policies are done within the context of yearly budgets of government. According to Aborisade (2008), budget is a main financial plan of government. Such budget is expected to allow government to realize the key international objective of poverty reduction, by providing for the citizens essential services such as social amenities. These services are financed by progressive taxation in order to lower the existing levels of inequality. Frederick (2001) defines budget as a measurable and timely plan while Bruns and Waterhouse (1975) describes budget as the statements of financial plans which offer the ground for directing and assessing the performance of each organization or their segments.

Three types of budget are feasible. First, balanced budget stance, in which case, the total expenditure of government is equal to the total revenue generated within a period of time. This is appropriate for the economy that is approaching full employment but not a remedy for a depressed economy. However, government budget needs not balanced every year. Second is the budget surplus stance, where government revenue exceeds the expenditure over a period of time, mostly a year. This policy strategy is appropriate in an economy that has achieved full employment of resources and is threatened by inflationary pressures. And lastly, budget deficit stance is when the government expenditure exceeds its revenue. Planning for deficit is always aimed at boosting aggregate demand and economic growth.

Budget deficits have become an important issue for debate around the countries of the world in the area of public finance. Three major opposite views can be distinguished. Keynesian economics posited that through the multiplier, the influence of budget deficit on the macroeconomic activity is positive. In the context of endogenous growth models, if budget deficits are employed to offset expenditures that improve economic growth such as public infrastructure, research and development, education and health, then budget deficits can have the capacity of positive influence on long-term growth (Barro, 1990; Lucas, 1988; Romer, 1990). Neoclassical economists put up a contrary view by arguing that budget deficits compete with the private sectors and so affect the long-term economic growth negatively. Finally, the demonstration of Ricardian equivalence approach by Barro (1989) shows that change in budget deficit has no effect on the growth of economy. Due to these contrasting opinions, the employment of public expenditures for the enhancement of economic activity has not been encouraging. Recently, the conventional wisdom is of the view that deficits are not desirable due to their negative macroeconomic effects. This opinion serves as a guide to a country wishing to undertake sensible and careful fiscal policies for the purpose of decreasing deficits (Yaya, 2009).

2.1.2 Analytical issues in the measurement of fiscal deficits

The literature recognizes several dimensions of the fiscal deficit measure. The area of distinction is always between the convectional public sector borrowing requirement

(PSBR) definition of the fiscal deficit and that of the operational deficit. The use of the PSBR in countries with large domestic public debt and high inflation, in particular gave rise to the concept of operational deficit. Other measurements are the primary and structural deficit, and domestic budget balance. The various fiscal deficit measures have been developed to adjust for cyclical movements in the economy and to incorporate the effects of some economic variables. Particularly implicit in the analysis of the implications of deficit financing is the idea that one is able to obtain an acceptable measure of fiscal deficit. This is because there is no clear and perfect measure of fiscal deficit. Each of the measure has its shortcomings (Buiter, 1985, 1993; Raghbendra, 2001; Tanzi, 1993).

On annual basis, the customary overall deficit concept, and its primary, operational, and structural offshoots are measured, and never considered future year's development, even though the probability of expecting these developments is high. As emphasized by Heller (2003), the authorities will not consider the possible effect of other developments in the future, which are to some degree foreseeable. Different measurements of fiscal deficit have been considered. For example, one of them is the conventional measure of the fiscal deficit.

The conventional measure of the fiscal deficit states the difference between total government expenditure and current government revenue. Different countries record some variant of this deficit. This approach does have its difficulties. Tanzi (1993) for example, pointed out three difficulties: firstly, the conventional measure of the deficit does not consider it that categories of various tax and expenditure do have various kinds of impacts on aggregate demand. For example, excess spending on the infrastructure gives room for productive capacity and the effect will quite differ from an excess spending relating to consumption subsidies (See Gemmell, 2000; Hermes & Lensink, 2000). Secondly, problem arises because tax revenues are not exogenous of expenditures. The level of public expenditures determines national income, which then determines tax revenue, at least in part. Lastly, excess demand stemming from fiscal deficit depends not only on the size of the deficit but also on the manner in which it is financed. Authors such as Buiter (1985, 1993) has argued further that even after adjusting for cyclical and inflation, measure of deficit are not accurate indicators of true deficit. For example, the capital gains/losses on government assets and liabilities are not included in the conventional flow of funds accounts. Examples of these would include changes in relative prices (e.g., changes in mineral prices) and changes in the real value of nominal debt during the period of inflation.

Two, operational measure of deficit: This is the convectional deficit minus that part of the debt service that compensates debt holders for actual inflation. When inflation is high, a large share of interest payments represents amortization of public debt because it compensates bond holders for the erosion of the value of their assets. The exclusion of these amortization components together with interest expenditure implies that the convectional measure of fiscal deficit overstates the size of the true fiscal balance. Thus, the operational deficit adjusts for these payments. However, measurement problem arises in the sense that it is difficult to estimate expected inflation. In addition, fiscal deficit itself may affect inflation, and the automatic roll over of the inflation component of interest payment cannot be guaranteed. Thus, operational deficit seems to be a lower-bound estimate of the government deficit in high-inflation countries as it does not take into account these risks. According to Mario and Adrienne (1990), there can be different inflation elasticity for different components of revenue and expenditure. This brings up important problems which have adversely affected the budgets development in real terms. A well acceptable method to get a fully inflation-adjusted deficit is yet to be gotten.

Three, primary deficit measure: this excludes interest payments from the convectional measure in order to obtain a measure of the current policy stance. The current interest payments reflect past policy decisions rather than present policy. They are predetermined by the size of the previous deficits. Therefore, in order to evaluate current policy, interest payments are excluded in the deficit measure. This measure has been widely used, particularly in countries experiencing debt over-hang. However, the extent of discretion of government cannot be appropriately recognized. Benefit payment by government like unemployment benefits and the wage bill of the public sector are likely been predetermined. The primary deficit (or "non interest deficit") deals with the measurement of the discretionary budgetary stance by setting a zero weight to net interest payments in the budget. To calculate the primary deficit, total interest payment is subtracted from government expenditure. However, what is expected to be removed is only the net interest paid by government conceptually (Mario & Andrienne, 1990).

Four, structural deficit measure: this is the balance between the total government expenditure and ordinary revenue, in a case where the economy is neither in a recession nor a boom period. Thus, this measure presents the deficit adjusted for fluctuations in business cycle. It also takes account of the factors that might cause deviation from the 'normal' trend level of the government expenditure and revenue. While in theory the structural deficit is clear-cut, in practice it is often difficult to calculate. The definition that is often employed is the one outlined in the International Monetary Fund's draft manual on the government finance statistics. This measure leans more on the concept of an actual deficit. For simplicity, revenue and grants are summed up on one hand, and the expenditure on goods and services, transfer payments and net lending are summed up on the other. The difference between the two summations accounts for the fiscal deficit. In the alternative, fiscal deficit can also be calculated as the summation of borrowing and net decrease in cash holding minus amortization (Raghbendra, 2001).

Five, Government Domestic Budget Balance: this is more relevant measure of the budget balance for oil-exporting countries where substantial volume of external receipts and payments passes directly through the government's budget (See Morgan, 1979). In the absence of overall budget deficit, government budgetary policy could still exert strong impact on the domestic economy. In actual fact, the extent to which income from oil is injected into the economy depends on the domestic budget balance. Therefore, when government implements balanced budget policy, there can still be a high rate of monetary expansion due to government foreign revenues from crude oil. Such foreign exchange earnings do not reduce disposable income and their domestic spending leads to money creation. Hence, the contribution of government budget policy to domestic monetary expansion is best measured by government's domestic deficit, defined as the difference between the domestic expenditure and domestic revenue (Morgan, 1979). The overall budget balance is the difference between total expenditure (domestic and foreign) and total revenue (domestic and foreign).

In oil exporting nations having a nationalized petroleum industry, most of the applications of the measures of domestic deficit have been executed. Mario and Adrienne (1990) argue that the use of revenue from oil to finance spending will lead to monetary expansion unless the monetary rffect is completely dealt with. Such expansion may not be suggested by the conventional measure of the budget deficit. In the same vein, there could be expansions with large foreign grants. However, Raghbendra (2001) states that the problems associated with the measurement and interpretation of the deficit do not matter, but it is important to get it clear whether there is sustainability in the underlying fiscal stance.

2.1.3 Methods of financing budget deficit

Fiscal deficits can be financed either by borrowing or by drawing down foreign reserves. Borrowing can be from foreigners (public or private), domestic lenders (non-bank), commercial banks or Central bank (domestic credit creation through the banking system). Each of these methods has effect on macroeconomic variables. These methods are examined in turns:

One, Money Creation: Money is created when the banking system purchases newly issued public debt. When fiscal deficits are financed through money creation, there will be direct expansion of the money supply if the borrowing is made from the Central bank. On the other hand, if it is made from the deposit money banks, the expansion of money supply will be indirect. Therefore, with the expansion of the monetary base there is consequence of inflationary pressures. The central bank is forced to increase its issuance of money following an increase in spending due to increasing inflation which leads to a seigniorage. In macroeconomic theory, any government pursuing constant deficits will offset the deficits with the creation of money (seigniorage) either now or later with the consequence of generating inflation (Sargent & Wallace, 1981). In recent time, Fischer, Sahay and Vegh (2002) employ fixed effects in a panel of 94 developing and developed economies, and point out that fiscal deficit brings about high inflations. However, it is in addition discovered that variations in budget balances do not have significant inflationary impacts in countries with low-inflation, or at the period of low inflation in countries known with high-inflation. One study (Little, Cooper, Max Corden, & Rajapatirana, 1993) has shown that most domestic finance of developing countries comes from the banking system. On average, about half of budget deficits in developing countries are financed in this way.

Two, Foreign Exchange Reserves: this involves the use of a country's accumulated foreign exchange reserves to finance government budget deficit. If the choice of financing deficits is to run down reserves rather than to print money, the authorities can prevent the occurrence of the inflationary effects of deficit. However, such policy leads to exchange rate appreciation. Several trials have sometimes been made to implement the policy of reducing depreciation of exchange rate with the aim of bringing down inflation rate but it is unsustainable except fiscal policy and inflation decrease are made compatible (Fisher & Easterly, 1990). Deficit also has the effect of crowding out net exports of goods and services through a real appreciation of the exchange rate, thereby weakening the current account of the balance of payments and increasing the external debt (Gallaway & Vedder, 1998).

Three, Domestic Borrowing: this method of financing budget deficit is domestic debt creation. As public buy new supply of government securities it creates domestic public debt. Fiscal deficit could also be financed domestically when government offers the sales of its bonds to banking system or public. Where financial system is not advanced or capital market is not stable, the sale of bonds to the public may result in excess supply of bonds in that economy (Fischer & Easterly, 1990). Government domestic borrowing reduces the credit that would otherwise be available to the private sector and making the domestic interest rates to be high. Where interest rates are regulated, domestic debt causes the rationing of available credit such that it crowd out private investment (Gallaway & Vedder, 1998). Furthermore, it is argued that economic growth is slow down or prevented when government resorts to higher taxes or borrow more to finance its increased spending. This is because they play a disincentives role for the private individual to take risks and invest (Vera, Simon & Edmond, 2008). Borrowing can also be detrimental to private investment by crowding it out because available funds which could have been meant for private sector investment are accessed by government (Gallaway & Vedder, 1998).

Four, External Borrowing: government could also borrow from abroad to finance fiscal deficit. This could be in the form of direct borrowing from abroad by the government treasury or by public enterprises. It could as well be in form of concessionary loans and foreign grants. If a country can finance its fiscal deficit through these sources, the deficit may not have adverse effects on the economy, provided that the fund is productively used. According to Heller (2003), there is not much economic evidence that debt cannot be used to finance investment as far as such investment is well chosen. The net worth of such investment will not be affected and the costs incurred in financing it would be spread across different generations who benefit from it (Heller, 2003). However, the experiences of developing countries have been that foreign loans are rarely used productively. Most developing countries often find it difficult to service the borrowed funds. For example, Nigeria cannot tolerate debt just as the other emerging markets cannot and so, are unable to manage certain debt which advanced industrial nations can manage (Eichengreen, Hausmann, & Panizza, 2003). Excessive reliance on external borrowing to finance budget deficit can also lead to debt and debt servicing problems. In turn, debt crisis can worsen government fiscal deficits. Fischer and Easterly (1990) found that nations which developed problems in servicing their debt would have large public deficit. Accordingly, those countries with large debt over borrowed and the belief that they have no credit worthiness has constrained their finance. In actual fact, high debt stocks relative to government expenditure reduce the flow of financing, both internal and external for the investment purpose.

2.1.4 The need for fiscal management

The Nigerian governments at different levels have still been striving hard to inculcate the idea of fiscal discipline. In the macroeconomic management, the most frequent issue is that of fiscal dominance by government such that deficits are often financed through the central bank. Such financing makes monetary base to increase with negative effect on inflation and stability of exchange rate. Also, the interest rate will rise with increase in the level of inflation to the extent of dampening investment (Fischer et al., 2002). Hence, there is a need for fiscal management.

Fiscal management is the economic dimensions of the institution which perform the main role of economic collection of revenue, economic planning for spending and economic monitoring and assessment of the activities. Many countries have put in place several strategies to pursue fiscal policy, realize balance and foreseeable fiscal policy. These ranges from fiscal discipline at all levels of governments; debt targets or public debt curtail to reduce deficit in the future; balanced-budget program; and spending assessment programs. The essence of these is to facilitate transparent and long time focus on budgeting. Daniel, Ricardo and Fernando (2003) point out that there should be transparency in preparing fiscal accounts, projections and estimates as well as when presenting budgets and fiscal reports. This is because it reduces the level of uncertainties, exaggeration and fear that government will act in a way that will not be consistent.

One generally acceptable objective of policy is fiscal restraint and it is executed using the common tool known as deficit ceilings. The ceiling prevents an excessive government debt, forces government to increase taxes or curtail spending such as on public investment and thus, protects capital stock. Fiscal prudence is important because of the concern that deficit deters private investment and net export; it also causes government debt to rise. However, Ali Abbas, Jacques, Antonio, Mauro, and Ricardo (2010) have argued that a tight fiscal policy can lower interest rates, even on external debt, thereby improving the current account balance. At the same time, lower interest rate can induce increase capital inflows, which increase demand, appreciate exchange rate and eventually worsen the current account balance. Conversely, fiscal expansions that are deemed unsustainable can generate capital flight and force a rapid external account adjustment. This is the case of balance of payments crises generated from a wasteful expenditure or revenue.

Fiscal viability ensures the sustenance of economic development while good governance does not only reduce waste but also ensures that available resources are efficiently used. Both factors have direct impact on investment decision and economic growth. Thus, there is a need for enhanced fiscal viability and efficient fiscal operations through effective revenue collection, transparency and accountability. Also, good governance, which encompasses political stability, rule of law and control, is an essential attribute that propel the economy forward (Aborisade, 2008). It is because of the desire to achieve these objectives that the federal government submitted a bill on fiscal responsibility to the Nigeria National Assembly (CBN, 2009).

2.2 Review of Relevant Theoretical Literature

Under this section, review of literature is done on the Aghevli and Khan Framework in subsection 2.2.1 and the two competing theories of balance of payments, which are the Keynesian and monetary theories of disequilibrium and adjustment are reviewed in subsections 2.2.2 and 2.2.3, respectively. The Keynesian theory consists of elasticity and absorption approach to balance of payments.

2.2.1 The Aghevli and Khan framework

The analyses of inflation by the monetarist have taken cue from the basic work of Cagan (1986) on hyperinflation in which it was emphasized that deficit would be the outcome of increase government expenditure exceeding revenue and thus be responsible for the cause of inflation. The model developed by Cagan, therefore, suggested a unidirectional causation from deficit to inflation. On the other hand, the model that provided the bilateral causation between the developments of inflation and government deficits was developed by Aghevli and Khan (1977, 1978). In this case, the lags in government revenue in relation to increased government expenditure would result in government deficit and this deficit would essentially be caused by inflation. In other word, inflation brings about large fiscal deficits and these deficits are financed with the use of central bank credits which subsequently makes the supply of money to rise. As a result, the domestic price level in turn increases further. The idea is that inflation causes the nominal income to increase and as such, government expenditure adjusts to the increase. Even though government considers it necessary to curtail spending in the course of inflation, it may not reduce its previous commitments in real terms. The basic hypothesis put forward by Aghevli and Khan (1978) is that government expenditure would adjust faster to its desired level than government revenue, with the coefficient of adjustment of the former greater than the coefficient of adjustment of the latter. This is due to institutional factors, and it results in public sector deficits. In conclusion, the Aghevli and Khan (1978) models have been applied to different developing countries (Nigeria not inclusive) following the proposition by the authors that the model originally designed for hyperinflation countries can as well be appropriately applied to moderate inflationary countries. Nigeria is a moderate inflationary country and this model is considered appropriate to be applied to its data. Since the proposition has not been tested in Nigeria before by any study, this study employs the model to Nigeria data to test the hypothesis as done in other developing countries.

2.2.2 The Keynesian theories of disequilibrium and adjustment

In the literature, on the effects of fiscal policy on the economy, one of the two competing theories of balance of payments is the Keynesian theories of disequilibrium and adjustment. The Keynesian approaches are classified into 'elasticity theories' and 'absorption theories' of balance of trade and payments.

The elasticity approach has been credited to Robinson (1937). The approach explains the way devaluations of exchange rate and price level will influence the balance of trade based on the elasticity of supply and demand for foreign exchange and foreign goods. Accordingly, there are four forms of elasticity upon which devaluation depends to be effective on the trade balance. These are: demand elasticity for exports at foreign level; and the supply elasticity for exports domestically; supply elasticity of imports at foreign level; and the demand elasticity for imports domestically. The elasticity condition for the impact of a devaluation to improve the trade balance is that the sum of the demand (imports and exports) elasticity exceeds unity. This has been termed the Marshall-Lerner condition (Ardalan, 2003). The theory of elasticity leads to what is called the "J-curve effect", which shows the short-run and long-run effect of devaluation on balance of trade.

The absorption approach was first presented by Alexander (1952). Its focuses on the balance of trade from the national income accounting point of view. An improvement in the balance of trade necessitates an increase in production relative to absorption. That is, the core of this approach is that any improvement in the current account balance requires an increase in income over total domestic expenditure. Therefore, higher domestic absorption can weaken the current account balance. According to the Keynesian absorption theory, an increase in budget deficit increases domestic absorption and import. Thus, the current account goes into deficit from an initial equilibrium position. The absorption approach to the balance of trade is a theory that emphasizes how domestic spending on domestic goods changes relative to domestic output. In other words, the balance of trade is viewed as the difference between what the economy produces and what it takes for domestic use or absorbs. However, these theories of balance of payments can be viewed in a world where there is no capital flows (Ahmed, Seyed, & Khosro, 2009). The absorption approach is considered to have improved upon the elasticity approach because it views the external balance via national income accounting. In this manner, the approach associates the balance to the happenings in the rest of the economy rather than taking the partial equilibrium view of the elasticity approach where external sector is explain in isolation (Ardalan, 2003).

2.2.3 The monetary theories of disequilibrium and adjustment

The second competing theory of balance of payments in the literature is the monetary theories of disequilibrium and adjustment. The theoretical analysis of the monetary approach emanated from Dornbush (1973), Johnson (1977), and Mundell (1968) among others, even though some of the main ideas were noted by David Hume (1752). The monetary approach to balance of payment, which regards the balance of payments as a 'monetary phenomenon' expresses the relationship between a country's balance of payments and its money supply (Chacholiades, 1990). According to the approach, there is disequilibrium in the money market if there are surpluses or deficits in the balance of payments. Deficits are caused by money supply exceeding money demand, while surpluses are caused by money demand exceeding money supply (Howard & Mamingi, 2002). In this approach, real value of nominal assets, money and international debt are regarded as been determined by general price level while relative prices are considered to have only a transitory effect on the balance of payment.

The monetary approach to balance of payments postulates that the overall balance of payments measured by international reserves is influenced by imbalances prevailing in the money market. When there is excess supply of money in the economy, domestic expenditures for import goods and services will increase. These expenditures are financed by running down foreign exchange reserve thereby worsening the balance of payments. This is the case where the exchange rate is fixed. The outflow of foreign reserves continues until money supply is reduced to the point where it is equal to money demand (equilibrium position). Conversely an excess demand for money leads to an opposite adjustment. The monetary approach, like the absorption approach, stresses the need for reducing domestic spending relative to income in order to do away with the deficit in the balance of payments. However, whereas the absorption approach looks at the relationship between real output and spending on goods, the monetary approach is concerned with shortfall or excess demand for goods and securities, with corresponding excess or non excess money. The monetary approach looks at the balance of payments as the variation in the high powered money less the variation in what the domestic economy is made up (Ardalan, 2003).

The analysis of the theory for the effects of budget deficit on the external sector can be traced back to the Mundell-Fleming model (Fleming, 1962; Mundell, 1963). The model postulates that an increase in budget deficit tends to increase consumer disposable income and hence increases the domestic consumption of both the domestically produced goods and the imported goods. An increase in the import demand tends to depreciate the exchange rate. The exchange rate depreciation in turn increases the demand for export. Since both import and export increase, the net effect on the trade balance is not certain. The Keynesian absorption theory is in contrast to this inconclusive prediction of the Mundell-Fleming model.

The theory has also offer analysis for the Twin Deficit Hypothesis which depends on Mundell-Fleming framework. According to the theory, an increase in budget deficit causes the domestic rates of interest to rise, and the increased interest rate attracts the capital inflows. This brings about an excess of foreign exchange to purchase domestic assets which in turn causes domestic currency appreciation. The appreciation of domestic currency discourages exports and hence an increase in current account deficit. Capital mobility has influences on the degree of responsiveness of domestic investment and current account deficit. Where capital is highly mobile, domestic rate of interest will not change in response to fiscal change. Therefore, there will not be crowding-out effect on domestic investment as foreign capital will quickly offset the fall in domestic investment. The conventional Mundell-Fleming model suggests a positive relationship between the two deficits (current account and budget deficit). Like the Mundell-Fleming model, the Keynesian absorption model also suggests that the causal relationship between the two variable runs from budget deficit to current account deficit and not the other way round.

At the other end is the debate about Ricardian Equivalence Hypothesis. The Ricardian Equivalence Hypothesis put forward by Barro (1989) suggests that the public expect future increase in taxes to compensate recent government excess spending. Therefore, households reduce their consumption spending now and raise saving to smooth out the expected reduction in their future disposable income when government eventually taxes them. This implies that deficit and taxes are equivalent in their effect on consumption, investment and hence current account. Thus, the Ricardian equivalence implies that fiscal deficit has no effect on the external sector. Furthermore, a uni-directional causality that may run from current account to budget deficits may also exist. Perhaps this reverse causation could be a result of the deterioration in current account leading to lower economic growth and this could require large injection of public fund for improvement, thus causing increase in the budget deficit. This causal pattern may be more relevant to the developing countries that have accumulated large foreign debts. The reverse causation of this type is likely to occur if government utilizes its fiscal stance to target the current account. The above arguments show that there are many contrary views on the twin deficits relationship that are yet to be resolved.

At later time, a more comprehensive general equilibrium framework based on inter temporal optimization has been developed. This approach concentrates on the role played by private agents in saving and investment decisions. It analyzes whether present generations expand their budget constraint by taxing future generations via government budget deficit, which in turn creates deficit in the current account. This is the framework adopted by Bartoil (1989). However, market imperfections make it difficult to apply the optimizing framework in less developed countries. Such general problems are compounded by scarcity of data.

Exchange Market Pressure (EMP) model was developed and introduced by Girton and Roper (1977). During the time of Bretton Woods's system, exchange rates were maintained fixed by the member countries and most authors concentrated on examining the determinants of balance of payments. This was formally known as monetary approach to the theory of balance of payment. Following the collapse of the Bretton Woods in 1971, floating exchange rate system was been practiced and researchers directed their focus to the monetary approach to exchange rates determination to analyze the impacts of money market disequilibrium on the exchange rate (Frenkel, 1976). In another development, Girton and Roper (1977) came up with the new monetary model based on a monetary approach to the Balance of payments and a monetary approach to exchange rates to analyze EMP. Girton and Roper define EMP as the endogenous variable of net foreign assets or international reserves and variations in exchange rates which take control of the pressure mounted by excess increase in the supply of money more than it is required for demand, given a freely or managed floating exchange system. The fundamental hypothetical theory states that given up foreign reserve and devaluation of exchange rate are the remedy for any excessive money supply in the economy while excessive money demand requires building up foreign reserve and exchange rate appreciation for its normalization. Where managed flexible exchange rate is in operation, the two aforementioned requirements for remedy can be combined.

From the review of the theoretical literature above concerning the monetary approach to balance of payment, this study considers Exchange Market Pressure (EMP) model suitable for Nigeria since it is a small open economy which is subject to world given prices and monetary conditions to be taken. Also the Nigerian economy has been frequently confronted with pressure been exerted on its international reserves and exchange rates due to its freely floating system. In spite of these facts, this EMP model has not been applied to Nigerian data to test the model proposition. This study therefore chooses to employ the EMP model on Nigerian data, for Nigeria's experience will serve as contribution to literature in this field. Paying attention to EMP instead of emphasizing the amount of exchange rate variation is in practice relevant, for 82% of the currencies in the world are being either fixed, freely float or managed float (IMF, 2009). An EMP was developed and used to cover a broad range of exchange rate systems, from fix to floating to manage float. Since the theories of exchange rate and balance of payment significantly pay attention to tensions mounted in the market for foreign exchange, EMP has the capability of integrating the two theories. Furthermore, EMP as compared to exchange rates variation can have more relevance in determining other phenomena. For example, EMP was employed by IMF (2007) to study sufficient policy responses to a sudden increase in the amount of capital inflows. Also, EMP can be useful to the spectators to search opportunities for profit, and to the decision makers to prevent from other countries the spread of contagion because EMP is better in giving signal of tensions mounted more than the exchange rate variation.

2.3 Literature Review on the Relevant Empirical Studies

The review of literature on empirical studies is grouped into three sections. Section 2.3.1 deals with the literature review on fiscal deficit, money supply and inflation while section 2.3.2 is concerned with the literature on the relationship between fiscal deficit and current account balance. In section 2.3.3, the literature review is done on the monetary approach to the overall balance of payment. The evaluation of methods used in the studies reviewed is done in subsection 2.3.1.1, 2.3.2.1 and 2.3.3.1.

2.3.1 Literature on fiscal deficit, money supply and inflation

The analyses of inflation by the monetarist have taken cue from the basic work of Cagan (1956) on hyperinflation in Austria, Germany, Russia, Greece, Poland, and Hungary where it was emphasized that deficit would be the outcome of government expenditure exceeding its revenue and thus be responsible for the cause of inflation. The studies of the association of government fiscal deficit with inflation have been conducted in developed countries. For example, in United States of America, Ahking and Miller (1985) investigate how the public fiscal deficit, growth of monetary base, and inflation affect one another in an autoregressive form and their findings show that inflation and public fiscal deficit are independent for the period 1960s. However, inflation, increase in monetary base, and public fiscal deficits have inflationary causal relationships for the period 1950s and 1970s.

Cacy (1975) employs ordinary least square to investigate how the budget deficit is related to the money supply (M1 and M2) using annual data of United States over the period covering 1955-74. It is concluded that fiscal deficit is negatively and positively related to M1 (which composes currency plus demand deposits in the hand of public) and M2 (which composes M1 plus time deposits), respectively.

Another study by Giannaros and Kolluri (1985) investigate the hypotheses of monetarist in respect of how the money growth and inflation are affected by fiscal deficits for ten industrialized countries by using the growth of money supply equation, and inflation equation econometric models. The results of the least squares regression show that generally, increase in money supply and inflation are not determined by fiscal deficit. In the case of United States, the negative sign expected is observed while in Belgium and Japan, the money supply is found to be negatively related to deficit spending.

Loungani and Swagel (2001) investigate the correlation among the money growth, inflation, and fiscal deficit by employing VAR techniques and pool annual data covering the period 1964 to 1998 for 53 developng countries. Results indicate that in the long run, the correlation of money growth with inflation is very strong for all samples but stronger in countries with high inflation than countries with low inflation. Fiscal deficit is found to have strong negative correlation with the money growth especially in countries where the average inflation rates are high such as Mediterranean region.

In the work of King and Plosser (1985), the factors influencing inflation in 12 countries including the United States are examined by employing ordinary least square and vector auto-regression. Findings show that in general terms, there is no significant causality flowing to monetary base and inflation from government fiscal deficit. A study by

Burdekin and Wohar (1990) employs Granger causality method to investigate the causal-effects of the government fiscal deficits which are monetized and the government fiscal deficit which are not monetized on both inflation and output in United States over the period 1923 to 1982. Granger causality tests' results indicate that the growth of nominal or real gross national product and inflation are not influenced by the increase in deficit and monetization during the year 1923 to 1960. However, deficits that are not monetized affect inflation negatively in the short-run during the year 1961 to1982.

In another study by Catao and Terrones (2005), the influence of public fiscal deficits on the rate of inflation is examined over the period 1960 to 2001 in 107 countries including developed and developing countries. The study models inflation in relation to public fiscal deficit in a non linear form and uses panel regression method of estimation. Findings indicate that developing countries with high inflation are characterized with positive relation of fiscal deficits with inflation but not in advanced countries with low inflation. The study conducted by Fischer et al. (2002) investigates the phenomenon of fiscal deficit's influence on inflation in 94 developed and developing countries by employing panel regression method of estimation over the period 1960-1995. Findings reveal that government fiscal deficits cause inflation to rise excessively. Results further show that an improvement in fiscal balance greatly causes inflation to fall and as the fiscal balance deteriorates, inflation increases sharply.

In developing countries, many empirical studies have also been carried out to determine the impact of government fiscal deficits on inflation. For example, over the period 1973 to 1988, Choudhary and Parai (1991) examine the influence of government budget deficit on inflation in Peru using a rational-expectations macro model of inflation, and find that government budget deficit and growth rate of money supply affect inflation significantly. In a study of Ghana's experience, Sowa (1994) employs error-correction mechanism to examine the factors influencing inflation over the period 1985 to1989 and finds that in the short run and long run, volatility of output plays important role in influencing inflation more than monetary factors. It was suggested that government should focus on supply factors and be consistent in pursuing fiscal policies to minimized Ghana's inflation. In Greece, Dogas (1992) investigates the effect of public fiscal deficit using a post-Keynesian inflation model and two stages least square over the period 1963 to 1988. It is found that public deficit has considerable impacts on the country's inflation. Also, in Greece, Hondroyiannis and Papapetrou (1994) examine the long run relationship, and direction of causality between public budget and inflation. They find that co-integration exists between the price level and public budget and the direction of causality between the variables is bidirectional.

Study by Metin (1995) investigates Turkey's experience of inflation over the period 1950-1988 by employing Johansen co-integration and error correction mechanism. Results indicate that fiscal expansion plays essential role in affecting inflation. It is also reported that in the short run, inflation is positively affected by excess money demand and for this reason it is suggested that by disallowing fiscal deficit, inflation in Turkey is likely to be lessened. In another study over the period 1952-1987 on Turkey by Metin (1998) relating to government deficit and inflation, it is found that inflation quickly accrues as a consequence of rising government fiscal deficit while the growth of real income negatively influences inflation and its lagged two value has positive impact on inflation. Also it is reported that when government deficit is monetized, inflation is positively impacted by deficit.

Study conducted by Habibullah, Cheah and Baharom (2011) investigates the phenomenon of government fiscal deficit and inflation relationship in 13 developing countries of Asia over the fiscal years 1950 to 1999. Using the method of Engle and Granger co-integration and error-correction mechanism, findings show that there is a long run association between public fiscal deficit and inflation. It is concluded that inflationary trends in Asian countries are results of government fiscal deficits.

In Nigeria, a large body of work has been done around the issues associated with behavioural nature of fiscal phenomenon and some of the effects associated with it, particularly inflation. The literature review provides an insight into the questions that have drawn the researchers' focus. For example, Oyejide (1972) put interest in investigating the budget deficit pattern over the period 1957-1970. The study examines the consequences of this deficit on domestic liquidity, inflation and capital formation. It was found that the measure of financing the Nigerian deficit was directly related with the general price level. Another study, Onwioduokit (1999) examines the direction causality runs between budget deficits and the general price level over the period 1970-1994. The results of the Granger causality indicate that fiscal deficit granger-causes inflation without any feed back from inflation except for the fiscal deficit to GDP ratio. It was suggested that government should embark on policies that will boost productive capacity in order to dampen the effect of inflation in the economy. Study by Ndebbio (1998) examines fiscal deficit and inflationary process in Nigeria from the period 1970 to 1992 by employing two stages least squares estimation and Simulation methods. It was reported that large fiscal deficit greatly causes a rise in inflation as well as an increase in imports through money supply.

In the work of Adam and Bankole (2000) it is asserted that financing of public deficit by monetary means is likely to have motivated a sharp rise in money supply and a speedy increase in inflation. A study by Olubusoye and Oyaromade (2008) examines the fundamental factors influencing variation in inflation in Nigeria over the period 1970 to 2003 by employing error correction mechanism. Results confirm that the lagged price level, expected inflation, prices of petroleum and real rate of exchange have significant influence on the process of inflation in the country. However, it is further reported that output level has no significant influence while the parameter estimate of lagged money supply turns to be significantly negative in influencing Nigerian inflation.

More recently, Akinbobola (2012) analyzes the dynamics relationship among the supply of money, rate of exchange and level of inflation by employing Vector Error Correction Mechanism in Nigeria over 1986-2008. Findings show that inflation is significantly and negatively influenced by money supply and rate of exchange in the long run. It is reported also that growth of real output and variation in international price directly affect inflation. Another study by Chimobi and Igwe (2010) uses Johansen co-integration test, vector error correction mechanism and Granger causality to investigate the long run association of fiscal deficit with the growth of money and price level in Nigeria over the period 1970 to 2005. They find that there is a long run association between inflation and money supply, and the fiscal deficit is positively related with money supply. In the long run, bilateral causation exists between inflation and fiscal deficit, and unidirectional causality runs from money supply to inflation.

Similarly, Oladipo and Akinbobola (2011) examine the Granger causality between the government fiscal deficit and inflation in Nigeria over 1970 to 2005. The causality results show that the flow of causality is from government fiscal deficit to inflation without any feedback from inflation. However, in examining the connection between fiscal deficit and inflation in Nigeria, Olusoji and Oderinde (2011) find no clear cut proof of causation between fiscal deficit and inflation. They suggest that other factors apart from fiscal deficit should be focused to achieve inflation control especially in the method of financing the fiscal deficit. In conclusion, observations have shown that most of the studies conducted in both developed and developing countries on the association of the government fiscal deficit and inflation have provided mixed and conflicting results in both short run and long run. Therefore, the validity of the results remains inconclusive and more studies are needed in this area.

Studies have provided evidence of the effect of inflation on the government deficit and through its financing leads to increase in money supply with further increase in inflation. For instance, Aghevli and Khan (1977a) investigate these developments so as to analyze the case of high inflation in Indonesia over the period 1951-1972. The study employs full information maximum likelihood, simultaneous and simulation techniques to estimate a dynamic model of inflation formulated on the basis of the notion that government expenditure is caused to increase by inflation rate more than an increase in government revenue. This has the consequence of raising fiscal deficit which in turns put more pressure on inflation to increase further. It is reported that the rising money supply is a consequence of rising inflation which induces government expenditure to increase relative to its revenue.

Another study by Dutton (1971) analyzes the level of variation in the price level with respect to government deficit in Argentina over the period 1958 to 1966 using two stages least square method of estimation. The model consists of percentage variation in price level, money stock, monetary base and deficit expenditure. Deficit is argued to be a result of lag in adjustment of revenue (due to institutional factors) to price increase as relative to a faster adjustment of government expenditure to price level. Therefore, a rising price level during the period leads to a rising nominal government deficit and this increases the money supply.

In another development, Aghevli and Khan (1978) developed model was applied to four developing countries with moderate inflation rates namely, Columbia, Dominican Republic, Brazil and Thailand. The results of their econometric estimates for these countries support their hypothesis that government expenditure would adjust faster to its desired level than government revenue in response to variation in the level of price, due to institutional factors with the consequence of public sector deficits. Therefore, the model was proposed to be applicable to developing countries with moderate inflation despite the fact that the model was originally designed for, and applied in high inflation countries.

For 24 developing countries, Heller (1980) examined the consequences of inflation on fiscal policy over the period 1972-1978 in order to test the applicability and validity of the model developed by Aghevli and Khan (1978). He found that 13 developing countries examined agreed with Aghevli and Khan's finding while the 11 remaining developing countries failed to comply. The results signified that the model could still be applied further to other developing countries before conclusive results could be drawn.

To test the model and its proposition further, Kilindo (1997) examined fiscal operations, money supply and inflation in Tanzania by applying Aghevli and Khan (1978) developed model. It was found that government expenditure exceeded the revenue realized from taxes during the time the price levels are increasing and this consequently led to deficits. In this case, Kilindo's results were paralleled to the findings of Aghevli and Khan (1977a, 1978). However, Kilindo's results of the relative speeds of adjustment for the time beyond 1984 disagreed with Aghevli and Khan's findings when the role of price expectation was included in the model.

The foregoing suggests that on the application of Aghevli and Khan (1978) models the results obtained have not been conclusive and the models still need to be tested further in other developing countries (Heller, 1980). Therefore, the current study applies these models which have been applied to some developing countries (Nigeria not inclusive) to Nigeria data to test the proposition. In addition, the current study provides the connection of the central government deficit stimulus to inflation and estimate the government spending and revenue lags upon which the connection hinges rather than imposing it on a priori basis. By doing so this study departs from the previous studies conducted in Nigeria in this field.

The causality relationship existing between money and inflation has been examined by previous studies. For example, Sergent and Wallace (1973) investigate the causal association between money and price level for Austria, Germany, Russia, Greece, Poland, and Hungary and find that the causation runs from money to prices and vice versa. The stimulus of money supply to inflation was attributed to the fiscal behaviour of the government. This was a case in which government utilized real resources more rapidly than it could be maintained in the face of inflation and therefore made the money supply to rise with further consequence on inflation. Study by Khan and Siddiqui (1990) also found bidirectional association between broad money and consumer price index for Pakistan data by employing Sims (1972) causality method over the fiscal year 1972 to 1981. Similarly, in the work of Bengali, Khan, and Sadaqat (1997), bidirectional causality was also reported between money (measured by combining broad and narrow money) and consumer price index for Pakistan over the quarterly data covering the period 1972 to1990.

In contrast to the above studies which reported bidirectional causality between money and price level, other studies have found unidirectional causality between the two variables. For example, Brillembourg and Khan (1979) investigate the causal association between money and inflation in United States using Sims and pierce causality approach over the period 1870 to 1975 and find that money causes price level in the short run without a feedback. This implies that a unidirectional causality exists between the two variables. Chaudhary and Ahmad (1995) employ the method of least square for the estimation of the simultaneous models involving broad money supply, price, money demand, and output for Pakistan over the periods 1973–92, 1973–82, and 1982–92. Findings reveal that output effect on price is negatively significant while money supply and imports price positively affect the price level.

Another study by Beltas and Jones (1993) employs Granger causality approach to examine the causality between money and inflation in Algeria over the period covering 1970 to 1988. Findings show that money causes inflation in the short run without a feedback from inflation, which suggests a unidirectional causality between them. On the contrary, Akhtar (2005) find the effect of inflation on the money supply to be significant and the level of inflation strongly Granger-causes the increase in narrow money supply over the period of the study. Similarly, Hoover (1991) investigates the causal relation between money, prices and interest rate in United States over the period 1950 to 1985 using a recursive model and OLS method. Findings show that money is caused by prices, but money supply does not cause prices. Based on the mixed and conflicting results reported for the short run and long run causality relationship between money and price level, the results appear to be inconclusive. For this reason, more studies are necessary in this field.

Other studies relating to the determination of factors influencing inflation have also been reported in some African countries. For example, Imimole and Enoma (2011) utilize autoregressive distributed lag (ARDL) bound co-integration approach and error correction mechanism to investigate the influence of exchange rate depreciation on

Nigerian inflationary trend over the period 1986 to 2008. Results indicate that depreciation of exchange rate, growth of money and real GDP are fundamental in explaining the Nigerian inflationary trend such that depreciation of exchange rate is responsible for increasing rate of inflation in the long-run. Also, the lagged cumulative influence of Nigerian rate of inflation is also pronounced. The study draws conclusion that depreciation of currency is not the best to control inflation despite its role in improving production in the economy. However, exchange rate depreciation is suggested to compliment other measures in reducing inflationary rate.

In a study of Ghana, Chhibber and Shafik (1990) examine a model of inflation for the country over the period covering 1965 to 1988 and find that increase in money supply is held responsible for the inflationary trend in Ghana. In addition, exchange rate (official) and real wages have not significantly affected inflation but a positive significant effect of the exchange rate (parallel) on inflation is reported. The study points out that the degree of currency depreciation influence on inflation will depend on the effect of the measure on the public income and spending as well as on the monetary policy measures.

Durevall and Ndung'u (2001) investigate the dynamics of inflation in Kenya by employing Johansen co-integration and ECM method over the period 1974 to 1996. A parsimonious result reveals that exchange rate, international prices, and terms of trade are co-integrated with inflation. In addition, growth of money and rate of interest influence inflation in the short run. The study also finds the percentage of inertia of the present inflation till 1993 to be greater than that after 1993. The results of all these studies are inconclusive as the influencing factors differ from one study to another.

Some studies have also examined the relationship between the money supply and the rate of interest. For example, Funke (2001) investigates the determining factors of monetary aggregates in Euroland using quarterly data over the period 1980:1 to1998:4. The Phillips–Hansen (1990) FM-OLS estimator and error correction model are employed. Findings show that the interest rate is statistically significant in influencing the demand for broad and narrow money. The ECM results also show that as predicted theoretically, short run effect of income and interest rates have the expected signs such that an increase in income increases the money demand and a decrease in interest rates increases the money demand.

In Nigeria, Ezeabasilli and Mojekwu (2011) examine the relationship between fiscal deficits, money supply and nominal rate of interest using the method of co-integration. Results of the empirical study show that fiscal deficit has significant positive relation with income, to the extent of affecting higher interest rates. More so, money supply and interest rates are negatively related but inflation and interest rate have positive significant relation. The study suggests that the Nigerian authorities ought to consider bond financing deficit rather than monetary means.

Monnet and Weber (2001) investigate how money supply is related to interest rate for 40 countries and find support for Fisher equation perspective that money supply and interest rate have positive relationship on one hand, and that money supply and interest rate have negative relationship on the other hand, thus supporting the liquidity effect perspective. Making monetary policy a rule for interest rates instead of making it money never alters these associations between the money growth and interest rate.

The study by Alatiqi and Fazel (2008) employs the Engle-Granger method of co-integration and the Granger causality test to provide evidence that negative causal association is lacking between money supply and interest rates on one hand and between the rates of interest and stock prices on the other hand. Therefore, there is no long run significant causal association running from money supply to stock prices. From the forgoing studies, some results support Fisher equation perspective that money supply and interest rate have positive relationship while others support the liquidity effect perspective that money supply and interest rate have negative relationship. Based on these mixed and conflicting results, it appears the results of the previous studies are inconclusive and more studies are needed.

2.3.1.1 Evaluation of the methodology of the studies reviewed

The foregoing studies have adopted different techniques of estimation in an attempt to investigate the relationship among fiscal deficit, money supply, interest rate and inflation. The techniques of estimation can influence the robustness of the results obtained as each of the method has it associated problem. For example, some studies (Cacy, 1975; Cagan, 1956; Chaudhary & Ahmad, 1995; Choudhary & Parai, 1991; Giannaros & Kolluri, 1985; Heller, 1980; Kilindo, 1997; Monnet & Weber, 2001; Oyejide, 1972; Sargent & Wallace, 1973) have employed ordinary least square (OLS) method to examine the relationship among the fiscal deficit, money supply, and inflation. Most of the estimations of OLS have been argued to suffer from serial correlation, in which case such OLS estimates are not going to be efficient any longer. The estimated variances associated with the coefficients of regression are going to be biased and inconsistent thereby making the test of hypothesis invalid. Also the standard error of the OLS will be incorrect if the disturbance (error) term indicates serial correlation. However, the OLS estimates are still unbiased and consistent in this case (Asteriou & Hall, 2007).

In order to avoid the problem of serial correlation, some studies (Ahking & Miller, 1985; King & Plosser, 1985; Lounganis & Swagel, 2001) have employed vector autoregressive (VAR) method of estimation. This technique has its strength in that it is very simple as it treats all variables as exogenous and endogenous with the estimation of each equation by OLS. Also, forecasts gotten from VAR model are somewhat better than those from the sophisticated simultaneous model. However, it weakness is that there is no limitation such that all the variables cause one another and the method is not developed on the basis of any economic theory. Also, the method utilizes too many degrees of freedom in a case where the lag number chosen is very large and this leads to large parameters associated with difficulty of interpretation (Asteriou & Hall, 2007; Brooks, 2008).

In this area of study, some studies (Akhtar 2005; Beltas & Jones, 1993; Burdekin & Wohar, 1990; Hondroyiannis & Papapetrou, 1994; Oladipo & Akinbobola, 2011; Onwioduokit, 1999) have used Granger causality approach. This method gives room for the detection of the directions of causation between variables. An alternative approach to Granger is the Sims causality approach which was applied by some studies (Bengali, Khan, & Sadaqat, 1999; Brillembour & Khan, 1979; Khan & Siddiqui, 1990) to test the causality between variables. The Sims method also offers opportunity to determine the directions of causation between variables just like Granger's method. However, because

Sims approach makes use of more regressors resulting from the addition of lead terms, the technique causes more degrees of freedom to be lost (that is, it consumes larger number of degrees of freedom).

Simultaneous method has been used by some studies in investigating the association among these variables. For example, two stages least squares (2SLS) has been used by some studies (Chhiber & Shafik, 1990; Dogas, 1992; Dutton, 1971; Ndebbio, 1998) to investigate the relationship among the variables. The main weakness of 2SLS is that it is not more efficient asymptotically because 2SLS neglects any information that could be available with respect to the error covariance as well as supplementary information which dependent variables of other equations could have (Books, 2008). However, the three stages least squares (3SLS) on the other hand, as used by Aghevli and Khan (1977a, 1978) has the strength of giving room for someone to put into account all a-priori restriction intrinsic to the specification (Aghevli & Khan, 1978). The method makes necessary correction for the possible cross-equation autocorrelation. The 3SLS method carries out the estimation of the whole equations at once as a system instead of estimating them one after the other (Korsu, 2009). In the process of estimation, three stages least squares gives the step three which permits non-zero covariance between the disturbance terms in the structural equations and it is more efficient asymptotically (Books, 2008). One study (Olusoji & Oderinde, 2011) employ Toda-Yamamoto Granger no causality and seemingly unrelated regression (SUR) to examine the connection between fiscal deficit and inflation. The method of seemingly unrelated estimator is more efficient than the equation-by-equation OLS, unless equations are unrelated to each other. It is more efficient because it exploits exclusive restrictions. Besides, SUR captures the efficiency due to the correlation of the disturbances across equations (Baltagi, 2005).

In the examination of the relationship among the fiscal deficit, money supply, and inflation, some studies (Catao & Terrones, 2005; Fischer et al., 2002) have employed the technique of Panel regression based on pooled OLS fixed effect or random effect method. One of the weaknesses of the method is that the estimates resulting from the pooled OLS suffer from biasness and are not consistent because the lagged endogenous variable are been correlated with each particular effects, and perhaps with residuals. While the fixed effect cancelled out the particular effects, the lagged endogenous variable stands to be correlated with residuals. Also, potentially, inferences from the fixed effect estimator are associated with serial correlation, heteroscedasticity, and non-normality (Wooldridge, 2009). While generating a transformed variable for random effect model, the correlation of quasi-demeaned endogenous variable with the quasi-demeaned residuals resulted and this leads to make random effect to be bias and not consistent (Asteriou & Hall, 2007). Lastly, the panel regression is weak in the sense that it fails to provide for spurious regression in spite of the fact that most time series are non-stationary and when employed in regression, they are often associated with inconsistency and invalid result (Brooks, 2008).

From this field, one study (Hoover, 1991) has used recursive system and OLS technique to investigate the causal relation between money, prices and interest rate. The interdependence between the stochastic disturbance term and the endogenous explanatory variable(s), makes it inappropriate for the OLS estimation of an equation in a system of simultaneous equation, otherwise the estimators are not only biased (in small samples) but also inconsistent; that is the bias does not disappear no matter how large the sample size. However, recursive system makes it possible for the OLS to be applied appropriately even in the context of simultaneous equation. With recursive or causal models, OLS can be applied without the simultaneous equation problem (Gujarati & Porter, 2009).

Within this context, some studies (Alatiqi & Fazel, 2008; Ezeabasilli & Mojekwu, 2011; Funke, 2001; Habibullah, Cheah & Baharom, 2011) have employed the Engle & Granger co-integration and error correction mechanism to examine the relationship among variables. The Engle and Granger co-integration approach is weak in that the maximum co-integrating relationship that can be estimated is only one irrespective of the number of variables in a system. Where there are multiple co-integrating relationships, it becomes difficult to either know the presence of others or determine the strength of co-integrating relationships. Besides, simultaneous equation bias could occur due to small sample problem (Brooks, 2008). However, in the study of Funke (2001), fully modified OLS of Phillips and Hansen were used to depart from the Engle and Granger co-integration. Error correction mechanism has the following strengths which makes it application appropriate. Firstly, suppose there is co-integration, ECMs are usually modelled with respect to first difference which gets rid of trends from the variable included. They neutralize the problems associated with spurious regressions. Secondly, ECMs make it easy to fit into general to specific approach to modelling of econometric which involves parsimonious ECM model that fits the data sets appropriately. Thirdly, the disequilibrium error term is a variable which is stationary as defined by co-integration. This consequently implies that since the two variables are co-integrated there exist some processes of adjustment which make it impossible for the errors in the long run relationship to increase in size (Asteriou & Hall, 2007).

Some other studies (Durevall & Ndung'u, 2001; Metin, 1995, 1998; Olubusoye & Oyaromade, 2008; Sowa, 1994) have used Johansen co-integration and error correction mechanism to examine the long run and short run relationship of the variables. The method of Johansen as compared to Engle and Granger provides a number of co-integrating equations and estimates of all co-integrating vectors in the multivariate case. The Johansen approach shows the process of adjustment of the system from short run dynamics to long run equilibrium. This makes it more appropriate than the Engle and Granger method (Brooks, 2008).

Studies (e.g., Akinbobola, 2012; Chimobi & Igwe, 2010) have employed the Johansen co-integration approach and vector error correction model (VECM) to determine the long run and short run relationship among fiscal deficit, money supply and inflation. The models employing the Johansen approach are the VECM or what are known as co-integrating vector autoregressive models. The VECM has important strength as it is advantageous to identify and test whether the structural coefficients describing the theoretical associations are significantly different from zero or not (Rao, 2005). The renormalized beta provided by the Johansen co-integration test does not provide the test of significance of each parameter estimate, particularly, for the short run. This is rather provided for through the estimation of VECM.

One study (Imimole & Enoma, 2011) employed autoregressive distributed lag (ARDL) bound test co-integration approach and error correction mechanism. The method of bounds testing is advantageous in that it possesses better properties that accommodate small sample size more than the Engle and Granger (1987), and Johansen and Juselius (1990) procedure of co-integration (Narayan & Smyth, 2005). The approach of ARDL also gives room for different optimum lags to be assigned to variables which cannot be possible while using the conventional approaches to co-integration. In addition, the ARDL approach makes use of single reduced form equation as compared to the convectional approach of co-integration where estimation of long run associations is done within a system equation (Ozturk & Acaravci, 2010).

By taking into consideration the strengths and weaknesses associated with each of the method, the current study applied the procedures of Johansen and Juselius (1990) of co-integration and vector error correction model (VECM) in the estimation of money supply model by following Akinbobola (2012), and Chimobi and Igwe (2010). And for the estimation of price model, the present study follows Imimole and Enoma (2011) by employing autoregressive distributed lag (ARDL) bound test co-integration approach and error correction mechanism. The summary of the empirical literature review on fiscal deficit, money supply, interest rates, and inflation is shown in Table 2.1.

Table 2.1
Summary of literature on fiscal deficit, money supply and inflation

Authors/ Year	**Period**	**Objective**	**Country Detail**	**Estimation Model**	**Econome-tric Tool**	**Comment/ Findings**
Cagan 1956).	Data for each country ranged from 1920-1946	Explains how inflation behaves during hyperinflation, periods when government is resorting to money creation as the main means of financing its expenditures	Austria, Germany Greece, Hungary Poland, Russia.	Hyperinflati on	Least squares	Deficit was found to be the outcome of increase government expenditure exceeding revenue and thus be responsible for the cause of inflation.
Ahking and Miller (1985)	1950-1980	Investigate how the public fiscal deficit, growth of monetary base, and inflation affect one another in an autoregressive form	United States	Auto-regressive model	A generalizat ion of Hsiao's (1979; 1981) bivariate autoregress ive method,	Inflation, growth of monetary base and public fiscal deficit has inflationary causal relationships for the period 1950s and 1970s
King and Plosser (1985)	1950-1982	Examine the flow of causality from the government fiscal deficit to monetary base and inflation	12 countries including the United States	Auto-regression model	Ordinary least square and vector auto-regression	No significant causality flowing to monetary base and inflation from the government fiscal deficit was found
Burdekin and Wohar (1990)	1950-1982	Examine the flow of causality from the government fiscal deficit to monetary base and inflation	12 countries including the United States	Auto-regression model	Ordinary least square and vector auto-regression	No significant causality flowing to the monetary base and inflation from the government fiscal deficit was found

Table 2.1 (Continued)

Authors/ Year	**Period**	**Objective**	**Country Detail**	**Estimation Model**	**Econome-tric Tool**	**Comment/ Findings**
Cacy (1975)	1955-1974	Iinvestigates how the budget deficit is related to the money supply (M1 and M2) using annual data of US	United States	Money Supply model	Ordinary Least Square	Findings show that fiscal deficit is negatively and positively related to M1 (which composes currency plus demand deposits in the hand of public) and M2 (which composes M1 plus time deposits), respectively.
Giannaros and Kolluri (1985)	1952-1983	Investigate the hypotheses of monetarist in respect of how the money growth and inflation are affected by fiscal deficits	Ten industrial ized countries	The growth of money supply equation, and inflation equation econometric models.	Ordinary Least Square	In the case of United States, the negative sign expected is observed while in Belgium and Japan, the money s upply is found to be negatively related to deficit spend ing.
Lounganni and Swagel (2001)	1964-1998	Investigate the correlation among the money growth, inflation, and fiscal deficit	53 developi ng countries	Money growth, inflation, and fiscal deficit models	VAR techniques	In the long run, fiscal deficit has strongest negative correlation with the money growth in countries with average inflation rates such as Mediterrane-an region.

Table 2.1 (Continued)

Authors/ Year	**Period**	**Objective**	**Country Detail**	**Estimation Model**	**Econome-tric Tool**	**Comment/ Findings**
Fischer, Sahay and Vegh (2002)	1960-1995	Examine the fiscal deficit's influence on inflation.	94 develope d and developi ng countries	Inflation and Money growth	Panel regression	Findings reveal that the government fiscal deficits cause inflation to rise excessively and that as the fiscal balance deteriorates, inflation increases sharply.
Choudhary and Parai (1991)	1973-1988	Investigate the influence of government budget deficit on inflation.	Peru	Rational-expectations macro model of inflation	Ordinary Least Square	Government budget deficit and growth rate of money supply affect inflation significantly.
Sowa (1994)	1985-1989	Examines the factors that influence inflation	Ghana	Error correction model	Cointegrati on and Error correction mechanism	In the short and long run, volatility of output plays important role in influencing inflation more than monetary factors.
Dogas (1992)	1963-1988	Investigates the effect of public fiscal deficit	Greece	Post-Keynesian inflation mo del	Two stages least square equation	Public deficit is found to have considerable impacts on the country's inflation

Table 2.1 (Continued)

Authors/ Year	**Period**	**Objective**	**Country Detail**	**Estimation Model**	**Econome-tric Tool**	**Comment/ Findings**
Hondroyiannis and Papapetrou. (1994).	1954-1990	Investigate the long-run and causality relationship between public budget and inflation	Greece	Co-integration model	Co-integration and causality	It was found that co-integration and bidirectional causality exists between the two variables.
Metin (1995).	1950-1988	Examines the inflationary process in Turkey	Turkey	The structural model of the inflationary process	Johansen Co-integration and Error correction mechanism	Fiscal expansion influences inflation and in the short run, inflation is positively affected by excess money demand
Metin (1998)	1952-1987	Investigates the relationship between inflation and the budget deficit	Turkey	Error correction model	Johansen Co-integration and Error correction mechanism	It is found that inflation quickly result from rising government fiscal deficit while the growth of real income negatively influences inflation.
Habibullah, Cheah and Baharom (2011)	1950-1999	Investigate the phenomenon of government fiscal deficit and inflation relationship	3 developing countries of Asia	Error correction model	Engle and Granger cointegration and error-correction mechanism	Findings show a long run association between public fiscal deficit and inflation, and that inflationary trends in Asian countries are caused by deficits.

Table 2.1 (Continued)

Authors/ Year	**Period**	**Objective**	**Country Detail**	**Estimation Model**	**Econome-tric Tool**	**Comment/ Findings**
Oyejide (1972)	1957-1970	Investigates budget deficit pattern and the effects of these deficits on domestic liquidity, inflation and capital formation.	Nigeria	Fisher's type equation	Least square method	The measure of financing the Nigerian deficit was directly related with the general price level
Onwioduokit (1999)	1970-1994	Examines the causality between budget deficits and the general price level	Nigeria	Autoregressive distributed lag model of fiscal deficit ratio to GDP	Granger causality	Fiscal deficit granger-causes inflation without any feed back from inflation except for the fiscal deficit to GDP ratio.
Ndebbio (1998)	1970-1992	Examines fiscal deficit and inflationary process in Nigeria	Nigeria	Inflation and money supply	Two stages least squares estimation and Simulation	Large fiscal deficit greatly caused a rise in inflation as well as increase in imports through money supply.
Olubusoye and Oyaromade (2008).	1970-2003	Investigate the fundamental factors that influence variation in Nigerian inflation	Nigeria	Error correction model of price level	Error correction mechanism	All the variables have significant influence on the inflation, except output and money supply has significant negative impact on Nigerian inflation

Table 2.1 (Continued)

Authors/ Year	**Period**	**Objective**	**Country Detail**	**Estimation Model**	**Econome-tric Tool**	**Comment/ Findings**
Akinbobola (2012)	1986-2008	Analyzes the dynamic relationship among the supply of money, rate of exchange and level of inflation	Nigeria	Dynamic model of inflation	Vector Error Correction Mechanism	Inflation is found to be significantly and negatively influenced by money supply in the long run.
Chimobi and Igwe (2010)	1970-2005	Investigate the long run association of fiscal deficit with the growth of money and price level.	Nigeria	Vector Error Correction model	Johansen co-integration test and Vector Error Correction Mechanism	In the long-run, inflation and money supply; deficit and money are positively related; unidirectional causality runs from inflation to deficit, and from money to inflation; bilateral causality exist between inflation and fiscal deficit.
Oladipo and Akinbobola (2011)	1970-2005	Examine the causality between the government fiscal deficit and inflation	Nigeria	Single equation model of consumer price index	Granger Causality approach	The flow of causality is from the government fiscal deficit to inflation without any feedback from inflation.
Olusoji and Oderinde (2011)	1970-2006	Examine the connection between fiscal deficit and inflation	Nigeria	Bivariate Autoregressive model	Toda-Yamamoto Granger no causality and Seemingly Unrelated regression	No clear cut proof of causation between fiscal deficit and inflation was found.

Table 2.1 (Continued)

Authors/ Year	**Period**	**Objective**	**Country Detail**	**Estimation Model**	**Econome-tric Tool**	**Comment/ Findings**
Aghevli & Khan. (1977a).	1951-1972	Investigate the dynamic developments of high inflation	Indonesia	Dynamic model of inflation	Full Information Maximum Likelihood, Simultaneous and simulation techniques	A Rising money supply is a consequence of rising inflation as it induces increased government expenditure relative to its revenue.
Dutton (1971).	1958-1966	Analyzes the level of variation in the price level with respect to government deficit	Argentine	Model of variation in price level, money stock, monetary base and deficit expenditure	Two stages least square	A rising price level during the period leads to a rising nominal deficit and this increases the money supply.
Aghevli and Khan (1978).	1961-74 1961-74 1964-74 1961-74	Examine public deficits and the inflationary process in four developing countries.	Columbia, Dominican Republic, Brazil and Thailand	Structural model of inflation, government expenditure, government revenue money supply, and expected inflation	Three stages least square	It is found that government expenditure adjusts faster than its revenue when the level of price rises and this causes deficits to rise.
Heller (1980).	1972-1978	Investigates the consequences of inflation on fiscal policy	24 developing countries	Structural model of government expenditure, government revenue , and expected inflation	Ordinary Least Square, and a minimum-distance, non-linear technique	13 developing countries examined agreed with Aghevli and Khan's results while 11 remaining developing countries failed to comply

Table 2.1 (Continued)

Authors/ Year	Period	Objective	Country Detail	Estimation Model	Econome-tric Tool	Comment/ Findings
Kilindo (1997).	1970-1984 1985-1991	Examines the fiscal operations, money supply and inflation in Tanzania by applying Aghevli and Khan (1978) developed model	Tanzania	Structural model of inflation, government expenditure, government revenue money supply, and expected inflation	Ordinary Least Square,	Public expenditure exceeded the taxes reve-nue during the time the prices were increasing and thus led to deficits.
Catao and Terrones (2005).	1960-2001	Examine the effect of public fiscal deficits on the rate of inflation	107 develope d and developi-ng countries	Inflationary model	Panel regression.	Developing countries with high inflation have positive relation of deficits with inflation but not in advanced countries with low inflation.
Sargent and Wallace (1973).	1921-'22 1920- '23 1943- '44 1922- '24 1945-'46 1922-'23 1921-'24	Investigate the causal association between money and price level	Austria, Germany Greece, Hungary Hungary Poland, Russia.	Model of hyper Inflation and expectation	Least square	Causation runs from money to prices and vice versa.
Khan and Siddiqui (1990).	1972-1981	Examine causality between Money, prices and economic activity	Pakistan	Autoregress-ive Integrated Moving Average (ARIMA) models	Sims (1972) causality	Bidirectional association exist bet-ween broad money and consumer price index.
Bengali, Khan, and Sadaqat (1999).	1972-1990	Investigate the causality between Money, Income, Prices	Pakistan	Autoregress-ive Integrated Moving Average models	Sims (1972) causality	Bidirectional causality exists between money, and consumer price index

Table 2.1 (Continued)

Authors/ Year	Period	Objective	Country Detail	Estimation Model	Econome-tric Tool	Comment/ Findings
Brillembour & Khan (1979).	1870-1975	Investigate the causal association between money and inflation	United States	Autoregressive Integrated Moving Average (ARIMA) models	Sims and pierce causality approach	Findings show that money causes price level in the short run without afeedback.
Chaudhary and Ahmad (1995)	1973–92 1973–82 1982–92	Examine the determinants of money supply, price, money demand, and output.	Pakistan	Simultaneous models	Ordinary Least Square	Findings reveal that output effect on price is negatively significant while money supply and imports price positively affect the price level.
Beltas and Jones (1993).	1970-1988	Examine the causality between money and inflation	Algeria	Bivariate Granger-Causality Model of Money and inflation models	Granger causality	Findings show that money causes inflation in the short run without a feed back from inflation, thus suggesting unidirectional causality between them.
Akhtar (2005).	1954-2002	Examines the granger-causality between money growth, inflation, currency devaluation and economic growth	Indonesia	Bivariate Granger-Causality Model	Granger causality	Findings show that inflation has positive significant effect on the money supply and causality runs from inflation to money supply

Table 2.1 (Continued)

Authors/ Year	**Period**	**Objective**	**Country Detail**	**Estimation Model**	**Econome-tric Tool**	**Comment/ Findings**
Imimole, and Enoma, (2011).	1986–2008	Investigate the influence of exchange rate depreciation on Nigerian inflationary trend	Nigeria	Autoregressive Distributed Lag model	ARDL bound approach to co-integration and ECM technique	Results indicate that depreciation of exchange rate, growth of money and real GDP are fundamental in explaining the Nigerian inflationary trend.
Chhiber and Shafik (1990).	1965-1988	Examine inflationary trend in Ghana	Ghana	Inflationary model	Two stages least square	Findings show that increase in money supply is held responsible for the inflationary trend in Ghana.
Durevall and Ndung'u, (2001)	1974-1996	Analyze the dynamics of inflation in Kenya	Kenya	Single equation error correction model of inflation	Johansen cointegration and Error correction mechanism	Result reveals that growth of money and rate of interest significantly impact inflation in the short run.
Hoover (1991).	1950-1985	Investigates the causal relation between money, prices and interest rate	United States	General-to-specific method of modelling	Recursive regression techniques and OLS	Findings show that money is caused by prices and the prices are not caused by money.

Table 2.1 (Continued)

Authors/ Year	**Period**	**Objective**	**Country Detail**	**Estimation Model**	**Econome-tric Tool**	**Comment/ Findings**
Funke (2001).	1980:1-1998:4	Investigates the determining factors of monetary aggregates in Euroland	Euroland	Error correction model	The Phillips–Hansen (1990) FM-OLS estimator Error correction mechanism	In the short run, an increase in income increases the money demand and a decrease in interest rates increases the money demand.
Ezeabasilli and Mojekwu (2011).	1971-2006	Examine the relationship among fiscal deficits, money supply and nominal rate of interest	Nigeria	Error correction model	Engle-Granger (1987) two step Co-integration method	Money supply and interest rates are negatively related but inflation and interest rate have positive significant relation.
Monnet and Weber (2001).	1960-1998	Investigate the relation between money supply and interest rate	40 countries	Simple model of money and price based on quantity theory of money	Least square method	Findings support Fisher equation view that money supply and interest rate are positively related and liquidity view that the two variables are negatively related.
Alatiqi and Fazel (2008)	1965-2005	Examine the causal association between money supply and interest rates, and between the rates of interest and stock prices	Kuwait	Bivariate Granger-Causality Model	Engle-Granger co-integration and the Granger causality test	Positive causal association is found between money supply and interest rates

2.3.2 Literature on fiscal deficit effects on the current account

Evidence on the fiscal deficit association with external sector (balance of payments) is been split, and to that extent no general consensus has been reached in the literature. For example, Morgan (1979) develops analytical framework to show how budgetary development and domestic liquidity, aggregate demand and the balance of payment are interrelated in 12 oil-exporting countries using the concepts of domestic budget balance and foreign budget balance. He finds a strong relationship among fiscal operation, credit creation, inflation and balance of payments. The results show that the domestic budget balance is the primary determinant of movements in domestic liquidity in oil-exporting countries.

A macroeconomic model is developed by Aghevli and Sassanpur (1982) to investigate the consequences of an increase in the crude oil prices in the Iranian economy from the period covering 1960 to 1977. Report of simulation exercise confirms that increased oil revenues promote the growth of the economy of Iran. However, the rise in government expenditures brought about by increase oil revenues also increases the demand for imports, thereby worsening the balance of payments. The study reveals that in order to keep external balance, expenditure should match absorption capacity in developing countries where government acts as the driver of growth.

In the work of Zaidi (1985), cross sectional time series data for 12 developing countries for the period over 1972 to 1980 is used to examine how fiscal policy is related to current account balance (balance of payment). His finding reveals positive relationship between the variables in question and diverse directions of causality for the variables.

For Thailand and Greece it is reported that a unidirectional causality runs from the current account deficit to budget deficit. For Philippines and South Korea a bi-directional causality exists between the fiscal deficits and current account deficits. Budget deficit and current account balance are not related in the case of Brazil. An important and central aspect of the study is the examination of the effects of savings, investment and fiscal deficits on the current account deficits of some developing countries using the Granger-Sims causality tests. The results show that annual changes in both domestic investment and savings cause changes in the current account balance.

In Venezuela, another oil producing country, Vaez-zadeh (1989) carries out two stages least squares estimation and simulation to look into the oil wealth and economic behaviour over the period 1965-1981. It was reported that there was a great adverse effect of higher oil revenues when the oil wealth effect was taken into consideration. Study carried out by Islam (1998) to examine how budget deficits is related to trade deficits for Brazil from 1973:1 to 1991:4 using the Granger Causality test reveals that there is presence of bilateral causality between trade deficits and budget deficits.

A structural model is employed by Mansur (1989) over the period 1970 to 1982 to examine the variables such as price, revenue, import, income and private sector absorption equations. The objectives of the study are two-fold: one, to analyze the associations between fiscal expansion and the current account balance (balance of payment), and two, to find out how government fiscal operations, domestic credit and money supply are related. Reports of simulation indicate that current account worsens when bank credit and external borrowing are used to finance an enlarged budget deficit caused by increased government expenditure. Fiscal restrain is therefore proposed for Philippines for the achievement of a sustainable balance of payments position.

A set of structural equation is also formed by Bartoli (1989) to investigate the consequences of budget deficit on the current account balance (balance of payment) in ten Latin American countries (Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Paraguay, Peru, Uruguay and Venezuela). It is reported that the inflation tax and financing approach to budget deficit adversely influence domestic savings to the extent of deteriorating the current account deficit. There is evidence of crowd-in effect on private investment by government capital expenditure, but it raises domestic absorption, which negatively affects the current account deficit.

Using co-integration method, Khalid and Guan (1999) examine how budget deficit is associated with the current account deficits in a chosen sample of five developed countries (US, UK, France, Canada and Australia) over the period 1950 to1994 and five developing countries (India, Indonesia, Pakistan, Egypt and Mexico) over the period 1955 to 1993. The time series variables use in their studies are the current account deficit, budget deficit, trade-weighted exchange rate and nominal GNP. Findings show that budget and current account deficits have association in four out of five developing countries, but for the advanced country no such relationship is reported.

Co-integration method and error correction mechanism are used by Akbostanci and Tunc (2002) to examine the linkages between budget deficit and the trade deficit for Turkey during the period 1987-2001. The authors conclude that the twin deficits hypothesis holds, and the Ricardian equivalence hypothesis is not valid in the case of Turkey. The study suggests that any policy measures to reduce the budget deficit could assist in improving the trade balance in Turkey. Autoregressive distributive model and the bounds test for co-integration are employed by Saleh, Naair and Agalewatte (2005) to investigate the existence of the long run relationship between the current account deficit and budget deficit in Sri Lanka over the period 1970 to 2003. Findings are parallel to the Keynesian view that there exists a long run relationship between the two deficits and the direction is such that the budget deficit causes the current account deficit.

Study on Philippines by Pahlavani and Saleh (2009) over the period 1970 to 2005 shows the existence of a bi-directional causality between budget deficits and current account deficits. The results suggest that policy measures to reduce the budget deficit could play an important role in reducing the current account imbalances and vice-versa. Also, Granger causality is employed by Anoruo and Ramchander (1998) to investigate the direction of causality between the trade deficit and budget deficit for five Southeast Asian countries: India, Indonesia, Korea, Malaysia and Philippines. Results show that the direction of causality runs from the trade deficit to budget deficit but not from the budget deficit to trade deficit.

Using cointegration and Granger causality approaches, Arize and Malindretos (2008) conduct a study on ten African countries (Nigeria, Botswana, Burundi, Mauritius, Rwanda, Sierra-Leone, South Africa, Togo, Tunisia, and Kenya) using a quarterly data for the period 1973:2-2005:4 to examine the long run association of trade deficits with budget deficits. The results provide evidence of positive long-run relationship between the two deficits and that the budget deficit causes the trade deficit in the short run. The report of the analysis is that bidirectional long-run causality between the two deficits is strongly supported empirically while unidirectional causality and no causality are found in the short run result. The policy action suggested is that government should at first focus on policies aimed at decreasing the trade deficit in order to get better result at lowering trade and budget deficits.

In Nigeria, Onafowora and Oluwole (2006) employ the method of co-integration and vector error correction, Granger-Causality tests and generalized impulse response to examine the existence of the "twin deficits" in an oil dependent economy of Nigeria. It is reported that in both the short- run and long-run, trade and budget deficits are positively related. Contrary to the conventional belief that the trade deficit is the result of budget deficits, a unidirectional causality from Trade deficit to Budget deficit was reported for Nigeria. The authors suggest that attempt to lower budget deficits in Nigeria should commence from lowering the trade deficits which could be made possible via indirect monetary channels.

Study by Olopoenia (1991) examines the fiscal response to oil wealth and balance of payments performance in Nigeria for the period 1970 to 1989. Structural macro-economic model that incorporates the domestic budget balance concept in Nigeria is adopted. Findings show that government's fiscal behaviour is responsible for the current account balance at the period of the oil boom era. Along the same line, Ariyo and Raheem (1991) employ an ordinary least square and simulation techniques to investigate the impacts of fiscal deficit on some macroeconomic aggregates in Nigeria during the period 1970 to 1990. Findings show that large budget deficit positively affects major macro variables except the current account balance.

Soludo (1997) conducts an estimation of error correction forms of equations and simulation to investigate the fiscal approach to the balance of payments in Nigeria over the period 1970 to 1995. It is reported that fiscal deficit is better for growth, export and trade and current account balances under the tight measures for minimizing importation. In addition, the results suggest that budget deficits are indirectly related to trade deficits.

In another study for Nigeria, Omankhanlen, and Mukoro (2011) examine the extent to which the monetary approach to balance of payment explains the developments in the current account in Nigeria during 1986 to 2007 using OLS method. Finding shows that GDP is positive and plays significant roles in determining current account balance. Both domestic credit and government expenditure are also negatively significant. The authors recommend that other measures apart from monetary instruments should be given preference to realize stability in the balance of payment.

Egwaikhide (1997) uses OLS and simulation methods to examine the effects of budget deficits on the current account balance in Nigeria over the period 1973 to 1993. Finding shows that budget deficit worsens the current account irrespective of whether it is financed by bank credit or external borrowing. In particular, the author finds that financing budget deficit/GDP ratio through external borrowing will not improve trade balance as much as under credit financing. It is suggested that for an improvement in external balance there must be budget discipline. Another study by Egwaikhide (1999) examines the impacts of budget deficit on trade balance in Nigeria using a macroeconomic model. Report of simulation policy indicates that budget deficit due to rising government expenditure negatively affects the balance of trade whether it is financed by money or by borrowing externally. Demand management policies are suggested to be desirable for the realization of external balance.

Some studies that have provided evidences of positive results on the relationship between fiscal deficit and current account deficit in developed countries include the study of Piersanti (2000) for seventeen OECD countries, Abell (1990), and Bundt and Solocha (1988) for United States, Kearney and Monadjemi (1990) for Argentina, Britain, Canada, France, Germany, Ireland, Italy, and United States, and the study of Vamvoukas (1997) for Greece. On the other hand, evidences have also been found against the twin deficits. For example Khalid and Guan (1999) find that in the sample of developed countries over the period 1950 to 1994, there is no relationship between fiscal deficit and the current account deficit. Other studies that have found similar support for Ricardian equivalence that the budget deficit has no effect on the trade deficit include Zaidi (1985) in the case of Brazil, Samadi, 2006 for Iran, Jordan, Kuwait, Morocco, Oman and Tunisia, Enders and Lee (1990) for United States.

2.3.2.1 Evaluation of the methodology of the studies reviewed

While investigating the fiscal deficit effects on the current account, many studies have adopted different techniques of estimation. The techniques of estimation can influence the robustness of the results obtained as each of the method has it associated problem.

For example, some studies (Aghevli & Sassanpour, 1982; Ariyo & Raheem, 1991; Egwaikhide, 1997, 1999; Mansur, 1989; Morgan, 1979; Olopoenia, 1991; Omankhanlen & Mukoro, 2011) have employed ordinary least square (OLS) method to examine the relationship among the fiscal deficit, money supply, and inflation. Most of the estimation of OLS have been argued to often suffer from serial correlation, in which case such OLS estimates are not going to be efficient any longer, the estimated variances associated with the coefficients of regression are going to be biased and inconsistent thereby making the test of hypothesis invalid, and the standard error of the OLS will be incorrect if the disturbance error term indicates serial correlation. However, the OLS estimates are still unbiased, and consistent in this case (Asteriou & Hall, 2007).

To avoid the problem of serial correlation, some studies (Enders & Lee, 1990; Kearney & Monadjemi, 1990) have employed vector auto regressive VAR method to investigate the fiscal deficit effects on the current account. This technique has its strength in that it is very simple as it treats all variables as both exogenous and endogenous with the estimation of each equation by OLS. Also, forecasts gotten from VAR model are somewhat better than those from the sophisticated simultaneous model. However, it weakness is that there is no limitation such that all the variables cause one another and the method is not developed on the basis of any economic theory. Also, the method utilizes too many degrees of freedom in a case where the lag number chosen is very large and this leads to large parameters associated with difficulty of interpretation (Asteriou & Hall, 2007; Brooks, 2008).

Also, in the examination of the effects of fiscal deficit on the current account, some studies (Abell, 1990; Anoruo & Ramchander, 1998; Arize & Malindreto, 2008; Bundt & Solocha, 1988; Islam, 1998; Onafowora & Oluwole, 2006; Pahlavani & Saleh, 2009; Samadi, 2006; Vamvoukas, 1997) have used Granger causality approach. This method gives room for the detection of the directions of causation between the variables. Other studies (Piersanti, 2000; Zaidi, 1985) have used both Granger and Sims causality approaches to test the causality between the variables. The Sims method also offers opportunity to determine the directions of causation between the variables just as Granger's method. However, because Sims approach makes use of more regressors resulting from the addition of leads terms, the technique causes more degrees of freedom to be lost as it consumes larger number of it (Asteriou & Hall, 2007).

The method of simultaneous has been used by some studies in investigating the fiscal deficit effects on the current account. For example, two stages least squares (2SLS) has been used by some studies (Bartoli, 1989; Vaez-Zadeh, 1989) to investigate the relationship among the variables. The main weakness of 2SLS is that it is no more efficient asymptotically because it neglects any information that could be available with respect to the error covariance as well as supplementary information which dependent variables of other equations could have (Books, 2008).

Some other studies (Akbostancı & Tunc, 2002; Khalid & Guan, 1999; Soludo, 1997) have used Johansen co-integration and error correction mechanism to examine the long run and short run relationship of the variables. The method of Johansen as compared to Engle and Granger provides a number of co-integrating equations and estimates of all co-integrating vectors in the multivariate case. The Johansen approach shows the process of adjustment of the system from short run dynamics to long run equilibrium. This makes it more appropriate than the Engle and Granger method (Brooks, 2008).

One study (Saleh, Naair, & Agalewatte, 2005) have employed autoregressive distributed lag (ARDL) bound test co-integration approach and error correction mechanism to determine the relationship between the fiscal deficit and current account. The method of bounds testing is advantageous in that it possesses better properties that accommodate small sample size more than the Engle and Granger (1987), and Johansen and Juselius (1990) procedure of co-integration (Narayan & Smyth, 2005). The approach of ARDL also gives room for different optimum lags to be assigned to variables, this, which may not be possible while using the conventional approaches to co-integration. In addition, the ARDL approach makes use of single reduced form equation as compared to the convectional approach of co-integration where estimation of long run associations is done within a system equation (Ozturk & Acaravci, 2010). Table 2.2 shows the summary of reviewed empirical literature on fiscal deficit effects on the current account.

Table 2.2

Summary of literature on fiscal deficit effects on the current account

Authors/ Year	Period	Objective	Country Detail	Estimation Model	Econome-tric Tool	Comment/ Findings
Aghevli and Sassanpour (1982).	1960-1977	Investigate the consequences of an increase in the crude oil prices in the Iranian economy	Iran	Macroecon-omic model	OLS and Simulation	Increased government expenditures caused by increase oil revenues also led to increase imports demand thereby worsen the balance of payments.
Zaidi (1985).	1972-1980	Examines how fiscal policy is related to balance of payment	12 develop-ing countries	Bivariate Granger-Causality models	Granger-Sims causality tests.	For Thailand & Greece, unidirectional causality runs from the current account deficit to budget deficit. For Philippines & South Korea a bi-directional causality exists. For Brazil, no relationship.
Vaez-Zadeh (1989).	1965-1981	Examines the oil wealth and economic behaviour.	Venezue-la	Simultaneo-us model	Two-stage least squares estimation and simulation	There was a great adverse effect of higher oil revenues when the oil wealth effect was considered.
Islam (1998).	1973:1 - 1991:4	Examines how budget deficits was related to trade deficits	Brazil	Bivariate Granger-Causality models	Granger Causality test	Bilateral causality exists between trade deficits and budget deficits.

Table 2.2 (Continued)

Authors/ Year	**Period**	**Objective**	**Country Detail**	**Estimation Model**	**Econome-tric Tool**	**Comment/ Findings**
Mansur (1989).	1970-1982	Investigates how government fiscal operations, domestic credit, current account and money supply are related	Philippi-nes.	Structural model of price, revenue, import, income and private sector absorption	OLS and Simulation	Current account worsens when bank credit and external borrowing are used to finance an enlarged budget deficit.
Bartoli (1989).	1970-1982	Investigates the consequences of budget deficit on the balance of payment.	Ten Latin Americ-an countries	Structural model of budget deficit on the balance of payment	Two stages least square (2SLS) technique	Financing approach to budget deficit adversely influences domestic savings to the extent of deteriorating the current account deficit.
Khalid and Guan (1999)	1950-1994	Examine how budget deficit is associated with the current account deficits in a chosen sample of five developed countries	Five develop-ed and Five develop-ing countries .	Bivariate Granger-Causality models and Error correction model	Johansen co-integration method	Budget and current account deficits have association in four out of five develop-ing countries but for the advanced country no such relation -ship is reported.
Akbostancı and Tunc (2002).	1987-2001	Examine the linkages between budget deficit and the trade deficit for Turkey	Turkey	Error correction model	Johansen Co-integration method and error correction mechanism	The twin deficits hypothesis holds, and the Ricardian equivalence hypothesis is not valid

Table 2.2 (Continued)

Authors/ Year	Period	Objective	Country Detail	Estimation Model	Econome-tric Tool	Comment/ Findings
Saleh, Naair, and Agalewatte, (2005).	1970-2003	Investigate the existence of the long run relationship between the current account deficit and budget deficit in Sri Lanka	Sri Lanka	Autoregress-ive distributive model	ARDL bounds test for co-integration	Findings support the Keynesian view that there exists a long run relationship between the two deficits, and budget deficit causes the current account deficit.
Pahlavani and Saleh (2009).	1970-2005	Investigate how the budget deficit and current account deficits were associated.	Philippi-nes	Bivariate Granger-Causality models	Granger causality approach	There is existence of bidirectional causality between budget deficits and current account deficits.
Anoruo and Ramchander (1998).	Data ranged from 1957-1993	Investigate trade deficit and budget deficit for five Southeast Asian countries	India, Indonesi a, Korea, Malaysia and Philippi-nes.	Vector Autoregress-ive models	Granger causality test	Causality runs from trade deficit to budget deficit but not from the budget deficit to trade deficit.
Arize and Malindreto (2008).	1973:2 - 2005:4	Examine the long run association of trade deficits with budget deficits.	10 African countries	Autoregress-ive Fractionally Integrated Moving Average (ARFIMA) model.	Co-integration and Granger causality approaches	Bidirectional long-run causality between the two deficits was strongly supported while unidirection-al causality is found in the short run.

Table 2.2 (Continued)

Authors/ Year	**Period**	**Objective**	**Country Detail**	**Estimation Model**	**Econome-tric Tool**	**Comment/ Findings**
Onafowora and Oluwole. (2006).	1970-2005	Examine the existence of the "twin deficits" in an oil dependent economy of Nigeria.	Nigeria	Vector error correction model	Co-integration and Granger-Causality tests and generalized impulse response	In both the short- run and long-run, trade and budget deficits are positively related and there is a unidirectional causality from Trade deficit to Budget deficit.
Soludo (1997).	1970-1995	Investigates the fiscal approach to the balance of payments in Nigeria	Nigeria	Error correction model.	Error correction mechanism and simulation	Fiscal deficit is better for growth, export and trade and current account balances under the tight measures for minimizing importation.
Olopoenia (1991).	1970-89	Examines the fiscal response to oil wealth and balance of payments performance in Nigeria	Nigeria	Structural macro-economic model	Ordinary least square and Simulation approach	Government's fiscal behaviour was responsible for the current account balance at the period of the oil boom.
Ariyo and Raheem (1991).	1970-1990	Investigate the impacts of fiscal deficit on some macroeconomic aggregates in Nigeria.	Nigeria	Macro-economic model	Ordinary least square and simulation techniques	Large budget deficit positively affects major macro variables except the current account balance.

Table 2.2 (Continued)

Authors/ Year	Period	Objective	Country Detail	Estimation Model	Econome-tric Tool	Comment/ Findings
Egwaikhide (1997).	1973-1993	Examines the effects of budget deficits on the current account balance in Nigeria	Nigeria	Macro-economic model	OLS and simulation methods	Budget deficit worsens the current account irrespective of whether it is financed by the bank credit or external borrowing.
Egwaikhide (1999).	1973-1993	Examines the impacts of budget deficit on trade balance in Nigeria.	Nigeria	Macro-economic model	OLS and simulation methods	Budget deficit due to rising government expenditure negatively affects the balance of trade.
Omankhanlen and Mukoro (2011).	1986-2007	Examine the extent to which the monetary approach to balance of payment explains the developments in the current account in Nigeria.	Nigeria.	Macro-economic model	OLS method	GDP positively and significantly affects current account balance. Domestic credit and government expenditure are also significant.
Piersanti (2000).	1970-1997	Investigates the link between current account deficits and expected future budget deficits.	Seventeen OECD countries	Optimizing general equilibrium model	Granger–Sims causality	Evidence strongly supports the view that current account deficits have been associated with expected future budget deficits

Table 2.2 (Continued)

Authors/ Year	**Period**	**Objective**	**Country Detail**	**Estimation Model**	**Econome-tric Tool**	**Comment/ Findings**
Abell (1990).	1979-1985	Investigates the link between fiscal deficit and current account deficit	United State	Vector Autoregressive model	Granger causality	Fiscal deficit and current account deficit are found to be positively related.
Bundt and Solocha (1988).	1973–1987	Examine the relationship between the budget deficit and trade deficit in the United States	United States	A general two-country portfolio-balance model.	Granger causality	There is positive linkage between the budget deficit and the trade deficit arising through the exchange rate.
Kearney and Monadjemi (1990).	1972:1-1987:2	Examine the international evidence from eight countries using quarterly data during the flexible exchange rates	Argentina, Britain, Canada, France, Germany, Ireland, Italy, and United States.	Autoregressive model	Vector autoregressive (VAR) technique	Provide evidence of temporary twin deficits association which is different from the government's financing decision.
Vamvoukas (1997).	1948-1993	Examines the association between government budget and trade deficits	Greece	Bivariate model and Error-correction modelling	Co-integration analysis, and Granger causality	The results support the Keynesian proposition in the short and long run and there is one-way causality from the budget deficit to trade deficit.
Samadi (2006).	1956-2003	Analyzes the long and short run association between budget deficit and trade deficit.	Iran, Jordan, Kuwait, Morocco, Oman, Tunisia	Error-correction model	Co integration analysis, and Granger causality	Provides evidence in support of the Richardian equivalence.

Table 2.2 (Continued)

Authors/ Year	**Period**	**Objective**	**Country Detail**	**Estimation Model**	**Econome-tric Tool**	**Comment/ Findings**
Enders and Lee (1990).	1947-1987	Test the Richardian equivalence hypothesis that no relationship exist between budget and trade deficit	United States	Micro-theoretic model	Vector autoregressive (VAR) technique	Finding provides evidence in support of Richardian equivalence that no relationship exist between budget and trade deficit.
Morgan (1979).	1972-1978	Shows how budgetary development and domestic liquidity, aggregate demand and the balance of payment are interrelated	12 oil-exporting countries	Analytical model of domestic liquidity, aggregate demand and the balance of payment	Least square method	The domestic budget balance is the primary determinant of movements in domestic liquidity in oil-exporting countries

2.3.3 Literature on monetary approach to overall balance of payment

Under the monetary approach to balance of payment, a reserve flow equation is often used to measure the effect of disequilibrium in money market arising from excess money supply where money demand remains constant. The effect of this phenomenon is reflected in the reserves position of a country given the fixed exchange rate system. A reserve flow equation has net foreign reserve or net foreign asset as its endogenous variable and the choice of exogenous variables may range over income level, interest rate, price level, exchange rate, government spending, money multiplier and domestic credit depending on the theory. Many studies have been conducted both in developed and developing countries to test the monetary approach. However, the studies remain inconclusive as the results obtained are not parallel to one another as postulated by the theory.

For example, Chaudhary and Shabbir (2004) use a reserve flow equation to investigate the effect of monetary variables on the Pakistan's balance of payments and also test the exogeneity of monetary variables. Results indicate that balance of payments is influenced by monetary variables and that monetary policy improves the external sector if used. It was shown that when the level of price and real income rise, inflow of international reserves increase as well. Conversely, as the interest rate, money multiplier and domestic credit increase, outflow of foreign reserves increase. There is evidence of partial sterilization in the short run and no sterilization effect in the long run on the external reserve trends. The results imply that as public deficit increases, domestic credit creation also increases thus causing a loss of external reserves.

Samimi, Fakhrehosseini and Azizi (2009) employ reserve flow equation to investigate the Keynesian and monetary approach to the balance of payments of Iran by conducting test of regressors signs correction and speed of adjustment test. Findings indicate that signs of regressors of the equation of balance of trade go against the Keynesian and Monetary perspectives. On the other hand, regressors' signs of equation of the official reserve transactions balance agree with Keynesian and Monetary perspectives. In term of adjustment speed, official reserve transactions balance is quicker than the trade balance, which implies that the official reserve transactions balance is independent while the trade balance account accommodates.

In addition, Dhliwayo (1996) uses a reserve flow equation to examine the monetary approach to balance of payments in Zimbabwe in order to find out the effect of excess supply of money over the period ranging from 1980 to 1991. By employing co-integration and error correction model, findings reveal that money perform an important function in balance of payment determination. A one-to-one strong negative association of domestic credit with foreign reserves flow is found. It is concluded that with demand for money remaining constant, imbalance in the balance of payments can be improved by implementing a right monetary targeting and financial programming.

Ardalan (2003) analyses the Keynesian theory (elasticity and absorption) and the monetary approach as different theories of balance of payments adjustments. The trade balance with unused resources is dealt within the two approaches namely, elasticity and absorption while attention is paid to balance of payment in respect of the money account with full employment under the monetary approach. Under the monetary approach, the role of money market in the economy with respect to money demand and money supply is stressed.

Another study by Khan (2008) uses a reserve flow to investigate the monetary approach to the Pakistan's balance of payments during 1962 to 2005 by employing Full Modified ordinary least square and the method of co-integration. It is found that real output, real exchange rate and domestic credit are very significant in predicting international reserves in both the short and long run. It is also reported that causality runs from international reserves to domestic credit in the long run. The results imply that for the monetary approach to the balance of payments to be valid and for monetary policy to be effective, it depends on how the function of money demand is stated.

Study conducted by Fleermuys (2005) also uses a reserve flow equation to investigate the Namibia's monetary approach to balance of payments by testing the effect of excess money supply during 1993 to 2003. By employing co-integration tests and error correction model, findings indicate a significant positive association between inflation and net international assets; a strong negative association of domestic credit with the net international assets as hypothesized by the monetary approach. Findings imply that though monetary approach play important roles, yet balance of payment could not be taken solely as a monetary phenomenon and hence imbalances in external sector cannot be improved by monetary policy only.

Furthermore, Umer, Muhammad, Abro, Sheikh and Ghazali (2010) investigate the monetary approach to balance of payments by using a reserve flow equation and test the effect of excess supply of money in Pakistan during 1980 to 2008. Findings indicate a strong positive association of gross domestic product growth rate with the net foreign assets; a negative association of domestic credit with net foreign assets; a strong negative association of interest rate with net foreign assets as hypothesized by the monetary approach. It Is concluded that the balance of payments could not be taken as monetary phenomenon completely and thus imbalances in balance of payment cannot be remedied solely with monetary policy.

A study carried out by Korsu (2009) examined how fiscal deficit has affected the external sector of Sierra Leone over the period 1971 to 2005 by using a reserve flow equation. The study employed a simultaneous three stages least squares method for the equations of money supply, price level, real exchange rate and the overall balance of payments. It also carried out counterfactual policy simulation. Findings suggest that fiscal restraint will enhance the performance of the external sector of Sierra Leone through decreasing money supply and the price level. To achieve this, there is a need for a reduction in the budget deficit of Sierra Leone to a sustainable level. Other studies with positive results include Courchene and Singh (1976) for 14 industrial countries; and lastly, Akhtar, Putnam, and Wilford (1979) for United Kingdom.

Bilquees (1989) has employed a reserve flow equation with respect to the theory of monetary approach to balance of payment to examine its hypothesis on Pakistan data by making use of the same model applicable to 39 developing countries based on cross section. Finding shows that the version of the monetary approach to balance of payment fails to explain the movement of reserve in the country. Similarly, Feige and Johannes (1981) conducted tests on the association of the domestic credit with the components of reserve of Australia, Belgium, France, Germany, Norway, and Sweden monetary base within the context of the theory of balance of payments by using the Haugh test, the Granger test, and the Sims test. Findings of the test showed that the direction of causality was not from domestic credit to reserves as hypothesized by the theory.

Results of some studies with respect to the hypotheses of the monetary approach to balance of payment have been mixed. For example, Silumbu (1995) employs the reserve flow equation to examine the impacts of relative prices and domestic credit control on the Malawi's balance of payment over the period 1970-1990. Findings reveal that relative price has negative association with the balance of payments, which implies that the influence of relative price dominates that of money demand. Both nominal and real exchange rates cause loss of reserve due to devaluation. The effect of domestic credit was also negative initially after which it was positive signalling that selective credit policy was appropriately formulated to enhance export in plantation sector. Sterilization was not supported yearly except quarterly and was weak. A unidirectional causation was also reported from credit to reserves yearly but it was bidirectional quarterly.

In another study with similar results, Connolly and Taylor (1976) utilized a reserve flow equation to examine the monetary approach to devaluation for 18 developing countries and found the regression coefficients closed to one for increase in domestic credit growth rate. In addition, result showed that variation in domestic credit growth was significant, thus rejecting the nonmonetary hypothesis. This implies that aspect of domestic credit of the monetary model is evidently supported. However, with regard to devaluation, the regression coefficients indicated the rejection of the hypothesis that devaluation never influenced the improvement in the balance of payment. It is concluded that the finding on the rate of devaluation is somehow mixed.

Another approach to estimate the balance of payment under the fixed exchange rate system is capital flow equations. In this approach the main motivating factor in the balance of payments transaction is a private capital inflow. This equation has the net private capital inflow or net private short-term capital inflow as its endogenous variable while the exogenous variables consist of current account balance in addition to net official capital inflow, net private long-term capital inflow and some explanatory variables in the equation of reserve flow. Some empirical studies have also been conducted using the capital flow equation. These studies, for examples, include the study of Devereux and Sutherland (2009) for 17 OECD countries with United States inclusive, Hau and Rey (2006), Kour and Porter (1974) for Australia, Italy, Netherlands, and Germany, and Obstfeld, Shambaugh, and Taylor (2005) for 103 countries. The results of these studies reported are mixed.

The equation of reserve flow and that of capital flow are empirically employed by these studies to examine the hypothetical theory of the monetary approach to balance of payment. It therefore follows that in a country operating a fixed exchange rate system, the reserve flow and capital flow equations are better employed in investigating the hypothetical theory of monetary approach to balance of payment. Where the floating exchange rate is in practice, exchange rate equation is better used, with the exchange rate serving as exogenous variable.

In another development, Girton and Roper (1977) extended the monetary model to incorporate the reserve flow and exchange market equations, and this is known as Exchange Market Pressure (EMP) equation in the literature. The EMP is the dependent variable defined as the addition of the variation in reserves and variation in exchange rates. This equation is applicable to the country's data operating fixed, freely floating and managed floats exchange rate system. Therefore, many studies have been carried out both in developed and developing countries using the EMP equation.

For example, Girton and Roper (1977) employ the application of exchange market Pressure model to the post-war period experience in Canada and they conclude that the sum of variation in reserves and variation in exchange rates can be rightly employed as endogenous variable to find out the amount of intervention needed to realize different exchange rate desired.

Connolly and da Silveira (1979) also employ the application of exchange market pressure model to the Post-war Brazil where for some years, tensions in exchange market have been abated considerably by means of both reserve variation and exchange devaluation. The exchange rate pressure model was concluded to have demonstrated well during the period but never performed to expectation at the early year till 1961 due to large constraints on exchange.

In order to examine the Korean experience, Kim (1985) applies exchange market pressure model on the basis of monetary approach to balance of payment and exchange rate determination over the period 1980 to 1983. Findings from the regression analysis indicate that domestic credit rate is strongly and negatively related to the rate of variation in exchange market pressure. In addition, it was shown that the measurement of exchange market pressure never relied upon foreign exchange and international reserves. There was also indication that greater percentage of exchange market pressure was relieved through international reserves variation. It supports the concern of government over inflation as well as over the burden of debt impact, resulting from exchange rate depreciation.

In a study on Canada, Burdekin and Burkett (1990) investigate the extent to which exchange market pressure model has performed in the short run without restricting dynamics. It is found that domestic credit affects exchange market pressure negatively and interestingly, the relevance of policy with respect to the monetary model is completely supported.

Diamandis, Georgoutsos and Kouretas (1996) employ Johansen's multivariate co-integration approach and Hansen-Johansen recursive tests to investigate the determinants of monetary model of exchange-rate during the floating exchange rate system, the existence of co-integration between the variables, and the existence of speculative bubble by using the Canada and U.S. exchange rate. Results show that monetary model when not restricted explains the present of co-integration between the Canada and US dollar rate. There is also a support for validity of co-integration of the monetary model. However, there is no proof of speculative bubbles from the test conducted.

A study by Kamaly and Erbil (2000) employ vector auto-regression (VAR) to measure exchange market pressure in three countries, namely, Egypt, Turkey and Tunisia. Finding with respect to these countries are mixed. A method of VAR is also employed by Tanner (2001) to determine the association of exchange market pressure on monetary policy such as domestic credit variation and the differences in foreign and domestic interest rate over the 1990 to 1998. Countries which data are tested are Indonesia, Brazil, Thailand, Chile, Korea, and Mexico. Findings reveal that a non expansionary monetary policy relieves exchange market pressure despite the fact that a rise in the exchange market pressure tends to increase the growth of domestic credit in those countries. Tanner's results were mixed but not as mixed as that of Kamaly and Erbil's.

For seven European Union, Pentecost, Van Hooydonk and Van Poeck (2001) examine exchange market pressure model during 1980 to 1994 by employing principal components analysis for the exchange market pressure measurement instead of summing the variation in both exchange rate, and in reserves. Wealth has been added to the monetary model in the analysis of trends in exchange market pressure measurement. Findings suggest that changes in money stock, interest rate variation, devaluation of exchange rate, current account and the fiscal deficit can account for exchange market pressure for five members of the Union.

Tanner (2002) employs a vector auto-regression to measure the exchange market pressure on a monthly data of 32 developing countries over the period 1993 to 2000. Findings show that exchange market pressure is not explained by both the lagged of domestic money growth and that of rate of interest differential based on the hypothesis. The impulse response functions indicate that the lagged money supply shock and that of interest rate differential shock is positively and negatively related to exchange market pressure, respectively.

In a study of Phillipines conducted by Gochoco-Bautista and Bautista (2005), a VAR method of estimation was used to examine the association of monetary policy with the exchange market pressure by testing and comparing the findings obtained from the period preceding the currency crises and period after. The study which covers a period from 1997 to 1998 reveals contradictory findings from the response of monetary policy to exchange market pressure during the crisis. The interest rate is found to positively and negatively impact exchange market pressure during the crisis period and after, respectively.

Bielecki (2005) employs the index of exchange market pressure to explain the regime of Polish exchange rate over the period 1994 to 2002. Comparison of the of exchange market pressure was made by employing intervention via variation in international reserve on one hand and foreign exchange on the other. By estimating linear monetary model of exchange market pressure, the performance of narrower index is not better than that of broad index. Vector auto-regression model indicates that the monetary authorities in Poland engage in a strong sterilization over sub period in the sample that comes first.

Monetary model of exchange rate pressure is also applied by Parlaktuna (2005) to Turkey over the period 1993 to 2004. Findings confirm a high negative association of domestic credit with exchange market pressure. It is also found that the monetary authorities of Turkey absorb the larger proportion of the exchange pressure by given up its international reserves.

In a study of Ghana by Ghartey (2005), it is found that the monetary authorities in Ghana absorbs exchange pressure by given up net foreign assets and depreciation with the latter receiving the tension of the pressure. Variation in domestic credit, prices and real income are reported to have made domestic currency to depreciate, while foreign inflation greatly appreciates it. It is suggested that monetary authorities in the country should amass net foreign asset to use sterilized interventions in addressing the depreciation of the domestic currency, adopt inflation target system and be committed to sustain fiscal discipline.

Van Poeck, Vanneste, and Veiner (2006) examine the role of institution in exchange market pressure in the Central and Eastern European Countries. Findings show that institutional enhancements like liberalizing economy, enhancing corporate governance, enhancing rule of law, reforming banking sector, and corruption reduction greatly lessen the effect of increase domestic credit and inflation on the exchange market rate in these countries. Countries practicing flexible exchange rate system are found to be less faced with the brunt as compared to countries with managed float system, thus confirming the bi-polar perspective over the exchange rate systems for these economies.

In the work of Stavarek (2006), a model dependent method of Weymark (1995) was employed to measure exchange market pressure for the four European Union, namely Hungary, the Czech Republic, Slovakia, and Poland over the period 1993-2005. Findings of two-stage least square regression technique (2SLS) indicate that the index of exchange market pressure for these countries over the period of flexible exchange rate system proves to be more stable as compared to the period when the fixed exchange rate system is being operated.

Garcia and Malet (2007) use vector auto-regression (VAR) to examine the relationship between the measure of exchange market and monetary policy over the period 1993 to 2004 in Argentina. By following the traditional approach, the study differs by including the growth of output as another explanatory variable. Findings indicate a positively bidirectional association between domestic credit and exchange market pressure. It is found that the role played by growth of output outweighs those of interest rate and domestic credit in determining exchange market pressure. The output growth is also found to have been impacted negatively by exchange market pressure.

A regression of Exchange market pressure on current account balance, growth rate of domestic credit, real depreciation rate, government borrowing growth rate and inflation differential based on panel data is employed by Van Poeck, Vanneste, and Veiner (2007) to investigate the bipolar perspective for the Central Eastern and European Countries. The authors pay attention to exchange market pressure as a sign of being liable to currency crisis. It is suggested that Central Eastern and European Central Countries should ensure that finances and inflation have been brought to control before going for a quasi-fixed exchange rate regime. For the eight European Union member countries, a bipolar perspective on exchange rate system exists such that countries with intermediate regime of exchange rate are more vulnerable to exchange market pressure than countries with fixed or floating regime.

A study by Stavarek (2007) estimates exchange market pressure for four European Union currencies by utilizing Weymark, 1995 model-dependent approach and Eichengreen, et al. (1995, 1996) model independent approaches over 1993 to 2006. The results found were opposite and the elasticity coefficients of the exchange rate in relation to domestic credit are not significant. The sizes of the estimated coefficient were consciously depended on the instrumental variable employed. Furthermore, the exchange market pressure found in Hungary is in excess at the time of fixed system and in Poland during the crawling fix period.

In a study of Fiji Island, Jayaraman and Choong (2008) apply autoregressive distributed lag (ARDL) approach to examine the relationship among EMP, fiscal deficit, foreign debt and private sector's domestic credit. Also included in the regression is the uncertainty variable to test the relation of political uncertainty with the speculative shock on currency. The study further investigates the presence of long run relationship and conducts Granger-causality tests between the variables. Results show the presence of co-integration between EMP and fiscal deficit, political uncertainty, private sector domestic credit, foreign debt. In addition, their results indicate that EMP has positive association with fiscal deficit, private sector domestic credit, foreign debt and speculative pressures.

A vector autoregressive method of estimation was employed by Hegerty (2009) to evaluate the influence of capital inflows to exchange market pressure and domestic credit growth in four new EU member states operating pegged exchange rate system. Evidence was provided that capital inflows, especially portfolio inflows as well as investment lessened exchange market pressure in three countries.

Recently, in a study of Turkey, Feridun (2009) examines the proposition that speculative pressure is associated with real exchange rate appreciation, fragility in banking sector, and foreign reserves by employing the method of autoregressive distributed lag and Granger causality over the period August 1989 to August 2006 for Turkey. Findings indicate that in the long run, exchange market pressure is associated with the real exchange rate appreciation, fragility in banking sector, and foreign reserves. Furthermore, the short and long run causality tests inform bidirection in which case the exchange market pressure is caused by real exchange rate appreciation, fragility in banking sector, and foreign reserves while fragility in banking sector in turn is caused by the exchange market pressure.

For the Czech Republic, Kemme and Lyakir (2009) use vector auto-regression (VAR) to estimate the exchange market pressure during the period 1995 to 2006 over which there had been movement from fixed exchange rate to a monetary policy of targeting inflation. For the pegged system (1995 to1998) interest rate and domestic credit were found to have negative significant reactions to exchange market pressure. For the inflation target period (1998 to 2006) where exchange rate was not fixed, it was found that variation in interest rate was associated with the tensions in exchange market pressure, instead of variation in domestic credit in reaction to tensions. This implied that inflation target was the focus of monetary authorities.

In new EU member states and EU candidates, Maret (2009) examines the association of exchange market pressure and the quality of institutional framework. The roles of domestic credit as well as that of inflation differential have been reported to have been significant in analyzing exchange market pressure. Also floating exchange rate system causes minimum exchange market pressure. In addition it is reported that effective rule of law, corruption control, financial market efforts and reforms of enterprise sector considerably lessen exchange market pressure in new EU member states..

More recently, Gawroska-Nowak and Grabowski (2011) employ co-integration technique to estimate exchange market pressure in Slovakia prior to becoming the Euro zone member over the period 2003 to 2008. Findings show that foreign exchange interventions, speculative attacks and remedy made following devaluation of the Euro lead to excessive values of exchange market pressure measured.

In another study, Aizenman, and Hutchison (2012) examine the extent of the impact of the global financial crisis on exchange market pressures and find out the means of absorption over the period 2008-2009. Findings show that emerging markets having greater international liabilities such as debt, equities, foreign direct investment and derivative products are more liable to the financial crisis. Furthermore, countries having greater external portfolio liabilities more than foreign reserves relieve the global shock by given way for large depreciation of exchange rate and less loss in reserve. It is concluded that in spite of foreign reserve amassed by emerging markets before the financial crisis, countries still depend mainly on exchange rate devaluation instead of loss in reserve to absorb greater percentage of tensions by exchange market pressure.

By adopting monetary approach, Jie (2011) comes up with a formula in respect of Exchange Market Pressure Index under capital control. This is followed by test to determine how the old Exchange Market Pressure Index is different from the new one. By employing a simulation method over the China data for the period 2000 to 2008, the study's finding reveals that on the average, the actual foreign exchange market pressure is overestimated by the old Exchange Market Pressure Index by 91%.

2.3.3.1 Evaluation of the methodology of the studies reviewed

Many studies have been conducted to examine the monetary approach to the overall balance of payment using different models and techniques of estimation. The techniques of estimation have the tendency of influencing the robustness of the results obtained as each of the method has it associated problem. For example, by using the reserve flow model in the investigation of monetary approach to overall balance of payment, some studies (Fleermuys, 2005; Umer et al., 2010) have employed the Engle and Granger co-integration and error correction mechanism to examine the relationship among the variable. The Engle and Granger co-integration approach is weak in that the maximum co-integrating relationship that can be estimated is only one irrespective of the number of variables in a system. Where there are multiple co-integrating relationships it becomes difficult to either know the presence of others or determine the strength of co-integrating relationships. Besides, simultaneous equation bias could occur due to small sample problem (Brooks, 2008). However, error correction mechanism has the strengths of being modelled with respect to first differences which get rid of trends from the variable included, in which case they neutralize the problems associated with spurious regressions and the one with endogeneity (Asteriou & Hall, 2007). Some other studies (Diamandis, Georgoutsos & Kouretas, 1996; Gawroska-Nowak & Grabowski, 2011) have used EMP model while Dhliwayo (1996) used reserve flow model to determine the monetary approach to overall balance of payment by employing dynamic estimation technique of Johansen co-integration and error correction mechanism. The method of Johansen as compared to Engle and Granger provides a number of co-integrating equations and estimates of all co-integrating vectors in the multivariate case. The Johansen approach shows the process of adjustment of the system from the short run dynamics to long run equilibrium. This makes it more appropriate than the Engle and Granger method (Brooks, 2008).

To estimate the reserve flow model, the study by Feige and Johannes (1981) has employed Granger and Sims causality approaches. These give room for the detection of the directions of causation between the variables. However, because Sims approach makes use of more regressors resulting from the addition of leads terms unlike the Granger's approach, the technique causes more degrees of freedom to be lost as it consumes larger number of it (Asteriou & Hall, 2007)

The method of simultaneous has been used by Korsu (2009) and Silumbu (1995) in estimating the reserve flow model and by Stavarek (2006, 2007) in estimating EMP model. All the studies used 2SLS with the exception of Korsu (2009). The main weakness of 2SLS is that it is not more efficient asymptotically because 2SLS neglects any information that could be available with respect to the error covariance as well as supplementary information which dependent variables of other equations could have (Books, 2008). However, 3SLS has the strength of giving room for someone to put into account all a-priori restriction intrinsic to the specification (Aghevli & Khan, 1978). The method makes necessary correction for the possible cross-equation autocorrelation and in the process of estimation, three stages least squares give the step three which permits non-zero covariance between the disturbance terms in the structural equations and it is more efficient asymptotically (Books, 2008).

Analysis of the monetary model of Exchange Market Pressure has been done by some studies (Devereux & Sutherland, 2009; Jie, 2011) through the application of simulation approach. Simulation approach has the strength to be applied to virtually all social sciences and is capable of processing complicated inputs through its consideration of systems' proposition and then generates their effects as prediction. The outcomes of simulation are commonly quite sensitive to the model's detail. However, simulation is weak in the sense that its identity is little as a field in its own right (Axelrod, 2003).

Many studies (Akhtar, Putnam & Wilford, 1979; Bilquees, 1989; Chaudhary & Shabbir, 2004; Connolly & Taylor, 1976; Courchene & Singh, 1976) have used reserve flow model and one study (Kouri & Porter, 1974) has used capital flow model, while some other studies (Aizenman & Hutchison, 2012; Burdekin & Burkett, 1990; Connolly & da Silveira, 1979; Girton & Roper, 1977; Kim, 1985; Parlaktuna, 2005; Pentecost, Van Hooydonk & Van Poeck, 2001) have used exchange market pressure (EMP) model to examine the monetary approach to overall balance of payment. These studies employed ordinary least square (OLS) method for their estimation without taking into consideration the possibility of endogeneity between foreign reserves and domestic credit. Other studies (Hau & Rey, 2006; Maret, 2009; Van Poeck, Vanneste & Veiner, 2006, 2007) have employed Panel regression based on pooled OLS. It has been argued that if there is sterilization by the monetary authority, there is possibility of feedback between EMP and domestic component of monetary base and for that reason, using OLS is not properly right because of endogeneity problem (Kemme & Lyakir, 2009; Tanner, 2002).

Studies by Khan (2008) and Ghartey (2005) employed fully modified ordinary least squares (FMOLS) of Phillips and Hansen (1990) and the dynamic ordinary least squares (DOLS) of Stock and Watson 1993 respectively, for the estimation of EMP. The dynamic nature of the method addresses the endogeneity problem associated with sterilization by the monetary authority. The leads and lags regression incorporated in the model has the fundamental objective of obtaining efficient parameter estimates with normal distribution (Choi & Kurozumi 2008).This arrangement solves the problems associated with endogeneity and biasness associated with small sample, thus making the estimates to be robust (Stock & Watson, 1993).

In order to deal with the problem of endogeneity, some studies have also resorted to other dynamic estimation procedure. For example, some studies (Bielecki, 2005; Garcia & Malet, 2007; Gochoco-Bautista & Bautista, 2005; Hegerty, 2009; Kamaly & Erbil, 2000; Kemme & Lyakir, 2009; Tanner, 2001, 2002) on the examination of the monetary approach to overall balance of payment via the EMP model have employed the vector autoregressive (VAR) method. This dynamic method (VAR) has the strength of correcting for the problem of endogeneity and could serve to produce impulse response function to indicate the reactions of individual endogenous variable to shock of deviation of other dependent variable over some particular period (Kemme & Lyakir, 2009; Tanner, 2002).

Some studies (Feridun, 2009; Jayaraman & Choong, 2008; Obstfeld, Shambaug & Taylor, 2005) have employed autoregressive distributed lag (ARDL) bound test co-integration approach and error correction mechanism for the estimation of EMP monetary model. The method of bounds testing possesses better properties that accommodate small sample size more than the Engle and Granger (1987), and Johansen and Juselius (1990) procedure of co-integration (Narayan & Smyth, 2005). The approach of ARDL also gives room for different optimum lags to be assigned to variables which cannot be possible while using the conventional approaches to co-integration. In addition, the ARDL approach makes use of single reduced form equation as compared to the convectional approach of co-integration where estimation of long run associations is done within a system equation (Ozturk & Acaravci, 2010).

By taking into consideration the possibility of the problem of endogeneity between the foreign reserves and domestic credit, biasness associated with small sample, and to ensure that the estimates is robust, the current study follows Ghartey (2005) by employing the dynamic ordinary least square (DOLS) of Stock and Watson (1993) for the estimation of monetary model of exchange market pressure. The dynamic nature of the method addresses the endogeneity problem associated with monetary model of exchange market pressure and domestic credit in case the monetary authorities resort to sterilization (Stock & Watson, 1993).

Table 2.3 presents the summary of reviewed empirical literature on monetary approach to overall balance of payment (Using foreign reserves flow model, Capital flow model, and Exchange Market Pressure model).

Table 2.3

Summary of literature on monetary approach to balance of payment

Authors/ Year	Period	Objective	Country Detail	Estimation Model	Econome-tric Tool	Comment/ Findings
Chaudhary and Shabbir (2004).	1965-1999	Investigate the effect of monetary variables on the Pakistan's balance of payments and also test the exogeneity of monetary variables.	Pakistan	Monetary model of the balance of payments (reserve flow equation)	Simple Ordinary least squares	When the level of price and real income rise, inflow of international reserves also increases. Conversely, as interest rate, money multiplier and domestic credit increa-ses, outflow of foreign reserves increases.
Samimi, Fakhrehossein i, and Azizi (2009.	Not available	Investigate the Keynesian and monetary approach on the balance of payments of Iran	Iran	Almon or Polynomial Distributed Lag (PDL) model (reserve flow equation)	Test of regressors signs correction and speed of adjustment test	Balance of trade sign of regressors is against the Keynesian and Monetary views while that of the official reserve transactions balance (ORTB) agrees with the two views.
Dhliwayo (1996).	1980-1991	Examines the monetary approach to balance of payments in Zimbabwe in order to find out the effect of excess supply of money	Zimbabw e	Multivariate monetary model. (reserve flow equation)	Co-integration and error correction mechanism	There is One-to-one strong negative association of domestic credit with foreign reserves flow

Table 2.3 (Continued)

Authors/ Year	Period	Objective	Country Detail	Estimation Model	Econome-tric Tool	Comment/ Findings
Khan (2008).	1962-2005	Iinvestigates the monetary approach to the Pakistan's balance of payments	Pakistan.	Model of demand for money and the supply of money. (reserve flow equation)	Full Modified ordinary least squares and the method of co-integration.	Real output, real exchange rate and domestic credit are very significant in predicting international reserves in both short and long run.
Fleermuys (2005).	1993-2003	Investigates the Namibia's monetary approach to balance of payments by testing the effect of excess money supply.	Namibia	Error correction model. (reserve flow equation)	Co-integration tests and error correction mechanism.	Inflation and net internat-ional assets are positive-ly related, and domestic credit is negatively related with the net international assets.
Umer, Muhammad, Abro, Sheikh, and Ghazali (2010).	1980-2008	Investigate the monetary approach to balance of payments by using a reserve flow equation and test the effect of excess supply of money in Pakistan.	Pakistan.	Error correct-ion modelling (reserve flow equation)	Co-integration test and error correction mechanism	GDP growth rate is positively related to the net foreign assets, while domestic credit and interest rate are negative-ly related to net foreign assets.
Korsu (2009).	1971-2005	Examines how fiscal deficit has affected the external sector of Sierra Leone.	Sierra Leone	Model of money supply, price level, real exchange rate, and a reserve flow equation.	Three Stages Least Squares and Counterfactual policy simulation method.	External sector improves by decreasing money supply and the price level through a reduction in the budget deficit

Table 2.3 (Continued)

Authors/ Year	Period	Objective	Country Detail	Estimation Model	Econome-tric Tool	Comment/ Findings
Courchene and Singh. (1976).	1960:1-1969:2	Examine the extent to which the foreign reserves are changed by the behaviour of the 14 industrial countries	14 industrial countries	Monetary model of money demand and money supply	OLS technique	Results support the hypotheses that form the basis of the analysis and thus buttress the monetary approach to balance of payment.
Akhtar, Putnam, and Wilford (1979).	1952-71	Investigate the effect of fiscal constraints on monetary policy within the realm of the monetary approach to the balance of payment	United Kingdom	Money demand and reserve flow model	Ordinary Least Squares	Government spending increases result in outflow of reserve, and a rise in public borrowing and taxes from the private sector results in inflow of reserve.
Bilquees (1989).	1959-1960 and 1981-1982	Examines the hypothesis of the theory of monetary approach to balance of payment	Pakistan.	Money demand and reserve flow model	Ordinary Least Squares	The version of the monetary approach to balance of payment fails to explain the movement of reserve in the country.
Silumbu (1995).	1970-1990	Examines the impacts of relative prices and domestic credit control on the Malawi's balance of payment.	Malawi	The reserve flow equation and linear money demand models	Two stages least squares (2SLS)	Price has negative effect on the balance of payments. Domestic credit also has negative effect initially after which it was positive

Table 2.3 (Continued)

Authors/ Year	**Period**	**Objective**	**Country Detail**	**Estimation Model**	**Econome-tric Tool**	**Comment/ Findings**
Connolly and Taylor (1976).	1959-1970	Examine the monetary approach to devaluation	18 develop-ing countries	A reserve flow model	Ordinary least squares and Theil (1971) technique	Variation in domestic credit growth was significant, thus rejecting the nonmonetary hypothesis. The finding on the rate of devaluation is somehow mixed.
Feige and Johannes (1981).	Data range from 1950-1978	Test the association of the domestic credit with the components of reserve of the country's monetary base	Australia Belgium, France, Germany Norway, and Sweden	Bivariate and reserve flow model	Haugh test, the Granger test, and the Sims test.	Causality was not from domestic credit to reserves as hypothesized by the theory.
Kouri and Porter (1974).	1960-1972	Examine the effect of change in domestic income, the current account balance, domestic monetary instruments, and Changes in foreign interest rates on capital flow.	Australia , Italy, Germany , and the Netherla nds	A Portfolio Equilibrium Model	Ordinary Lease Squares	Sterilization is possible in these coun-tries, at least in the short run, if the Central Bank is willing to accumulate (or lose) reserves.
Devereux and Sutherland, (2009).	1970-2004	Examine the extent to which the intermediate financial arrangement lies within the two farther ends of portfolio autarky and complete markets.	China and India	Dynamic stochastic general equilibrium model	Linear approximat ion and Simulation methods	A decrease in output volatility domestically decreases gross portfo-lio holdings, as it decreas-es the dome-stic nominal currency bonds' effic-iency in risk sharing

Table 2.3 (Continued)

Authors/ Year	**Period**	**Objective**	**Country Detail**	**Estimation Model**	**Econome-tric Tool**	**Comment/ Findings**
Hau and Rey (2006).	1980-2001	Investigate the correlations of daily, monthly, and quarterly stock index and return on exchange rate	17 OECD countries with United States	A portfolio equilibrium model	Panel regression	A negative correlation was found between returns on the equity of U.S. and the foreign curr-ency returns. The results go against the hypoth-esis that a strong currency follows a strong equity market.
Obstfeld, Shambaug, and Taylor (2005).	1870-1913 1959-1973 1974-2005	Examine the coherence of international interest rate	103 countries	Monetary model of exchange market pressure	Bound test Autoregre-ssive distributive lag method (ARDL)	There is a significant effect of the exchange-rate system over the level where the base interest rate is shadowed by the country.
Girton and Roper (1977)	1954-1974	Employ the application of exchange market Pressure model to the post-war period experience in Canada	Canada	Monetary model of national money demand and supply	Cochrane-Orcutt iterative and OLS technique	It was concluded that the sum of variation in reserves and variation in exchange rates can be employed as endogenous variable to find out the amount of intervention needed to realize different exchange rate desired

Table 2.3 (Continued)

Authors/ Year	**Period**	**Objective**	**Country Detail**	**Estimation Model**	**Econome-tric Tool**	**Comment/ Findings**
Connolly and da Silveira (1979)	1955-1975	Employ the application of exchange market pressure (EMP) model to the Post-war Brazil	Brazil	Monetary model of national money demand and supply	Cochrane-Orcutt iterative and OLS technique	The exchange rate pressure model demo-nstrated well during the period but never performed to expectation at the early year till 1961 due to large constraint on exchange.
Kim (1985)	1980-1983	Examines Korean experience by applying exchange market pressure model on the basis of monetary approach to balance of payment and exchange rate determination	Korea	Monetary model of national money demand and supply	Ordinary Least Squares	Domestic credit rate is strongly and negatively related to the rate of variation in exchange market pressure. The pressure is relieved through international reserves variation.
Burdekin and Burkett (1990)	1963:1-1988:1	Investigate the extent to which exchange market pressure model has performed in the short run without restricting dynamics	Canada	Non-dynamic and dynamic forms of Monetary model of exchange rate	Ordinary Least Squares	Domestic credit affects exchange market pressure negatively and interestingly, the relevance of policy with respect to the monetary model was completely supported.

Table 2.3 (Continued)

Authors/ Year	Period	Objective	Country Detail	Estimation Model	Econome-tric Tool	Comment/ Findings
Diamandis, Georgoutsos and Kouretas (1996)	1970-1994	Investigate the determinants of monetary model of exchange-rate, the existence of co-integration between the variables, and the existence of speculative bubble	Canada and U.S.	Monetary model of exchange rate	Johansen's multivari-ate cointe-gration approach and Hansen-Johansen recursive tests	There was support for validity of cointegration of the monetary model and there was no proof of speculative bubbles from the test conducted.
Kamaly and Erbil (2000)	1970-1995	Measure exchange market pressure in three countries.	Egypt, Turkey and Tunisia	Monetary model of money demand and supply	Vector auto-regression (VAR)	Finding with respect to these countries are mixed.
Tanner (2001)	1990-1998	Determines the association of exchange market pressure with monetary policy such as domestic credit variation and the differences in foreign and domestic interest rate.	Indonesi a, Brazil, Thailand, Chile, Korea, and Mexico	Monetary model of national money demand and supply	Vector auto-regression (VAR)	A non expansionar y monetary policy relieves EMP despite that a rise in the EMP always increases the growth of domestic credit in those countries.
Pentecost, Van Hooydonk and Van Poeck (2001)	1980-1994	Examine exchange market pressure model	Seven European Union,	Monetary model of exchange rate	Principal compon-ents analysis and OLS	Changes in money stock, interest rate variation, devaluation of exchange rate, current account and the fiscal deficit can account for EMP for five members of the Union.

Table 2.3 (Continued)

Authors/ Year	**Period**	**Objective**	**Country Detail**	**Estimation Model**	**Econome-tric Tool**	**Comment/ Findings**
Tanner (2002)	1993-2000	Measures the exchange market pressure	32 develop-ing countries	Monetary model of exchange rate	A vector auto regression	EMP is not explained by both the lagged of domestic money growth and that of rate of interest differential based on the hypothesis.
Gochoco-Bautista and Bautista (2005)	1997-1998	Examine the association of monetary policy with the exchange market pressure	Philipp-ines	Monetary model of national money demand and supply	A vector auto regression method	A contradict-ory finding was found from the response of monetary policy to EMP during the crisis.
Bielecki (2005)	1994-2002	Employs the index of exchange market pressure to explain the regime of Polish exchange rate	Poland	Linear monetary model of exchange market pressure	Vector auto regression	Monetary authority in Poland was found to engage in a strong sterilization over sub period in the sample that comes first.
Parlaktuna (2005)	1993-2004	Tests the proposition of Monetary model of exchange rate pressure to Turkey	Turkey	Monetary model of exchange market pressure	Ordinary Least Squares	Domestic credit was negatively related to EMP and the monetary authority of Turkey absorbed the larger proportion of the exchange pressure by given up its international reserves.

Table 2.3 (Continued)

Authors/ Year	**Period**	**Objective**	**Country Detail**	**Estimation Model**	**Econome-tric Tool**	**Comment/ Findings**
Ghartey (2005)	1963:1 – 2001:4	Investigates the propositions of monetary model of exchange rate and the means by which the country absorbs the exchange market pressure	Ghana	Single equation monetary model of exchange market pressure	Dynamic two-stage least-squares (D2SLS), dynamic least-squares (DLS) and Fully modified Phillip's and Hansen's estimator	Variation in domestic credit, prices and real income causes domestic currency depreciate, while foreign inflation greatly appreciates it.
Van Poeck, Vanneste, and Veiner (2006)	1990-2005	Examine the role of institution in exchange market pressure in the Central and Eastern European Countries.	24 Central and Eastern European Countries.	Monetary model of exchange market pressure	Panel data method of estimation	Countries practicing flexible exchange rate system were found to face less brunt of the EMP as compared to countries with managed float system.
Stavarek (2006)	1993-2005	Measures exchange market pressure for the four European Union	Hungary, Czech Republic, Slovakia, and Poland	Monetary model dependent method of Weymark (1995)	Two-stage least squares regression technique (2SLS)	Index of EMP for these countries over the period of flexible exchange rate system proves to be more stable compared to when the fixed exchange rate system was being operated.

Table 2.3 (Continued)

Authors/ Year	**Period**	**Objective**	**Country Detail**	**Estimation Model**	**Econome-tric Tool**	**Comment/ Findings**
Garcia and Malet (2007)	1993-2004	Examine the relationship between the measure of exchange market and monetary policy	Argenti-na	Monetary model of exchange market pressure	Vector auto regression (VAR)	A positive bidirectional association between domestic credit and EMP exists. The role of output grow-th outweighs those of interest rate and domestic credit.
Van Poeck, Vanneste, and Veiner (2007	1990-2002	Investigate the bipolar perspective for the Central Eastern and European Countries, by paying attention to EMP as a sign of being liable to currency crisis.	Eight Central Eastern and European Countrie s	Monetary model of exchange market pressure	Panel data technique	Countries, with interm-ediate regime of exchange rate are more vulnerable to EMP more than countri-es with fixed or floating regime.
Stavarek (2007)	1993-2006	Estimates exchange market pressure for four European Union currencies	Hungary, the Czech Republic, Slovakia, and Poland	Weymark, 1995 model-dependent and Eichengreen, et al. (1995, 1996) monetary model independent	Two-stage least squares regression technique (2SLS)	Results are opposite and the elasticity coefficients of the EMP in relation to domestic credit are not significant.
Jayaraman and Choong (2008)	1975-2005	Examine the relationship among EMP, fiscal deficit, foreign debt and private sector's domestic credit	Fiji Island	Monetary model of exchange market pressure	Autoregre-ssive distributed lag and Granger-causality tests approach	Cointegrat-ion is found between EMP and each of the variables. Also, EMP has positive relation with domestic credit.

Table 2.3 (Continued)

Authors/ Year	**Period**	**Objective**	**Country Detail**	**Estimation Model**	**Econome-tric Tool**	**Comment/ Findings**
Hegerty (2009)	1995-2006	Evaluates the influence of capital inflows to exchange market pressure and domestic credit growth in four new EU member states	Four new EU member states	Monetary model of exchange market pressure	A Vector Autoregre-ssive method	Capital inflows, especially portfolio inflows as well as investment lessen EMP in three countries.
Feridun (2009)	August 1989 to August 2006	Examines the proposition that speculative pressure is associated with real exchange rate appreciation, fragility in banking sector, and foreign reserves.	Turkey	Monetary model of exchange market pressure	Autoregres sive distributed lag (ARDL) and Granger causality	In the long run, EMP is associated with the real exchange rate appreciation, fragility in banking sector, and foreign reserves.
Kemme and Lyakir (2009)	1995-2006	Estimate the exchange market pressure during the period 1995 to 2006 over which there had been movement from fixed exchange rate to a monetary policy of targeting inflation.	Czech Republic	Monetary model of exchange market pressure	Vector auto regression (VAR)	For the pegged system, interest rate and domestic credit were negatively significant to EMP. For the period exchange rate was not fixed, variation in interest rate was related to tensions in EMP, rather than change in domestic credit to tensions

Table 2.3 (Continued)

Authors/ Year	**Period**	**Objective**	**Country Detail**	**Estimation Model**	**Econome-tric Tool**	**Comment/ Findings**
Maret (2009)	1990-2006	Examines the association of exchange market pressure and quality of institutional framework	Europea n Union member states	Monetary model of exchange market pressure	Panel data technique	The roles of domestic credit and inflation differential were significant in analyzing EMP.
Gawroska-Nowak and Grabowski (2011)	20032008	Estimate exchange market pressure in Slovakia prior to becoming the Euro zone member	Slovakia	Monetary model of exchange market pressure	Cointegr-ation technique	Foreign exchange intervention, speculative attacks and remedy made follo-wing a devaluation of the Euro leads to excessive values of EMP.
Aizenman, and Hutchison (2012)	2008-2009	Examine the extent of the impact of the global financial crisis on exchange market pressures and find out the means of absorption	26 countries	Monetary model of exchange market pressure	Multivar-iate regression analysis (OLS)	The countries depended mainly on exchange rate devalu-eation instead of loss in reserve to absorb greater percentage of tensions by EMP.
Jie (2011)	2000-2008	Determines how the old EMPIndex is different from the new one derived from the monetary approach	China	Monetary model of exchange rate	Simulation approach	On the average, the actual foreign EMP is overestim-ated by the old EMP Index by 91%.

2.4 Concluding Remarks

Evidences have been provided on the effect of inflation on the government deficit and through its financing leads to increase in money supply with further consequence of increasing inflation. However, such results provided by each study have not been parallel to one another. Some of the results are as predicted by the theory while others are not, thus making the studies in this field to be inconclusive. Similarly, the mixed and conflicting results obtained by the previous studies for the causality relationship between money and price level makes the studies inconclusive as well and hence, suggest further investigation by more studies in this area.

The models of Aghevli and Khan (1978) has been applied empirically to many developing countries (Nigeria not inclusive) to test the hypothesis that government expenditure would adjust faster to its desired level than government revenue in response to variation in the level of price. Therefore, the coefficient of adjustment of the former will be greater than the coefficient of adjustment of the latter due to institutional factors with the consequence of public sector deficits. The studies carried out for other developing countries have yielded different results from one another and for this reason Heller (1980) suggested further investigation in the developing countries. Also, the models have not been applied to Nigerian data, and for this reason, this study contributes by applying the models to establish the government deficit and test the proposition for Nigeria.

Researches on the effect of fiscal deficit on current account balance have been conducted both in advanced and developing countries. However, the studies of the balance of payment problem in Nigeria have been very few and there is a need to have more studies in this area bearing in mind the importance of overcoming external imbalances. These previous studies within Nigerian context have largely limited their studies to the current account deficit and never captured the fiscal effects by considering the overall balance of payments. Since, external sector comprises both current and capital accounts, the current study takes into account of overall balance of payment (where the current account and capital account balance measure the country's net purchases of foreign goods and foreign financial assets, respectively) to determine the fiscal policy's impacts on the external sector of the Nigerian economy. In order to bridge this gap, the equation of reserve flow, capital flow, exchange rate (depending on the exchange rate system in operation) and the exchange market pressure equation (all exchange rate systems in operation) can be applied.

From the empirical studies that have used either of these equations: reserve flow, capital flow, and exchange market pressure, to examine the monetary approach to balance of payment, there appears that conclusive results have not been drawn. Similarly, results of studies using the last model, the Exchange Market Pressure (EMP) equation have either been positive, negative or mixed. While many empirical studies have been conducted in both advanced and developing countries to examine the roles of monetary policy in relation to EMP, this model has not been applied in the Nigerian context. Therefore, the current study contributes by applying EMP model on the basis of monetary approach to balance of payment and exchange rate determination to Nigerian data.

CHAPTER THREE

THEORETICAL FRAMEWORK AND RESEARCH METHODOLOGY

3.0 Introduction

The section 3.1 of this chapter presents the theoretical approaches employed in this study. Under this section, the monetary theory of balance of payment and the moenetary theory of exchange rate determination are discussed in subsection 3.1.1 and 3.1.2, respectively. In sections 3.1.3 and 3.1.4, the monetary models of exchange market pressure (EMP) developed by Girton–Roper (1977), and the Aghevli-Khan (1977a; 1978) are respectively discussed. They express the framework upon which the present study's analytical models are based. In section 3.2, the analytical models for the study are presented. Under this section, the government expenditure and revenue models are formulated in subsection 3.2.1 while the money supply model in relation with fiscal deficit and credit creation are presented in subsection 3.2.2. The Granger causality equations and the monetary models of exchange market pressure are presented and discussed in subsections 3.2.3 and 3.2.4, respectively. Section 3.3 deals with the explanation of model interrelationships. In section 3.4, the methods of estimation and test statistics are discussed. Under this section, the unit root and stationary test in subsection 3.4.1 and the methods of testing and estimating parameter in co-integrated systems in subsection 3.4.2 are discussed. The technique of three stages least square (3SLS), error correction mechanism (ECM), autoregressive distributed lag (ARDL) and dynamic ordinary least square (DOLS) are discussed in subsections 3.43, 3.44, 3.45 and 3.46, respectively. Subsections 3.4.7 deals with the diagnostic tests for the estimations, and finally the sources of data are also provided in section 3.5.

3.1 Theoretical Framework

The body of theory underlying the analysis of the effect of budgetary policy on the balance of payments is rooted in the various approaches to balance of payments. The balance of payment is linked to the other sectors of the economy in a general equilibrium sense. The combination of the monetary theory of balance of payment and the monetary theory of exchange rate determination which identifies the channels through which fiscal policy affects the accounts of balance of payment is adopted. In particular, the current study employs the monetary model on the basis of a monetary approach to the balance of payments and a monetary approach to exchange rates developed by Girton–Roper (1977). This is otherwise known in literature as Exchange Market Pressure.

The study also relies on the models developed by Aghevli-Khan (1977a, 1978) in the establishment of the fiscal deficit stimulus to inflation, determination of the way the central government adjusts its expenditure and revenue with respect to variation in inflation, and how fast such adjustment are. The framework is adopted to test its proposition on Nigerian data. The monetary models of Exchange Market Pressure and the Aghevli and Khan's models framework are explained in the following sections.

3.1.1 The monetary theory of balance of payment

The monetary approach to balance of payment has emerged since 1950s after reviving the formal view of David Hume (1754) on the theory. The work of Dornbush (1973), Hahn (1959), Mundell (1968), and Polak (1957) became the sources. Centre to this approach is the assertion that "the balance of payments is essentially a monetary phenomenon" (Frenkel & Johnson, 1977a:21). Under this approach, any excess demand for goods, services and assets or securities, resulting in a deficit of the balance of payment, reflects an excess supply of the stock of money. In analyzing the money account, the monetary approach focuses on the determinants of the excess domestic flow demand for or supply of money (Frenkel & Johnson, 1977a).

Balance of payment measures the current account balance (CAB) and the capital account balance (KAB). Goods and asset markets are reflected in the CAB and KAB, respectively. Both accounts respond to change in economic variables (such as income, interest rate, price, and exchange rate change). The demand and/or supply of money are/is affected by variation of these variables in the money market. The adjustment to equilibrium of any disturbances caused by these factors and their relation to the balance of payment are emphasized by monetary approach. At equilibrium, change in domestic money demand ΔM^D must equal change in domestic money supply ΔM^S and it is given as follows:

$$\Delta M^D = \Delta M^S \qquad 3.1$$

When economic variables (determining factors) such as income, interest rate, price, and exchange rate change, the amount of money to be held by individual (money demand) also changes. Similarly, supply of money is proportional to change in monetary base which represents changes in external reserves of Central Bank, (ΔFV) plus change in domestic credit (ΔDCR) which composes of credit to government and private sector. Thus, change in money supply is given as:

$$\Delta M^S = \Delta MB = \Delta FV + \Delta DCR \qquad 3.2$$

The money account of the balance of payment is represented by ΔFV and equation 3.2 can be restated as follows:

$$\Delta FV = \Delta M^{S} - \Delta DCR \qquad 3.3$$

The surplus or deficit in the money account with the central bank credit creation reflects the channel of change in the domestic money supply. By equation 3.1, change in money demand is equal to change in money supply and is given as:

$$\Delta FV = \Delta M^{D} - \Delta DCR \qquad 3.4$$

Current account measures the economy's overall net purchases of foreign goods, and the capital account measures its net purchases of foreign financial assets. This is because excess balance of domestic money is spent on foreign goods and/or assets which require the use of foreign exchange (Francisco and Luis, 1994). Thus, equation 3.4 becomes:

$$\Delta FV = \Delta M^{D} - \Delta DCR = CAB + KAB \qquad 3.5$$

By rearranging, equation 3.5 can further be stated as follows:

$$CAB + KAB = \Delta FV = \Delta MD - \Delta DCR \qquad 3.6$$

The left-hand side of this identity states that if a country has a deficit in both the current and the capital account, then the country has to be losing foreign reserves. The right-hand side says that a country loses reserves when domestic credit creation by central bank exceeds the flow demand for money balances. That is, if the flow of demand for money is fixed, increases in domestic credit creation are offset by decreases in reserves in the same proportion.

Equation 3.3 suggests some policy implications. Since a balance of payment deficit stands for an excess of central bank credit creation over an increase in money demanded by domestic residents, one clear means of getting rid of it as well as preventing the respective loss of foreign reserves is to lower the credit creation of the central bank by way of domestic credit ceiling. Such policy may also be used with financial programming of government activities such as forecasting money demand changes and gearing central bank credit creation to fulfil those demands. Furthermore, the monetary approach to the exchange rate determination deals with the explanation of the impact of domestic money market disequilibrium on the exchange rate where the economy is operating a fully flexible system of exchange rate (Frenkel, 1976).

3.1.2 The monetary theory of exchange rate determination

A macro theory such as the monetary approach to exchange rate determination (EX) tends to exclude some explanatory factor determining the country's money markets equilibrium and continues to analyze exchange rates which produce equilibriums at the same time among the country's money markets. The dependent variables as well as the exchange rates start to adjust till the remaining stocks of currency for each country are demanded. The exchange rate is considered a domestic price relative to foreign price (by the monetary approach) and thus direct attention on the formulation of the money demand and money supply functions. Commonly, a specific nation formulates its money supply to depend on foreign exchange reserves as well as domestic credit. For the demand for money function, variables such as income level, rates of interest, international price, the exchange rate, and the relative rate of return on international money to the rate of return on domestic money are taken into consideration (Dornbush, 1976; Frenkel, 1976; Mussa, 1975). Suppose that there are two countries, domestic and foreign. The demand for real money domestically (M^D) and the foreign demand for real money (M^{DF}) are given in equation 3.7 and 3.8, respectively.

$$M^D = L\ (V, RY, IR) \qquad 3.7$$

$$M^{DF} = L^F\ (V^F, RY^F, IR^F) \qquad 3.8$$

RY, IR and V represent the domestic real income, interest rates and other variables, respectively. The superscript F stands for foreign and L is the demand function for money balances. Similarly, the domestic supply of nominal money (M^S) and foreign supply of nominal money (M^{SF}) are given in equation 3.9 and 3.10 respectively.

$$M^S = M \qquad 3.9$$

$$M^{SF} = M^F \qquad 3.10$$

Suppose the purchasing power parity holds then it can be expressed as the equalisation of domestic price (P) to exchange rate (EX) multiplied by foreign price ($P^{F)}$ in equation 3.11.

$$P = EX\ .\ P^F \qquad 3.11$$

By making EX the subject of formula, then the expression in equation 3.11 can be represented in the form of equation 3.12.

$$EX = P\ /\ P^F \qquad 3.12$$

Domestic and foreign money market equilibrium can be formulated to imply the expression in equation 3.13 and 3.14, respectively:

$$M / P = M^{D} \tag{3.13}$$

$$M^{F} / P^{F} = M^{DF} \tag{3.14}$$

Equation 3.13 and 3.14 can be simplified to give the expression in equation 3.15 and 3.16, respectively.

$$P = M / M^{D} \tag{3.15}$$

$$P^{F} = M^{F} / M^{DF} \tag{3.16}$$

By respectively substituting P and P^F from equation 3.15 and 3.16 into equation 3.12, it gives the expression in equation 3.17.

$$EX = [M / M^{D}] / [M^{F} / M^{DF}] \tag{3.17}$$

By simplification, equation 3.17 can be expressed in the following form of equation 3.18 and 3.19.

$$EX = [M / M^{D}]\ [M^{DF} / M^{F}] \tag{3.18}$$

$$EX = [M / M^{F}]\ [M^{DF} / M^{D}] \tag{3.19}$$

Substitute M^D and M^{DF} from equation 3.7 and 3.8 respectively into equation 3.19, and gives the expression in equation 3.20.

$$EX = [M / M^{F}]\ [L^{F} (V^{F}, RY^{F}, IR^{F}) / L\ (V, RY, IR)] \tag{3.20}$$

In a simple version, money demands from equation 3.20 are assumed to be of the following multiplicative form (Francisco & Lius (1994).

$$[L^{F} (V^{F}\ RY^{F}\ IR^{F}) / L\ (V\ RY\ IR)] \tag{3.21}$$

By the assumption of the theory, income elasticity, β_1, and interest rate elasticity, β_2, of money demand are equal for domestic and foreign countries. These are expressed in Cobb-Douglas function, and the expression in 3.21 becomes the expression in 3.22.

$$[(V^F RY^{F\beta_1} IR^{F\beta_2}) / (V RY^{\beta_1} IR^{\beta_2})] \qquad 3.22$$

Therefore, equation 3.20 can be rewritten in the form of equation 3.23

$$EX = [M / M^F] [(V^F RY^{F\beta_1} IR^{F\beta_2}) / (V RY^{\beta_1} IR^{\beta_2})] \qquad 3.23$$

By simplification equation 3.23 can be expressed in the form of equation 3.24, and 3.25

$$EX = [V^F / V] [M / M^F] [RY^{F\beta_1} / RY^{\beta_1}] [IR^{F\beta_2} / IR^{\beta_2}] \qquad 3.24$$

$$EX = [V^F / V] [M / M^F] [RY^F / RY]^{\beta_1} [IR^F / IR]^{\beta_2} \qquad 3.25$$

By taking the inverses of $[RY^F / RY]$ and $[IR^F / IR]$ in the equation 3.25, the expression corresponds to equation 3.26

$$EX = [V^F / V] [M / M^F] [RY / RY^F]^{-\beta_1} [IR / IR^F]^{-\beta_2} \qquad 3.26$$

By taking the logarithm of both sides of the equation 3.26, it gives the expression in equation 3.27.

$$logEX = log [V^F / V] + log[M / M^F] - \beta_1 log[RY / RY^F] - \beta_2 [IR / IR^F] \qquad 3.27$$

Equation 3.27 is the fundamental equation for testing the monetary theory to exchange rate determination (Jimoh, 2004; Putnam & Van Belle, 1978). The equation 3.27 is rewritten as equation 3.28. If the equation 3.28 is rewritten such that all parameters carry positive signs, then traditional approach predicts that β_1 and β_2 should be greater than zero while β_3 should be less than zero.

$$logEX = log\ [V^F / V] + \beta_1 log[M / M^F] - \beta_2 log[RY / RY^F] - \beta_3[IR / IR^F] \qquad 3.28$$

The main essential points expressed by the monetary approach to exchange rate determination according to Caves and Feige (1980) is the claim that the distortion in the rate of exchange is to a greater extent explained with respect to changes in the relative money supplies of the countries. Therefore, it was suggested by the monetary approach that the supply of money can play a useful role in forecasting the rates of exchange. Observably, this further implies that exchange rates variation has causal relation with the changes in money supply.

However, Magee (1976) points out that variation in exchange rate leads to gains and losses of capital on the Central bank holdings of international reserves which are commonly in the domestic currency form. In that case, the behaviour of the Central bank could be influenced and there may result in data problems by just converting reserves into domestic currency form. Also, there is assumption that the monetary approaches, under flexible and fixed exchange regime, exclusively recognize the demand for and supply of each country's stock of money with each country's currency being held domestically. The existence of external currency markets like that of Eurocurrency market has violated the assumption. Therefore, Magee (1976) suggests that the monetary model of exchange market pressure of Girton and Roper (1977) which combines the two monetary approaches to analyze both regime of fixed and floating exchange rate is recommended as appropriate. The significances of the Girton and Roper (1977) procedure are that the coefficients of demand for money in the fixed exchange rate system may be shifted to the periods of floating exchange rate and vice versa. Given that there are no structural shifts, the fixed, floating as well as managed floating systems may be analyzed by simply employing one single equation model.

3.1.3 The monetary models of exchange market pressure

The monetary model on the basis of monetary approach to balance of payments and monetary approach to exchange rates determination was developed by Girton–Roper (1977). This is otherwise known in literature as Exchange Market Pressure defined as:

$$EMP_t = \Delta FV_t + \Delta EX_t \qquad 3.29$$

Where ΔFV is the percentage variation in international reserves (or balance of payments) and ΔEX is the percentage variation in exchange rate. The fundamental theoretical hypothesis of the Exchange Market Pressure model states that any domestic supply of money in excess of demand can be normalized by depreciation of exchange rate (domestic currency) or by losing international reserves or by the two means simultaneously in an economy with managed flexible system of exchange rate. Similarly, any domestic demand for money in excess of its supply can be corrected by the appreciation of exchange rate (domestic currency) or by gaining international reserves, or by the two means simultaneously in an economy with managed flexible system of exchange rate.

Furthermore, in a fully fixed exchange rate system, there is no variation in exchange rate and so, changes in the net international reserve serve as the medium of adjustment to equalize demand for and supply of money. This implies that any domestic supply of money in excess of its demand can be normalized by losing international reserves. Hence, the Exchange Market Pressure is absorbed by loss of reserves. In a fully floating exchange rate system on the other hand, there is no variation in international reserves and so, variations in the net exchange rates serve as a medium of adjustment to equalize demand for and supply of money. This means that any domestic supply of money in excess of demand can be normalized by depreciation of exchange rate (domestic currency). Therefore, the Exchange Market Pressure is absorbed by domestic currency depreciation. This proposition allows the monetary model of Exchange Market Pressure to be applicable to all spectrums of exchange rate regimes.

The model was originally tested on Canadian data as a two country single model to determine how much intervention necessary to realize exchange rate target after the experience of Second World War. Canada at that time being a small economy was liable to accept world fixed price and monetary conditions. From that time on, the model has been used as a single model for a small economy. The monetary model of Exchange Market Pressure is formulated from the money demand function, money supply functions and from purchasing power parity. A stable demand for money is given in form of equation 3.30 as:

$$M^D = k.DP.RY.IR \qquad 3.30$$

Where M^D is the demand for money, DP is the domestic price level (consumer price index), RY is the real income (real gross domestic product), IR is the nominal interest rate, and k is a constant, expressing the proportion of real income preferred to be held as cash balance by individual. Under the presumption of a small country, the purchasing power parity (PPP) holds and expresses the ratio of domestic price level (DP) to the world price level (WP) via the nominal exchange rate (EX). Thus, it is given as:

$$EX = DP/WP \qquad 3.31$$

From equation 3.31, make DP the subject of the formula and substitute for DP in the money demand equation 3.30 to get

$$M^{D} = k.EX.WP.RY.IR \qquad 3.32$$

The money supply function is given in equation 3.33 where M^S is the domestic money supply, FV is the international reserves, and DC is the domestic credit or domestic asset. The money multiplier is constant and taken to be unity. The equation 3.33 is a process of money supply which comprises variation in international reserves through the balance of payment and a variation in domestic credit through the banking system.

$$M^{S} = FV + DC \qquad 3.33$$

At equilibrium, change in domestic money demand ΔM^D must equal change in domestic money supply ΔM^S and it is given as follows:

$$M^{D} = M^{S} \qquad 3.34$$

Substitute M^D from equation 3.32 and M^S from equation 3.33 into equation 3.34 to get the resulting equation 3.35

$$FV + DC = k.EX.WP.RY.IR \qquad 3.35$$

The two sides of equation 3.35 are expressed in logarithm form to give equation 3.36 (Ghartey, 2005; Parlaktuna, 2005).

$$log(FV + DC) = logk + logEX + logWP + logRY + logIR \qquad 3.36$$

By differentiating equation 3.36 with respect to time t, and k is taken to be constant to gives equation 3.37

$$(\Delta FV/\Delta t)/(FV + DC) + (\Delta DC/\Delta t)/(FV + DC)= 0 +(\Delta EX/\Delta t))/(EX)+(\Delta WP/\Delta t)/(WP)$$
$$(\Delta RY/\Delta t)/(RY)+(\Delta IR/\Delta t)/(IR) \qquad 3.37$$

The expression in equation 3.37 as percentage changes can be expressed in the form of equation 3.38.

$$\Delta FV/(FV + DC) + (\Delta DC)/(FV + DC)= (\Delta EX))/(EX)+(\Delta WP)/(WP)+(\Delta RY)/(RY)$$
$$+ (\Delta IR)/(IR) \qquad 3.38$$

The specification in equation 3.38 can be simplified to give the expression in equation 3.39.

$$(FV- FV_{t-1}) /(FV + DC) + (DC- DC_{t-1})/(FV + DC)= (EX- EX_{t-1})/(EX)$$
$$+ (WP- WP_{t-1})/(WP)+(RY- RY_{t-1})/(RY) + (IR- IR_{t-1})/(IR) \qquad 3.39$$

Further simplification of the equation 3.39 for the elimination of the denominators gives the expression in equation 3.40.

$$[(FV) /(FV + DC) – (FV_{t-1})/(FV + DC)] + [(DC) /(FV + DC) – (DC_{t-1})/(FV + DC)]$$
$$= [(EX)/(EX) – (EX_{t-1})/ (EX)]+[(WP)/(WP) – (WP_{t-1})/(WP)]+ [(RY) /(RY)-(RY_{t-1})/(RY)]$$
$$+ [(IR)/(IR) - (IR_{t-1}) / (IR)] \qquad 3.40$$

In its simplier form, the expression in equation 3.40 results in equation 3.41

$$[FV - FV_{t-1}] + [DC - DC_{t-1}] = [EX - EX_{t-1}] + [WP - WP_{t-1}] + [RY - RY_{t-1}] + [IR - IR_{t-1}] \qquad 3.41$$

Equation 3.41 can as well be expressed in its percentage changes as in equation 3.42

$$\Delta lnFV + \Delta lnDC = \Delta lnEX + \Delta lnWP + \Delta lnRY + \Delta lnIR \qquad 3.42$$

In its general form, equation 3.42 can be re-specified to give equation 3.43 by adding the parameters and in which all the parameters are non-negative.

$$\Delta lnFV - \Delta lnEX = -\beta_1 \Delta lnDC + \beta_2 \Delta lnWP + \beta_3 \Delta lnRY + \beta_4 \Delta lnIR \qquad 3.43$$

In equation 3.43, FV is the percentage change in international reserves (or the balance of payments) representing the proportion of the money supply, EX is the percentage change in exchange rate (appreciation if positive), DC is the percentage change in domestic credit representing the proportion of stock of money, WP is the world rate of inflation, RY is the percentage change in real income and IR is the percentage change in nominal interest rate. Equation 3.43 is a fundamental equation of the monetary model of Exchange Market Pressure (EMP = ΔlnFV + ΔlnEX) to test the hypotheses as stated by the model that: one, DC is expected to be negative such that an increase in the domestic credit growth rate will lead to a proportional loss of international reserves and/or exchange rate increase (depreciation); two, WP is expected to be positive such that when the world price increases, it will lead to proportional increase in international reserves and/or exchange rate decrease (appreciation); RY is expected to be positive such that when the real income increases, it will cause a proportional appreciation of domestic currency and/or international reserves inflow, and finally, IR is expected to have a negative relationship.

3.1.4 The framework of Aghevli-Khan's models

Theoretical and empirical write-up has acknowledged that rapid increase in the money supply may not be unconnected with a rise in inflation (Aghevli & Khan, 1978). Therefore, the model that provides the link with which fiscal deficit response to inflation was developed by Aghevli and Khan (1977a; 1978). According to the model, the notion introduced is that inflation leads to large fiscal deficit which is financed by the central bank. As a result, money supply increases with the consequence of increasing inflation further. This is the experience in high inflation rates countries. However, Aghevli and Khan proposed that, despite the fact that the application of the model was noticeable in the countries with high rates of inflation, the model would at the same time be suitable to apply in developing countries which rate of inflation is moderate. The models consist of five major equations: price, government expenditure, government revenue, money supply, and the definitional equation which narrates how expectations are formed.

The formulation of the price (P) model is derived from the real money balances demand $(M/P)^D$ where M is the stock of nominal money balances and D stands for demand. The real money balances demand equation is specified to depend on real income (Y) and expected inflation rate (EIF) in a logarithm (ln) form as in equation 3.44.

$$ln(M/P)_t^D = \alpha_0 + \alpha_1 \ln Y_t - \alpha_2 EIF_t \qquad \alpha_1 \alpha_2 > 0 \qquad 3.44$$

Given the assumption that there are proportional adjustments of actual real stock of money balances (M/P) and prices to the excess money demand, then such adjustment can be specified as in equation 3.45 with the coefficient represented by *c*.

$$\Delta ln(M/P)_t = c\,[ln(M/P)^D{}_t - ln(M/P)_{t-1}] \qquad 1 > c > 0 \qquad 3.45$$

The formulation of expected rate of inflation (EIF) leans on adaptive expectations approach as developed by Cagan (1956). Thus, this is specified as below:

$$EIF_t = \gamma\, \Delta lnP_t + (1 - \gamma)\, EIF_{t-1} \qquad 3.46$$

In equation 3.46, γ represents the expectations' coefficient while ΔlnP_t stands for the current rate of inflation. To get the real money balances, equation 3.44 is put into equation 3.45 and the simplification gives equation 3.47, 3.48 and 3.49 as follows:

$$\Delta ln(M/P)_t = c\,[\alpha_0 + \alpha_1\, ln\, Y_t - \alpha_2\, EIF_t - ln(M/P)_{t-1}] \qquad 3.47$$

$$ln(M/P)_t - ln(M/P)_{t-1} = c\alpha_0 + c\alpha_1 ln\, Y_t - c\alpha_2\, EIF_t - cln(M/P)_{t-1} \qquad 3.48$$

$$ln(M/P)_t = c\alpha_0 + c\alpha_1 ln\, Y_t - c\alpha_2\, EIF_t + (1- c)\, ln(M/P)_{t-1} \qquad 3.49$$

From the real money balance equation 3.49, the price equation is derived to give equation 3.50

$$ln(M)_t - lnP_t = c\alpha_0 + c\alpha_1 ln\, Y_t - c\alpha_2\, EIF_t + (1- c)\, ln(M/P)_{t-1} \qquad 3.50$$

Multiplying both sides of equation 3.50 by negative sign gives the price equation 3.51

$$lnP_t = - c\alpha_0 - c\alpha_1 ln\, Y_t + c\alpha_2\, EIF_t - (1- c)\, ln(M/P)_{t-1} + ln(M)_t \qquad 3.51$$

Next is the formulation of government expenditure and revenue. The assumption here is that given any level of real income, the desired or real expenditure of government is tried to be maintained fixed by the government during the period the price level increases. At the same time, the government will react to a change in price by tending to raise or lower the real level of revenue in line with its aim of either making the whole tax system of the country to be elastic or inelastic to nominal income. The demand equation 3.52 for the government expenditure represents the forgoing assumptions.

$$ln\ (GE/P)_t^d = g_0 + g_1 lnY_t \qquad g_t > 0 \qquad 3.52$$

From equation (3.52), g is the real income elasticity of government expenditure, g > 0, GE is the nominal government expenditure, ln denotes natural logarithm, P is the price level, Y is the real income represented by real GDP and the superscript “d” indicates demand. Actual real expenditures adjust (changes in GE/P) to the gap between the desired real expenditures and actual real expenditures in the past. The representation is specified in equation 3.53

$$\Delta\ ln\ (GE/P)_t = v[\ ln\ (GE/P)_t^d - ln\ (GE/P)_{t-1}] \qquad 0 < v < 1 \qquad 3.53$$

The adjustment coefficient is denoted by “v” in equation 3.53 and the assumption behind equation 3.53 is that the real expenditure of government is maintained fixed during the rise in the level of price. To get the equation for the real expenditures, equation 3.52 is put into equation 3.53 which gives

$$ln\ (GE/P)_t - ln\ (GE/P)_{t-1} = vg_0 + vg_1\ ln\ Y_t - v\ ln\ (GE/P)_{t-1} \qquad 3.54$$

By rearranging, equation 3.54 can be expressed in the form of equation 3.55 to derive the real expenditure in the current period.

$$ln\ (GE/P)_t = vg_0 + vg_1\ ln\ Y_t + ln\ (GE/P)_{\ t-1} -\ v\ ln\ (GE/P)_{\ t-1} \qquad 3.55$$

By factorization, equation 3.55 is expressed further in the form of equation 3.56.

$$ln\ (GE/P)_t = vg_0 + vg_1\ ln\ Y_t + (1\text{-}v)\ ln\ (GE/P)_{\ t-1} \qquad 3.56$$

In equation 3.56, the average time lag taken by the real government expenditure to adjust to meet up with the increase in the level of nominal income and prices is just given as (1-v)/v. Government expenditure in equation 3.56 can be expressed in nominal form which gives the expression in equation 3.57

$$ln\ GE_{t\ -}\ ln\ P_t = vg_0 + vg_1\ ln\ Y, + (1\text{-}v)\ ln\ (GE/P)_{t-1} \qquad 3.57$$

On the other hand, in the formulation of government revenue, desired nominal government revenues (TGR_t^d) are considered to bear association with the nominal income level. Thus, the demand equation 3.58 for the government revenue represents the assumptions behind the proposition stated earlier.

$$lnTGR_t^d = t_0 + t_1\,(lnY_t + ln\ P_t) \qquad t_1 > 0 \qquad 3.58$$

From equation 3.58, TGR is the total level of nominal government revenue, and t_1 is the elasticity of revenue, Y is the real income level and P is the price level. Actual revenues adjust to the gap between the desired revenue and actual revenue realized in the last time and this is specified in equation 3.59 as

$$\Delta\ lnTGR_t = r\ (lnTGR_t^d\ -\ lnTGR_{t-1}) \qquad 0 < r < 1 \qquad 3.59$$

In the equation 3.59, the adjustment coefficient is "r". To get the equation for the nominal government revenue, equation 3.58 ($lnTGR_t^d$) is put into equation 3.59 which gives the expression in the equation 3.60

$$\Delta lnTGR_t = r\ [(t_0 + t_1(ln\ Y_t + ln\ P_t) - lnTGR_{t-1}] \qquad 3.60$$

The expression in equation 3.60 is simplified further to give equation 3.61

$$lnTGR_t - lnTGR_{t-1} = rt_0 + rt_1\ (ln\ Y_t + ln\ P_t) - r\ lnTGR_{t-1} \qquad 3.61$$

By re arranging, equation 3.61 can be expressed in the form of equation 3.62 to derive the nominal government revenue in the current period.

$$lnTGR_t = rt_0 + rt_1\ (ln\ Y_t + ln\ P_t) + lnTGR_{t-1} - r\ lnTGR_{t-1} \qquad 3.62$$

By factorization, equation 3.62 is expressed further in the form of equation 3.63.

$$lnTGR_t = rt_0 + rt_1\ (ln\ Y_t + ln\ P_t) + (1-r)\ lnTGR_{t-1} \qquad 3.63$$

According to the models, the adjustment in government spending and revenue is such that the actual level of total expenditure or revenue realized at a particular period offsets certain proportion of the difference between the desired level and the amount realized in the past period. The coefficient v and r in equations 3.57 and 3.63 represent the proportion offset for expenditure and revenue, respectively. Therefore, the fundamental equation or model of nominal government expenditure and revenue formulated by Aghevli-Khan (1978) based on its proposition are represented in the equation 3.57 and 3.63, respectively.

The basic hypothesis put forward by Aghevli-Khan (1978) is that government expenditure would adjust faster to its desired level than government revenue, with the coefficient of adjustment v, of the former greater than the coefficient of adjustment of the latter r, due to institutional factors. These factors include inadequate tax administration system, weak system of tax collection, a tax system characterized by a long elasticity of collection and long collection lag. In addition, federal government of Nigeria finds it difficult to reduce their commitments in real terms by restraining expenditures during periods of inflation. Therefore, the nominal deficit will result from the increase in the price level in as much as v > r even though $t_{1} = g_1$ (where g_1 is the real income elasticity of government expenditure, and t_1 is the elasticity of revenue).

The money supply (M) model is specified as in equation 3.64

$$M_t = m_t H_t \qquad 3.64$$

From equation 3.64, m is the money multiplier and H is the high powered money. There will be variation in the monetary base or high powered money (ΔH) when there is variation in foreign reserves (ΔFV), in the claim on the government by the central bank (ΔDCG), and in the credit to private sectors by the commercial banks (ΔDCP). These are represented in equation 3.65

$$\Delta H_t = \Delta FV_t + \Delta DCG_t + \Delta DCP_t \qquad 3.65$$

The variation in the claim on the government by the central bank (ΔDCG) is taken to represent government fiscal deficit (which is the difference between government expenditure, GE and government revenue, TGR). Also, the variation in foreign reserves

(ΔFV) and the variation in the credit to private sectors by the commercial banks (ΔDCP) are taken to be represented by E. Given this representations, equation 3.65 can be expressed in the form of equation 3.66.

$$\Delta H_t = GE_t - GR_t + E_t \qquad 3.66$$

The formulation assumes that when there is increase in government deficit, there will be proportional change in the high powered money since the deficit is financed through the central bank loans or through the use of cash balance left with the central bank or through the loans from foreign countries or loans from commercial banks. Therefore, the money supply model is given as:

$$M_t = m_t (GE_t - GR_t + E_t) \qquad 3.67$$

Equation 3.67 is approximated to make it linear in logarithm form to give equation 3.68

$$lnM_t = ln\ m_t + \alpha_0 + \alpha_1\ lnGE_t - \alpha_2\ lnGR_t + \alpha_3\ lnE_t) \qquad 3.68$$

In summary, the Aghevli-Khan (1978) complete model consists of five equations and they are restated as follows:

$$EIF_t = \gamma\ \Delta lnP_t + (1 - \gamma)\ EIF_{t-1} \qquad 3.46$$

$$lnP_t = - c\alpha_0 - c\alpha_1 ln\ Y_t + c\alpha_2\ EIF_t - (1- c)\ ln(M/P)_{t-1} + ln(M)_t. \qquad 3.51$$

$$ln\ GE_t = vg_0 + vg_1\ ln\ Y, + (1-v)\ ln\ (GE/P)_{t-1+}\ ln\ P_t \qquad 3.57$$

$$lnTGR_t = rt_0 + rt_1\ (ln\ Y_t + ln\ P_t) + (1-r)\ lnTGR_{t-1} \qquad 3.63$$

$$lnM_t = ln\ m_t + \alpha_0 + \alpha_1\ lnGE_t - \alpha_2\ lnGR_t + \alpha_3\ lnE_t) \qquad 3.68$$

3.2 Analytical Models for the Study

In order to have a clear understanding of the role of fiscal policy in the external problems of Nigeria, there is a need to develop a model that captures the structure of the economy. Therefore, drawing on the insights of the theoretical framework, dynamic macroeconomic models of the Nigerian economy that consider the interactions between fiscal policy, monetary policy, inflation, the balance of payments and domestic debt, among others are built. The models contain government revenue and expenditure; real money supply; a multivariate form of vector error correction model for Granger causality test; and the monetary model of exchange market pressure. The variables are selected based on theory and data availability.

3.2.1 Government sector: expenditure and revenue

In order to address the research question 2: "How do the authorities of Nigerian government adjust the desired level of alternative forms of nominal spending and income from taxes to a variation in the level of price, and how fast are such adjustments as shown in the actual spending adjustment decision?", this study applies the Aghevli-Khan (1978) models as expressed under the theoretical framework.

The fundamental models (the expenditure model, revenue model, and the definitional equation that describe how the expectations are formed) provide the linkages of response of government deficit to inflation. These models are adopted and applied to Nigeria as one of the inflationary developing countries. According to the models, the adjustment in government spending and revenue is such that the actual level of total expenditure or revenue realized at a particular period offsets certain proportion of the difference between the desired level and the amount realized in the past period. The coefficient "v" and "r" in equations 3.57 and 3.63 respectively represent the proportion offset for the expenditure and revenue. The basic hypothesis put forward by the models is that government expenditure would adjust faster to its desired level than government revenue. In this case, the coefficient of adjustment "v", of the former will be greater than the coefficient of adjustment of the latter "r", due to institutional factors during the period of rising inflation. Therefore, the nominal deficit will result from the increase in the price level in as much as $v > r$ even though $t_1 = g_1$ (where g_1 is the real income elasticity of government expenditure, and t_1 is the elasticity of revenue).

Heller (1980) argues that one would expect the rate of fiscal adjustments (v and r) to be influenced greatly by the level of inflation, rate of inflation as well as by the previous history of inflation in the country. The type of procedures to be followed by the fiscal management authority when a country experiences a common high inflation rate are likely to differ from those adopted when mild inflation is generally experienced. For example, if the inflation is high and chronic, operating authorities are likely to be more sensitive to its impact on the cost of their programmes. Thus, budget decision makers will be pressurised considerably to address the impacts of inflation on government programmes in the budget formulation and budget disbursement processes. In a mild inflationary period, finance authorities could intentionally avoid suggesting inflation guidelines during the time of initial budget estimates presentation. In effect, government, both in its role as a tax collector and as a producer of essential services eventually becomes familiar to the impacts of a given degree of inflation on its fiscal undertakings.

One can notice wide variations in the level of exogeneity of price increases to the government (Heller, 1980). For some forms of expenditure, exogeneity of price increases occur to the public sector, but in other sectors, government may attempt to limit such inflationary pressures by controlling commodities or factor prices. The combined effects of those exogenous pressure and the pricing decisions of government determine the increase in the cost of output to the government and indirectly, the degree of any relative price effect. Therefore, government decision makers are always aware of the consequences of not making adjustment quickly for specific categories of expenditure, although this judgement may not meet with the reality of the effect in most cases.

With respect to the exogeneity of price changes to the decision makers, different types of pressure to government for immediate adjustment may arise from wages and salaries; other current purchase of goods and services; servicing of financial obligations (interest and debt services); capital expenditure (acquisition of fixed capital assets, purchase of land, inventories etc); net lending; transfers and subsidies (capital and current) to individuals, enterprises, and other level of government.

Whether the speed of adjustment to inflation is determined by whether the inflation rate has been anticipated is an important issue. By following Heller (1980), it is assumed that budget formulation by the Nigerian government authorities take into consideration of the price expectations while planning and designing the budget and revenues for the future. Therefore, if these price anticipations are accurate, the actual expenditure and revenue change ought to approximate intended change in the budget. Consequently a reasonable rapid fiscal adjustment to anticipated inflation should be observed. If there is a remarkable difference between the rate of inflation and the expected inflation, it may not be expected that this reflects rapidly in actual revenue flow or expenditure decisions.

Given the forgoing arguments, Heller suggests that the desired expenditure under the expected price level, EIF_t given as $GE^D(EIF_t)$,will in no doubt differ from the desired expenditure when it is obvious that the actual price level that will be realized, $P^A{}_t$ differs from EIF_t. This implies that $GE^D(P_t^A) > GE^D(EIF_t)$ if $P^A{}_t > EIF_t$ .The variation in actual nominal expenditures between the present period t and the past period t-1 is presumed to reflect: (i) adjustment of v_1 percent of the difference between $GE^D(EIF_t)$ and $(GE/P)_{t-1.}$ This reflects the response to expected inflation; (ii) an adjustment of v_2 percent of the difference between $GE^D(P_t^A)$ and $GE^D(EIF_t)$. This reflects the response to unexpected inflation at that period. The same analysis applies to desired government revenue in response to expected and unexpected inflation. Representations of these analyses are given in equation 3.69 and 3.70.

$$\Delta ln(GE/P)_t = v_1[(lnGE^D(EIF_t) - (GE/P)_{t-1})] + v_2[(GE^D(P_t^A) - GE^D(EIF_t)] \qquad 3.69$$

$$\Delta lnTGR_t = r_1[(lnTGR^D(EIF_t) - TGR_{t-1})] + r_2[(TGR^D(P_t^A) - TGR^D(EIF_t)] \qquad 3.70$$

By simplification, equation 3.69 and 3.70 yield the following set of equation 3.71 and 3.72, respectively.

$$ln(GE/P)_t - ln(GE/P)_{t-1} = v_1 ln(GE/P)_{t-1} + v_1 lnGE^D + v_1 lnEIF_t + v_2 ln(P_t^A/EIF_t) \qquad 3.71$$

$$lnTGR_t - lnTGR_{t-1} = r_1 lnTGR_{t-1} + r_1 lnTGR^D + r_1 lnEIF_t + r_2 ln(P_t^A/EIF_t) \qquad 3.72$$

By substituting original demand equation 3.52 for government expenditure ($lnGE^D$) and original demand equation 3.58 for government revenue ($lnTGR^D$) in equation 3.71 and 3.72 respectively, we have the following equations:

$$ln(GE/P)_t = (1- v_1)ln(GE/P)_{t-1} + v_1 (g_0 + g_1 +lnY_t) + v_1lnEIF_t + v_2ln(P_t^A/EIF_t) \qquad 3.73$$

$$lnTGR_t = (1- r_1)lnTGR_{t-1} + r_1[(t0 +t1(lnY + lnP)] + r_1lnEIF_t + r_2ln(P_t^A/EIF_t) \qquad 3.74$$

Equation 3.73 can be rearranged and expressed in nominal form to give equation 3.75 while equation 3.74 is similarly rearranged in the following form of equation 3.76.

$$ln\ GE_t = vg_0 + vg_1\ ln\ Y, + vg_2EIF_t + vg_3ln(P/EIF)_t + (1-v)ln(GE/P)_{t-1}+ ln\ P_t \qquad 3.75$$

$$lnTGR_t = rt_0 + rt_1\ (ln\ Y_t + ln\ P_t) + vt_2EIF_t + rt_3ln(P/EIF)_t + (1-r)\ lnTGR_{t-1} \qquad 3.76$$

By following Heller (1980), it is assumed that budget formulation by the Nigerian government authorities take into consideration of the price expectations while planning and designing the budget and revenues for the future. For this reason, the Aghevli-Khan (1978) models are augmented by adding expected inflation (EIF), and the ratio of actual price to the expected inflation (P/EIF) to both government expenditure equation 3.57 and government revenue equation 3.63. These augmentations capture the role of expectation in budget formulation by the Nigerian budget decision making body.

The specification of the models in logarithm makes it easy and simple to read the elasticities (Zarembka, 1968). The semi-logarithm of the model 3.75 and 3.76 with regards to the expected inflation follows the work of Cagan (1968) and Aghevli-Khan (1978). Expected inflation is not logged because it is in a percentage form. In addition, it has been pointed out that neither semi-logarithm nor double logarithm has clear preference over another (Frenkel & Johnson, 1977). Therefore, the sem-ilogarithm of these models is deemed appropriate.

The formulation of expected rate of inflation leans on adaptive expectations approach as developed by Cagan (1956) and adopted by Aghevli-Khan (1978) and Kilindo (1997). This is specified as follows:

$$EIF_t = \gamma \Delta lnP_t + (1 - \gamma) EIF_{t-1} \qquad 3.46$$

In equation 3.46, γ represents the expectations' coefficient while $\Delta \ln P_t$ stands for the current rate of inflation. Heller (1980) assumes both the price level and expected rate of inflation to be independent of the equation of fiscal behaviour based on the notion that a recursive model in which prices at a particular period are affected only by fiscal variables of the past periods is more reasonable. Thus, the expected rate of inflation is re-specified as:

$$P/EIF_t = \beta \Delta lnP_t + (1 - \beta) EIF_{t-1} \qquad 3.77$$

The fundamental hypothesis is that when the government spending increases at the same time with inflation, government revenue will lag behind as a result of lag in the process of collection. The average time lags simply given as (1-v)/v and (1-r)/r for the government expenditure and government revenue respectively will be computed from the results of equation 3.75 and 3.76 accordingly. The two equations are estimated to determine how the Nigerian government authorities adjust the desired level of its alternative forms of nominal spending and income from taxes to a variation in the level of inflation, and how fast are such adjustments as shown in the actual spending adjustment decision.

From the expenditure equation 3.75, if any of the variables [real income (Y), expected inflation (EIF), price expectation, given as ratio of actual price to expected inflation (P/EIF), and the one period lag of real government expenditure (GE/P)] is positively significant, it implies that an increase in such variables will cause the government to increasingly adjust its level of expenditure. Opposite is the case if any of the variables is negatively significant. Similarly, from the revenue equation 3.76, if any of the variables [real income (Y), expected inflation (EIF), price expectation, given as ratio of actual price to expected inflation (P/EIF), and one period lag of the total government revenue (TGR)] is positively significant, it implies that an increase in such variables will cause the government to increasingly adjust its level of revenue, and it is vice versa if any of the variable is negatively significant. The value of the coefficient of adjustment, "v" as compared to "r" determines how fast such adjustments are.

3.2.2 Fiscal deficits, credit creation and money supply

This section provides the estimating models to address the research question 3: What roles do the fiscal deficits, and domestic credits to private sectors play in influencing the growth of money supply in Nigerian economy? Budget deficits which are the excess of government spending over its revenues are often financed by central bank credit creation in Nigeria. Accordingly, government fiscal and monetary policies are often interconnected, with deficits linked to corresponding increases in the money supply. The growth of various economic variables (such as interest rate and central bank credit) gives rise to changes in money demand and/or changes in the money supply.

Korsu (2009) specified the fundamental changes in money supply equation based on the credit counterpart approach to money supply determination as a function of fiscal deficit, net external transactions of the government, domestic debt management policy of the government, and change in bank lending to the private sector. In Nigeria, the link between the fiscal deficits and money supply can be traced to the monetary base of the central bank. The change in monetary base or high power money which gives rise to more money supply occurs as a result of the use of bank credit to finance government deficits. Credit to private sectors from domestic banking and from external sources is also an important determinant of money supply. Therefore, changes in money supply are related to changes in government fiscal deficit, and changes in domestic credit to private.

Given the above relationship and by following Korsu (2009) the semi-logarithm formulation of real money supply (MS) equation (which is nominal broad money deflated by consumer price index) for Nigeria economy is stated as a function of government fiscal deficit (GFD), domestic credit to private sectors (DCP), the opportunity cost of holding money, interest rate (IR) and the general price level (P) in equation 3.78.

$$lnMS_t = \alpha_0 + \alpha_1 GFD_t + \alpha_2 lnDCP_t + \alpha_3 lnIR_t + \alpha_4 lnP_t + U_t \qquad 3.78$$

All the variables are in logarithm form (ln) except the government fiscal deficit. From equation 3.78, the expectation is that when there is rise in government fiscal deficit probably due to a rise in inflation, the supply of money is expected to rise as well. In the same vein, when the domestic credit to private sector rises, the supply of money is also expected to increase. The price level represented by consumer price index is expected to be positively related with the real money supply. The theory of economics has provided two opposing perspectives with regards to the relation of money supply with the interest rate. These are liquidity effect perspective of Keynes and the Fisher equation perspective.

The former emphasizes that money supply has negative association with the interest rate following the interaction of money supply with the money demand. This results from the fact that for interest rate to increase there is need for money supply to fall. Demand for money also increases as the interest rate falls since interest rate is the cost of holding idle balances. For the sustenance of equilibrium level of money market, money supply has to fall so as to make interest rates rise to make demand for money equals its supply. This perspective takes into consideration expectations such that sudden variation in money is not anticipated to change growth of money in the future and thus causes the movement of interest rates in negative direction with the money supply (Monnet & Weber, 2001)

The Fisher equation perspective, on the other hand, argues that money supply and interest rate have positive relationship. This results from the fact that for interest rate to increase there is need for money growth rate to increase. From this equation, the nominal rate of interest is equalized to the summation of the real interest rate and the expected inflation rate (Fisher, 1896). Given the condition that monetary policy never influenced the real interest rate, it follows from Fisher equation that an increase in nominal rates of interest is related to an increase in inflation rate. Due to the fact that an increase rates of inflation bear relationship with increase rates of growth in money in the long run, it follows that for interest rates to rise there is a need for the growth rate of money to increase from the Fisher equation. The Fisher equation perspective expects the sudden change in money to cause changes in the growth of money in the future and thus makes interest rates to move positively with the money supply (Monnet & Weber, 2001).

3.2.3 Granger causality test between the pairs of variables

This section addresses the research question 4: What are the long and short run directions of causality among the price level, real money supply, government fiscal deficit, interest rate and real output? In order to achieve the objective, both co-integration and Granger causality tests are conducted based on autoregressive distributed lag (ARDL) approach. Having established the presence of co-integration among the price level, real money supply, government fiscal deficit, real income, interest rate and real output, then there must be a minimum of one-directional causality between the variables, which direction however, is not indicated from the co-integration results. The determination of such direction is implemented by Granger causality tests involving the estimation of a multivariate form of vector error correction model (as stated in equation 3.79) within the context of ARDL framework. Each variable (price level, real money supply, government fiscal deficit, real income and interest rate) takes turn to serve as dependent variable in equation 3.79 and the one period lagged error correction term (ECM_{t-1}) obtained from the long run co-integration relationship is only added to the equations of dependent variable which is/are co-integrated. On the other hand, (ECM_{t-1}) is excluded in equation 3.79 for dependent variable(s) which is/are not co-integrated.

$$\Delta lnP_t = \gamma_0 + \sum_{i=1}^{k} \gamma_1 \Delta lnP_{t-i} + \sum_{i=1}^{k} \gamma_2 \Delta lnMS_{t-i} + \sum_{i=1}^{k} \gamma_3 \Delta GFD_{t-i} + \sum_{i=1}^{k} \gamma_4 \Delta lnIR_{t-i} + \sum_{i=1}^{k} \gamma_5 \Delta lnRY_{t-i} + \alpha_1 ECT_{t-1} + U_{1t} \qquad 3.79$$

From equation 3.79, Δ is the first difference operator, ln is the natural logarithm, K is the optimum lag, P is the price level, MS is the real money supply, GFD is the government fiscal deficit, IR is the interest rate and RY is the real gross domestic product (real output) and U is the error term. All the variables are in natural logarithm form with the exception of government fiscal deficit. The government fiscal deficit is not in natural logarithm because almost all its values are in negative form. The results of Granger causality show the long run and short run causality in the context of the error correction mechanism. Chi-square statistics associated with the lagged regressors (independent variables) of the ECM determine the significance of the causal impacts in the short run while the t-statistics associated with the lagged ECT determine the significance of the causal impacts in the long run.

3.2.4 The monetary model of exchange market pressure

This section provides the estimating models to address the research question 5: "By what means does the Central Bank of Nigeria (monetary authorities) absorb the exchange market pressure or external imbalances for Nigeria?"

In economies without a well developed capital market such as Nigeria, the government budget is primarily financed by borrowing from the banking system or abroad. A fiscal deficit generated through increase public expenditure in relation to lag in revenue collection, which is part of aggregate demand, affects demand for imports. Financing the deficit through domestic credit creation increases the supply of money with the consequence of increasing domestic inflation. This, at the beginning partially offsets the expansionary thrust and its indirect effect on the demand for imports and ultimately the current account balance.

The excess supply of real money balances directly stimulates private sector income and, therefore, the demand for goods and services through the multiplier process. The increase in both public and private expenditures for domestic output, which is usually in short supply, often pushes up domestic prices. This tends to increase import demand and reduce the demand for exports, thereby leading to a balance of payment deficit. Financing the external deficit may involve lower external reserves or higher domestic and/or external debt. The balance of payment problem is therefore a monetary phenomenon. In this sense, any excess demand for goods, services and assets or securities, resulting in a deficit of the balance of payment, reflects an excess supply over demand of the stock of money.

The adjustment to equilibrium of any disturbances caused by the determinants of demand and/ or supply of money are emphasized by the monetary model of Exchange Market Pressure based on the monetary approach to balance of payments and a monetary approach to exchange rates determination. The monetary model of Exchange Market

Pressure is formulated from the money demand function, money supply functions and from purchasing power parity (Connolly & da Silveria, 1979; Ghartey 2002, 2005; Kim, 1985; Mah, 1991, 1995; Modeste, 1981; Parlaktuna, 2005; Thornton, 1995). The classical type of money demand function is given in equation 3.80 as:

$$M^D = k.DP.RY \qquad 3.80$$

Where M^D is the money demand, DP is the domestic price level (consumer price index), RY is the real income (real gross domestic product), and k is a constant, expressing the proportion of real income preferred to be held as cash balance by individual or Cambridge constant. In the studies for Canada, nominal interest rate was included in the money demand function by Girton and Roper (1977) and Weymark (1995, 1997). Such inclusion has been argued to lead to problem of simultaneous equation bias in the Exchange Market Pressure model particularly if the monetary decision making body decides to vary domestic credit to pay for changes in international reserve or net foreign assets (Connolly & da Silveira, 1979; Ghartey, 2002, 2005; Modeste, 1981; Thornton, 1995). Therefore, nominal interest rate is held constant and not included in the money demand equation.

Under the presumption of a small country, the purchasing power parity (PPP) holds and expresses the ratio of domestic price level (DP) to the world price level (WP) via the nominal exchange rate (EX). The expression is given in equation 3.31.

$$EX = DP/WP \qquad 3.31$$

From equation 3.31, make DP the subject of formula and substitute for DP in the money demand function 3.80 to get

$$M^D = k\,.EX\,.WP.RY \qquad 3.81$$

The money supply function following Mundell (1971) is given in equation 3.33 where M^S is the domestic money supply, FV is the international asset, and DC is the domestic credit or domestic asset. The money multiplier is constant and taken to be unity. The equation 3.33 is a process of money supply which comprises variation in international reserves through the balance of payment and a variation in domestic credit through the banking system.

$$M^S = FV + DC \qquad 3.33$$

At equilibrium, change in domestic money demand ΔM^D must equal change in domestic money supply ΔM^S as given in equation 3.34.

$$M^D = M^S \qquad 3.34$$

By substituting equations 3.81 and 3.33 into equation 3.34, taking logarithm, differentiating the expression and expressing the outcome in the form of percentage changes gives equation 3.82.

$$\Delta lnFV - \Delta lnEX = -\beta_1 \Delta lnDC + \beta_2 \Delta lnWP + \beta_3 \Delta lnRY \qquad 3.82$$

Equation 3.82 is a fundamental equation of EMP to test the hypotheses that: one, domestic credit (DC) is expected to be negative such that an increase in the domestic credit growth rate will lead to a proportional loss of international reserves (FV) and/or increase in exchange rate (EX) (depreciation); two, world price (WP) is expected to be positive such that when the world price increases, it will lead to proportional gain of international reserves and/or exchange rate decrease (appreciation); and finally, real income (RY) is expected to be positive such that when the real income increases, it will cause a proportional appreciation of domestic currency and/or international reserves inflow. In addition, Fleming (1962), Mundell (1962) and Obstfeld (2001) have argued that where there is perfect capital mobility, any rise in the real income has the tendency of causing demand for money to rise. As a result, interest rate will increase thereby leading to an inflow of foreign assets and appreciation of domestic currency.

In order to test how sensitive is the measure of EMP to changes in exchange rate and foreign reserve, and to verify the means by which the pressure is absorbed by change in each of these constituent variables of EMP, Girton and Roper (1977) added the ratio of exchange rate to foreign reserve (EX/FV) to EMP equation. However, Connolly and da Silveira (1979) observe that this is appropriate where there is no discontinuity in (EX/FV) such that there is no frequent change of surplus to deficit and deficit to surplus during the study period. They point out that where there is discontinuity, S = (EX-1)/(FV-1) is the appropriate variable to use. Since there is discontinuity in the case of Nigeria, the researcher follows Connolly and da Silveira (1979), Ghartey (2005), and Parlaktuna (2005). By adding variable S to the EMP equation 3.93, the resulting expression is given in equation 3.83.

$$\Delta lnFV - \Delta lnEX = - \beta_1 \Delta lnDC + \beta_2 \Delta lnWP + \beta_3 \Delta lnRY + \beta_4 S \qquad 3.83$$

From the results obtained from equation 3.83, one can conclude that there is no discrimination in the absorption of exchange pressure if the parameter estimate of variable S is not significant and the estimated results of other exogenous variables (DC, WP and RY) are left unaltered as in EMP equation 3.82. This implies that EMP is insensitive to its constituent variables. Hence, the amount of intervention needed to realize a targeted exchange rate can be determined by the monetary authorities by using the international reserve and exchange rate depreciation simultaneously (Connolly & da Silveira, 1979; Ghartey, 2005; Girton & Roper, 1977; Parlaktuna, 2005; Stavarek, 2010). Suppose the parameter estimate of variable S is positively significant while the results of DC, WP and RY remain the same with EMP result, it means that exchange pressure is absorbed by forfeiting international reserve only. On the other hand, if the parameter estimate of variable S is negatively significant while the results of DC, WP and RY remain the same with EMP result, then domestic currency depreciation is used to absorb the exchange pressure, cetiris paribus (Ghartey, 2005; Parlaktuna, 2005; Stavarek, 2010).

In order to test the efficiency of EMP and verify the true endogenous variable, the composition of EMP is split into foreign reserves and exchange rate, and each of them separately serves as a dependent variable to the explanatory variables of the EMP equation. The international reserve (or balance payments) and exchange rate equation using the EMP exogenous variables are specified in equation 3.84 and 3.85, respectively.

$$\Delta lnFV = -\beta_1 \Delta lnDC + \beta_2 \Delta lnWP + \beta_3 \Delta lnRY \qquad 3.84$$

$$\Delta lnEX = -\beta_1 \Delta lnDC + \beta_2 \Delta lnWP + \beta_3 \Delta lnRY \qquad 3.85$$

Each of the equation is estimated and the endogenous variable between the two, which results give the best estimates is taken to have borne the brunt of absorbing the external imbalances or exchange market pressure. The results obtained are to confirm those obtained in EMP equation 3.82 for the efficiency sake.

From the forgoing, the four equations to be estimated under the monetary model of Exchange Market Pressure are equation 3.82, 3.83, 3.84 and 3.85.

3.3 The Model Interrelationships

It is important at this point to explain how the model works. Suppose that at the beginning, money supply rises through change in foreign reserves, change in central bank claims on private sectors, stock of monetary base in the past period, and central bank credit to government from money supply equation 3.78. This will bring about a rise in the level of price or inflation and consequently makes government spending in equation 3.75 and revenue in equation 3.76 to rise. Assuming that the rise in spending by government is more than its revenue, this increases the fiscal deficit and will cause the money supply to further increase. A further increase in money supply furthers the cause of increase in price level again and the process tends to repeat itself. In Nigeria, the major means of financing fiscal deficit is through bank credit. Suppose the banking system increases the credit supply to the government, the amount of total stock of money will rise and the channel is through money supply equations 3.78. The impacts on the dependent variables are reflected in the sign, magnitude, and significance of the coefficients obtained from the estimation of the model. The coefficients of the endogenous variables determine the direction of the changes.

As a feedback effect, some endogenous variables influence other endogenous variables. For example an increase in money supply affects price level. This in turn increases the general price level making import to be relatively cheaper as the price of import now fall or remain constant while its effect also reduces non-oil exports. The pressure on foreign exchange resulting from increased domestic price, depreciates the domestic currency. The resulting foreign trade balance increases the domestic credit position. This makes the external reserve (or overall balance of payment) and exchange rate to be affected via EMP equation 3.82. Furthermore, EMP equation 3.82 shows how change in import is reflected in change in external reserves and exchange rate. Since money base has domestic and foreign components, the external assets of the central bank decreases as well via EMP equation 3.82. This offsets the initial increase in the central bank's credit to the government. The chain of causation is now traced in full circle. Therefore, an increase in the net domestic credit to the government simultaneously affects the government sector, monetary stability, and external sectors.

From the inter-linkages among relationships in the model, two main lines of impact can be identified. First is the direct impact of fiscal policy on the balance of payments. A fiscal policy generated through excessive public expenditure affects imports through its effects on aggregate demand. The increase in both public and private expenditure for domestic output, which is usually in short supply, often pushes up domestic prices relative to foreign prices. This tends to increase import demand and reduce demand for exports, thereby leading to current account deficit. Second, is the indirect effect on the demand for imports, and ultimately on the balance of payments. Financing the deficit mainly through domestic credit creation increases domestic price level relative to import prices and the pressure on the exchange market can be resolved by domestic currency depreciation and/or loss of external reserves.

3.4 Methods of Estimation, and Test Statistics

Under this section, the statistical properties of the variables are examined. This involves the stationarities test conducted in order to examine the presence of unit root for the variables. Also conducted is the test for co-integration to verify the existence of long run association among the series. Four methods of estimation were pursued in this current study namely, three-stages least squares (3SLS), Johansen co-integration, error correction mechanism (ECM), auto-regressive distributed lag (ARDL) and dynamic ordinary least squares (DOLS). These are briefly explained in the following sections.

3.4.1 Unit root and stationarity tests

Recent development in the econometric of time series stresses the important of testing for unit roots in the series since classical regression properties only hold for cases where variables are stationary at level (integrated of order 0). Brooks (2008) defines a stationary series as one having its mean, variance and autocovariances constant for each given lag. However, most economic variables do not satisfy these assumptions and have their mean, variance or both varying with time. They are in any case integrated of order 1 (or higher) after differencing. Two forms of non stationarity can be described by two models which have been commonly employed to indicate the non stationarity. One is the random walk model with drift (if the mean and variance increase over time) and without drift (if the value of dependent variable (Y) at time t is not different from its value at time (t-1) plus a random shock. Two is the trend stationarity process (if the mean of dependent variable (Y) is not constant but the variance is constant) (Gugarati & Porter, 2009). Therefore, it is important to examine whether a series is stationary or not because of the reasons given below:

First, the properties and behaviour of a series can highly be influenced by the stationarity or non stationarity of a series in which case, ‘shocks’ to the system will wipe away gradually from one period to another in the case of a stationary series as compared with non stationary series where the shocks will be continuous indefinitely (Brooks, 2008).

Second, Granger and Newbold (1974) and Phillips (1986) argue that such combination of variables that are non-stationary leads to spurious regression results. In this case, if the application of a standard method of regression is carried out on non stationary data, the results will appear good with respect to the significance of parameter estimates and a high R-square, where in actual fact it is valueless. Sometimes, there is problem of autocorrelation due to the non-stationarity of the time series data. Such a regression model is called a spurious regression.

Third, the standard assumption for asymptotic analysis will be invalid in a case where the variables used in a regression model are non stationary. This implies that the t-ratios and F-statistic for example, will not follow a t-distribution and the F-distribution, respectively. This indicates that it will be impossible to validly conduct hypothesis testing of the estimated coefficient in a case where the data are not stationary.

Therefore, stationary test needs to be conducted to avoid spurious regressions and one important of such tests is the Augmented Dicky-Fuller (1981) unit root test which is known as (ADF). In Dicky Fuller test, if a time series is defined by the first-order autoregressive process given as:

$$y_t = \alpha + \rho y_{t-1} + \varepsilon_t \qquad 3.86$$

Where, the errors are identically and independently distributed with a mean of zero and a constant variance. By subtracting (y_{t-1}) from both sides of equation (3.86) we have expression:

$$\Delta y_t = \alpha + \varphi y_{t-1} + \varepsilon_t \qquad 3.87$$

Where $\varphi = \rho$-1 and the pair of hypothesis are specified below as:

H_O: $\varphi = 0$ (ρ =1, implies that y_t series is integrated of order 1 or non-stationary)

H_1: $\varphi < 0$ (ρ <1, implies that y_t series is integrated of order 0 or stationary

In order to capture any deterministic trends in the data, the expression (3.87) is modified, with t as time trend and expressed as:

$$\Delta y_t = \alpha + \varphi y_{t-1} + \beta T + \varepsilon_t \qquad 3.88$$

For the computation of Augmented Dicky Fuller, the following equation is used:

$$\Delta y_t = \alpha + \varphi y_{t-1} + \beta T + \sum_{j=1}^{k} \delta_j \Delta y_{t-j} + \varepsilon_t \qquad 3.89$$

The estimate of φ is tested whether it is equal to Zero. If the test statistic calculated is greater than the critical value, the null hypothesis that a variable has unit root is rejected. Alternatively, the null hypothesis of non stationarity of a series is rejected if the p value is less than 5%. In order to correct for the presence of unit root, any data series found to be non-stationary are transformed through differencing to achieve stationary series.

3.4.2 Testing and estimating parameter in co-integrated systems

The co-integration test is important to determine the existence of any long run relationship among the series in the model. One method of parameter estimation in co-integrated system is Engle-Granger two-step procedure. The Engle and Granger two-step procedure could be described as follows: Firstly, the order of integration is determined using Dicky-Fuller (DF) and Augmented Dicky-Fuller (ADF) tests. Secondly, the econometric relationship between the levels variables is estimated using OLS. The equation 3.90 is thus estimated:

$$y_{t-1} = \alpha + \beta x_{t-1} + \varepsilon_t \qquad 3.90$$

The result obtained from the estimation of equation 3.90 is given in the equation 3.91 as:

$$y_{t-1} = \hat{\alpha} + \hat{\beta} x_{t-1} + \hat{\varepsilon}_t \qquad 3.91$$

The long run relationship between the level variable y_t and x_t is represented by the co-integration regression equation (3.91). As Engle and Granger (1987) point out, such regressions would yield consistent estimates. Next is to establish whether the estimated residuals are stationary using Dicky-Fuller/ Augmented Dicky Fuller tests. Given that the residuals from the co-integration regression arere stationary at level, this suggests that y_t and x_t are co-integrated of order zero or I(0). Thirdly, is to formulate and estimate the error correction model (ECM) of the equations which incorporate the full (short run) dynamics of the models. The (ECM) is given as:

$$\Delta y_t = \alpha + \beta \Delta x_t - \varphi ECM_{t-1} \qquad 3.92$$

The estimated residual in equation (3.91) is represented by ECM in equation (3.92) and all the variables are integrated of the same order [assume to be I(0)] in equation (3.92). The Engle and Granger two-step procedure discussed above has the following stated weaknesses (Brooks, 2008):

First, the maximum co-integrating relationship that can be estimated is only one irrespective of the number of variables in a system. In a situation where there are many variables, there is likelihood of having more than one linearly independent co-integrating relationship. Also, where there are multiple co-integrating relationships it becomes difficult to either know the presence of others or determine the strength of co-integrating relationships. This problem is associated with small samples.

Second, simultaneous equation bias could occur due to small sample problem. For example, if the causality from two variables such as y and x are bidirectional, but this method of single equation demands that one variable be specified as exogenous variable and the other as endogenous variable, then the two variables are compelled to be treated unequally without theoretical reason backing it. Assuming that an equation with y as dependent variable and x as independent variable have been estimated as a possible co-integrating regression instead of the other way round, then this means that if the error term in the estimated y equation is integrated of order 0, the error term in the x equation is also integrated of order 0. This may not be true practically. In addition, any error in the specified model in the first stage will be shifted to the co-integration test at the second stage due to the way the co-integration test statistic is designed to be computed.

Third, in Engle and Granger two-step procedure there is no room to conduct any tests of hypothesis with respect to the actual co-integrating relationship estimated at first stage. In view of the problems associated with Engle and Granger approach it is appropriate to investigate the co-integration issue using the VAR framework of Johansen. Therefore, this study employs the Johansen (1991, 1995) system approach to co-integration which makes it possible to determine all r co-integrating relationships. The method provides a number of co-integrating equations and estimates of all co-integrating vectors in the multivariate case. The Johansen approach shows the process of adjustment of the system from short run dynamics to long run equilibrium.

Two test statistics can be used for co-integration under the Johansen method and the critical values for the two statistics are provided by Johansen and Juselius (1990). If the trace statistics is above the critical value from Johansen's tables, the null hypothesis which states that there are r co-integration vectors is rejected and the alternative hypothesis which state that there are r+1 or more than r is accepted. Similarly, the null hypothesis is rejected if the p value is less than 5%. For the second test statistics, if the Max-Eigen value is more than the critical value then the null hypothesis is rejected. Similarly, if the p value is less than 5%, the null hypothesis is rejected in favour of the alternative hypothesis.

3.4.3 Technique of three stages least squares

The method of simultaneous technique employed involves the three-stage least squares (3SLS) to estimate the public sector (government expenditure and revenue) models in order to establish the fiscal deficit as linked to inflationary or price level. The use of three-stage least squares (3SLS) is considered desirable as it gives room for someone to put into account all a-priori restriction intrinsic in the specification (Aghevli-Khan, 1978). The method makes necessary correction for the possible cross-equation autocorrelation. In addition, the three-stage least squares (3SLS) carry out the estimation of the whole equations at once as a system instead of estimating them one after the other (Korsu, 2009). In the process of estimation, three stages least squares give the step three which permits non-zero covariances between the disturbance terms in the structural equations. It is more efficient asymptotically as compared to 2SLS because 2SLS neglects any information that could be available with respect to the error covariances as well as supplementary information which dependent variables of other equations could have (Books, 2008). All the independent variables are employed as instruments in the process of estimation. The equations to be estimated using this method of three-stage least squares (3SLS) are government expenditure equation 3.75 and government revenue equation 3.76.

3.4.4 Error correction mechanism

The error correction mechanism (ECM) is employed to examine the determinants of the real money supply. This involves the estimation of error correction forms of equation 3.92. Most macroeconomic time series often contain unit roots and their estimation in an equation formulated is likely to produce spurious results. In order to remove the estimation bias, such time series could be transformed to stationarity by differencing. Engle and Granger (1987) representation theorem shows that if two series are co-integrated, the dynamic relationship between the two variables could be examined within the framework of an ECM. To derive ECM from the co-integrating equation, the lagged error correction term is included to recover information forgone in the long run properties of the variables through the differencing of the variables. Two variables if co-integrated of order one can be modelled by ECM to establish the long run relationship between them. The ECM is derived from the autoregressive distributive lag model by imposing certain restrictions on the parameters. Thus, the ECM representation is given as:

$$\Delta y = \alpha + \beta \Delta x_t - \varphi ECM_{t-1} \qquad 3.92$$

The error correction representation of equation shows the short run and long run dynamics. The coefficients of the regressors show the short run effects and that of error correction term captures the short run effects of the long run dynamics. On the a priori, the coefficient of ECM is expected to be negative and significant. Also, the magnitude of this coefficient indicates the speed of adjustment to the long run equilibrium. Brooks (2008) notes that error correction mechanism has long run solution and combines the use of first difference and lagged levels of co-integrated variables to provide information about whether two or more variables have an equilibrium relationship. The model is also known as equilibrium correction model because it corrects the past period disequilibrium of the system.

Asteriou and Hall (2007) also point out the justification for the importance of ECM. Firstly, suppose there is co-integration, ECMs are usually modelled with respect to first differences which get rid of trends from the variable included, in which case they neutralize the problems associated with spurious regressions. Secondly, ECMs make it easy to fit into general to specific approach to modelling of econometric which involves parsimonious ECM model that fit the data sets appropriately. Thirdly, the disequilibrium error term is a variable which is stationary as defined by co-integration. Consequently, this implies that, since the two variables are co-integrated, there are some processes of adjustment which make it impossible for the errors in the long run relationship to increase in size. Therefore, the employment of the ECM technique in this study is deemed appropriate and essential. The model to be estimated using error correction mechanism (ECM) is money supply equation 3.78.

3.4.5 Autoregressive distributed lag approach

Autoregressive distributed lag (ARDL) approach of Perasan and Shin (1999), and Perasan, Shin and Smith (2001) is applied for the bound testing of co-integration among the price level, real money supply, government fiscal deficit, interest rate and real output. The adoption of the approach is considered desirable because it provides opportunity to test whether or not there is long run association (co-integration) among the variables not minding whether the explanatory variables (regressors) are integrated of order 0 or 1. Therefore, there is no need to pre-test the variables and this lessens the task involved in deciding the order of integration. Furthermore, the method of bounds testing is advantageous in that it possesses better properties that accommodate small sample size more than the Engle and Granger (1987), and Johansen and Juselius (1990) procedure of co-integration (Narayan & Smyth, 2005). The approach of ARDL also gives room for different optimum lags to be assigned to variables which cannot be possible while using the conventional approaches to co-integration. In addition, the ARDL approach makes use of single reduced form equation as compared to the convectional approach of co-integration where estimation of long run associations is done within a system equation (Ozturk & Acaravci, 2010).

The steps involved in bound testing for co-integration requires the estimation of the unrestricted error correction model of the form of equation 3.93 where each of the variables subsequently takes turn to serve as endogenous variable after the others.

$$\Delta lnP_t = \gamma_0 + \sum_{i=1}^{k} \gamma_1 \Delta lnP_{t-i} + \sum_{i=0}^{k} \gamma_2 \Delta lnMS_{t-i} + \sum_{i=0}^{k} \gamma_3 \Delta GFD_{t-i} + \sum_{i=0}^{k} \gamma_4 \Delta lnIR_{t-i} + \sum_{i=0}^{k} \gamma_5 \Delta lnRY_{t-i}$$
$$+ \alpha_1 lnP_{t-1} + \alpha_2 lnMS_{t-1} + \alpha_3 GFD_{t-1} + \alpha_4 lnIR_{t-1} + \alpha_5 lnRY_{t-1} + U_t \qquad 3.93$$

From the equation 3.93, Δ is the first difference operator, ln is the natural logarithm, K is the optimum lag, P is the price level (inflation), MS is the real money supply, GFD is the government fiscal deficit, IR is the interest rate and RY is the real gross domestic product (real output) and U is the error term. All the variables are in natural logarithm form with the exception of government fiscal deficit. The equation 3.93 provides the opportunity to establish whether there is long run association among the variables. To do this, Pesaran et al. (2001) bound test procedure is employed as the first step of ARDL approach to co-integration whose determination relies on Wald statistics or F-test. The null hypothesis that the variables are not co-integrated is stated as H_0: $\alpha_1 = \alpha_2 = \alpha_3 = \alpha_4 = \alpha_5 = 0$ against the alternative hypothesis that the variables have long run association, stated as H_1: $\alpha_1 \neq \alpha_2 \neq \alpha_3 \neq \alpha_4 \neq \alpha_5 \neq 0$. These specifications are applicable to the equation 3.93. The F-statistics test the joint significance of the parameter estimates. The F-test employed in the bound test has a non-standard distribution.

Perasan et al. (2001) have two levels of critical value (lower and upper) in respect of the level of chosen significance. The assumption of the lower level of critical value is that all variables are integrated of order 0 or I(0) while the upper level of critical value is of the assumption that all variables are integrated of order 1 or I(1). To take decision, the F-statistics are compared with the two levels of the critical value, from the chosen ARDL model whether it has intercept and/or trend. According to the rules, reject the null hypothesis and accept that there is presence of co-integration if the F-statistics computed is more than the upper level of critical value. On the other hand, accept the null hypothesis that co-integration is not present if the F-statistics calculated is lesser than the lower level of critical value. If the value of F-statistics calculated is greater than the lower level but lesser than the upper level of critical value, then the test is inconclusive.

Following the establishment of the existence of long run association, Granger causality test is performed to determine the short run and long run causalities between a pair of variable. Engle and Granger (1987) incorporate the idea of co-integration into causality. Given that the variables have long run relationships according to Granger, causal association among the variables could be investigated by modelling the series where co-integration exists with augmented one period lagged error correction term. By following Narayan and Smyth (2005) a multivariate K^{th} order VECM is specified in equation 3.94 for Granger causality test.

$$
(I-L)\begin{bmatrix} \ln P_t \\ \ln MS_t \\ GFD_t \\ \ln IR_t \\ \ln RY_t \end{bmatrix} = \begin{bmatrix} \gamma_1 \\ \gamma_2 \\ \gamma_3 \\ \gamma_4 \\ \gamma_5 \end{bmatrix} + \sum_{i=1}^{k} (I-L) \begin{bmatrix} \alpha_{11i} & \alpha_{12i} & \alpha_{13i} & \alpha_{14i} & \alpha_{15i} \\ \alpha_{21i} & \alpha_{22i} & \alpha_{23i} & \alpha_{24i} & \alpha_{25i} \\ \alpha_{31i} & \alpha_{32i} & \alpha_{33i} & \alpha_{34i} & \alpha_{35i} \\ \alpha_{41i} & \alpha_{42i} & \alpha_{43i} & \alpha_{44i} & \alpha_{45i} \\ \alpha_{51i} & \alpha_{52i} & \alpha_{53i} & \alpha_{54i} & \alpha_{55i} \end{bmatrix} \begin{bmatrix} \ln P_{t-i} \\ \ln MS_{t-i} \\ GFD_{t-i} \\ \ln IR_{t-i} \\ \ln RY_{t-i} \end{bmatrix}
$$

$$
+ \begin{bmatrix} \beta_1 / 0 \\ \beta_2 / 0 \\ \beta_3 / 0 \\ \beta_4 / 0 \\ \beta_5 / 0 \end{bmatrix} \begin{bmatrix} ECT_{t-1} \end{bmatrix} + \begin{bmatrix} e_{1t} \\ e_{2t} \\ e_{3t} \\ e_{4t} \\ e_{5t} \end{bmatrix} \qquad 3.94
$$

From the equation 3.94, (I-L) represents the difference operator, k is the optimum lag, and e is the uncorrelated random error term for each respective equation. The series where co-integration exists is augmented with one period lagged error correction term (ECT_{t-1}) with its coefficient represented by respective β. On the other hand, in any equation where there is no co-integration among the variables, the error correction term (ECT_{t-1}) is not included in the modelling of the series for Granger causality test and so its coefficient is represented by 0 instead of β. The term (ECT_{t-1}) is collected from the long run co-integration association. As described in equation 3.94, the previous values of the endogenous variable and those of other exogenous variables are included in the regression of the endogenous variable concerned.

3.4.6 Dynamic ordinary least squares

To estimate the monetary model of Exchange Market Pressure, the study employs the leads and lags regression of Stock and Watson (1993), otherwise known as dynamic ordinary least squares (DOLS) regression. Stock and Watson augment a static regression equation with leads and lags of the first differences of the regressors and it yields efficient estimators just like one based on the semiparametric method. This is called dynamic OLS regression. The leads and lags regression has the fundamental objective of obtaining efficient parameter estimates with normal distribution (Choi & Kurozumi 2008). The DOLS is single equation method of estimation which has the main advantage of allowing for the inclusion of both variables with $I(0)$ and $I(1)$ variables in a system of equation. This has to do with the regression of variables with $I(1)$ over the rest variables (regressors) such as independent variables with $I(1)$, any exogenous variables with $I(0)$, leads of the first difference (or change) of any independent variables with $I(1)$, lags of the first difference (or change) of any exogenous variables with $I(1)$. This arrangement solves the problems associated with endogeneity and biasness associated with small sample, thus making the estimates to be robust (Stock & Watson, 1993). The static ordinary least square is given in equation 3.95 with one independent and one dependent variable:

$$y = \beta_0 + \beta_1 x \qquad 3.95$$

By following Stock and Watson (1993), an arbitrary leads and lags are chosen. This is followed by adding the first difference of independent variable (Δx), lead of the first difference of the independent variable [Δx (+1)] and lag of the first difference of the independent variable [Δx (-1)] as specified in the equation 3.96.

$$y = \beta_0 + \beta_2 x + \beta_3 \Delta x + \beta_4 \Delta x\,(+1) + \beta_5 \Delta x\,(-1) \quad 3.96$$

Equation 3.96 is known as dynamic ordinary least squares (DOLS) in which the point estimate of (β_2) is obtainable after regression. DOLS regression employs Newey-West estimator in order to further address the likely problem of autocorrelation and heteroscedasticity associated with the model's error terms overtime. In addition, by employing the estimator procedure it corrects the standard errors of the parameter estimates to achieve its robustness (Newey & West, 1987). The equations to be estimated using DOLS approach include EMP equation 3.82, EMP with variable (S) equation 3.83, international reserve equation 3.84 and exchange rate equation 3.85.

3.4.7 Diagnostic tests

In order to be sure that all the estimations are efficient, robust and free of biasness, diagnostic tests are performed. For example, Breusch- Godfrey test is conducted to verify the null hypothesis that there is no serial correlation. This test is superior to Durbin Watson test which has the assumption that the regression models do not include the lagged values of the regressand (dependent variable), for if it does include it, the values in that cases is always around 2, which will suggest that there is no first order serial correlation in that model. Therefore, Durbin Watson lost its power once the lagged value of endogenous variable is included in a model (Gujarati & Porter, 2009). For verification of the normal distribution of the residuals associated with the regression model, Jargue and Bera (1980) test of normality is also performed. Other means of testing normality involve the evaluation of the descriptive statistics such as Skewness and Kurtosis. For functional form or correct specification of the equation, Ramsey

(1969) test is conducted. Finally, autoregressive conditional heteroscedasticity (ARCH) effect is tested to confirm if the model suffers from heteroscedasticity.

3.5 Sources of Data

The study employed annual time series data collected from both local and international sources. In particular, data are sourced from the Central Bank of Nigeria, the Federal Office of Statistics, and World Bank indicators. The data cover the period 1970 to 2010. Budgetary data, statistics on the balance of payments, inflation rate and external debt were obtained from the various issues of the Annual Reports and Statements of Accounts and Statistical Bulletin from the Central Bank of Nigeria (CBN). Data on government expenditures and revenues were collected from the Federal Office of Statistics Lagos Nigeria (National Bureau of Statistics Abuja Nigeria). The consumer price index data for Nigeria were sourced from the World Bank African Development Indicators. Data on the world price (US consumer price index) were also collected from World Bank Development Indicators. Data on real income (gross domestic product), exchange rate, and the interest rate were also sourced from the CBN. The broad money supply M2 in nominal form was divided by consumer price index to get the real monay supply.

CHAPTER FOUR

FISCAL, MONETARY AND BALANCE OF PAYMENT DEVELOPMENTS IN NIGERIA

4.0 Introduction

In order to achieve the research objective one (To analyze the fiscal, monetary and balance of payment developments in Nigeria), this chapter addresses the research question: "What are the historical trends in the development of budgetary and balance of payments in Nigeria?" by analyzing the structure of the Nigerian economy as well as its growth. It also analyzes the fiscal developments in the economy, under which the performance of the government revenue, expenditure and consolidated fiscal balance are discussed. The trends of Nigeria's consolidated public debt stock (external and domestic debts) are also analyzed. Finally, the analysis of the monetary and balance of payments developments in Nigeria is done.

4.1 Nigerian Economic Growth and Structure

The structure of Nigerian economy is heavily dependent on oil. The economy has faced some challenges as a result of inappropriate fiscal policies, unrest in politics, and corruption. However, the country has been growing fast since the inception of democracy and the implementation of various economic reforms. For example, Nigeria has carried out a development plan of five years, structural adjustment program, rolling plan of three years twice and lastly, three vision documents over the years between 1962 and 2020. The fundamental objective of these was to improve the economic growth of the country with a view to achieving sustainable and fast socio-economic development in order to place the economy at the highest level in the world come 2020. However, the performance of the economy in term of growth has not been stable and met up with the expectation in line with the development plan carried out. For instance, the world development indicators showed that from 1960 to 2010, the average GDP growth of Nigeria amounted to 4% annually. As derived from Table 4.1, per-capital real GDP gives an average of 1.43% over the same period.

Table 4.1

Selected macroeconomic indicators in Nigeria

Economic Indicators	1970	1980	1990	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
GDP growth %	13.9	3.4	8.2	5.4	4.6	3.5	9.6	6.6	5.8	5.3	5.7	6.0	6.7
Oil sector growth %	5.8	9.6	5.6	11.1	5.2	-5.2	23.9	3.3	-1.7	-3.7	-5.9	- 6.2	-1.3
Non oil sector growth %	4.2	3.9	8.6	4.4	2.9	4.5	5.2	7.8	8.4	9.5	9.2	9.0	8.3

Sources: (i) CBN Annual Reports and Statement of Accounts various issues 2005; 2009. (ii) CBN Statistical Bulletin vol. 11, 2000 & vol. 17, 2006. (iii) National Bureau of Statistics (NBS), 2005.

From Table 4.1, the highest level of GDP growth was recorded in 1970. Perhaps this was because of the focus of attention at achieving the highest possible rate of growth targeted in the second post-independence national development plan (1970-1974). It was the expectation of the plan to realize the real GDP growth rate average 6.6% yearly but this target was surpassed with the average growth rate recording 13.9% over the plan period. However, during the period 1970-2009, the real GDP only recorded the lowest value of 3.4% during the first quarter of 1980s. This might not be unconnected with the relatively low level of production in the economy due to sudden experience of oil glut of 1980s in the world oil market. This development did not go well when related to the targeted plan of 9.5% and 4.0% annual average real growth rate in the 3rd and 4th National Development Plan of (1975-1980) and (1981-1985), respectively. Financial constraint could be the cause of the failure for the achievement of the 3rd and 4th development plans.

In the light of these developments in the Nigerian economy in the mid 1980s, the government and the economists deemed it important to make some structural adjustment program (SAP) which was introduced in 1986. The SAP has the objectives of changing and restructuring thr patterns of consumption and production in the economy, getting rid of price fluctuations, diversification of the economy from total reliance on crude oil export, and looking inward without reliance on importation of consumer as well as producer goods. The fundamental elements of SAP include getting rid of sophisticated administrative controls, rescheduling of country's debt, carrying out a realizable policies of exchange rate, well planning structure of tariff to promote exportations rather than importations, employing the mechanism of market force for pricing in every sectors of the economy. Other elements of SAP were to rationalize and restructure the public spending, and finally, privatize and commercialize the government enterprises. SAP was considered suitable for sustainable growth and development of the country since the five years planning model has not been realistic. Besides, the country relies on oil income whose price and quantity are determined externally and whose volatile nature has made it complex to plan on its income for a long period. Therefore, a three-year rolling plan was conducted to manage the economy during the last quarter of 1988 and since then there had been remarkable improvement in the economic growth. For example, Table 4.1 reveals significant performances in output since 1990 to 2005 except in 2002 when it fell to 3.5% after which it rose again.

In the year 2005, according to (Millennium development goal, MDG, 2010), the macroeconomic environment of Nigeria has reasonably been enhanced as contrary to 1990s when the economy was viewed around the world as the most volatile one. Specifically, the macroeconomic performance since 2005 has been better off with sound fiscal and debt maintenance, and increase economic growth. In 1990s period, growth had almost recorded 1%, but had risen to and maintained about 6%, right from the inception of democracy in 1999. Since this period, efforts were being made to rebuild the legacy of states' deficiencies. Each tier of governments such as federal, state and local started a well planned reform by Integrating the Millennium Development Growth in the strategies to develop the nation. Efforts were made at providing more innovative reforms, financing and proper coordination. Sackey (2011), notes that economic development entails making proper decision regarding the basic economic problems of what, how, and to whom to produce in order to ensure improvement in the people's standard of living on the one hand, and proper decision making on the other, entails the involvement of shared authority as it states how governments is related to the governed. Therefore, for economic development to be effective there could be a need to incorporate decentralized governance as well as the principles of democracy to widen the dialogue.

The economic growth was robust in 2009 considering the global financial or economic crisis that seriously affected the performance of the economy. The real growth recorded in 2009 rose by 6.7% as distinct from that of 6.0% recorded for 2008 and the average annual growth rate recorded for the period 2005-2009 was 6% (from Table 4.1). However, this was lower than the projected annual growth rate of 10.0% for the year.

The percentage of oil sector growth had been improved in 1980 recording 9.5% as against 5.8% in 1970, marking the period of oil glut in the world market. Just after this period of oil boom in Nigeria, the percentage of growth of the sector has been falling till 2009. Notwithstanding, it could be summarized that the oil sector constituted less than 25% of GDP, even though it sourced about 95% of foreign exchange earnings and generated almost 65% of Nigerian government revenues (CBN, 2010).

The non-oil sector has largely contributed to the growth of the Nigerian economy and its percentage growth rate is displayed in Table 4.1. Most significant contributors to this non-oil sector were the agriculture and services. The percentages of the non-oil sector growth fluctuated from 1970-2004 after which it started rising from 2005-2008. The economic growth in 2009 was significantly associated with the improvement in the non-oil sector which increased by 8.3%, complemented by a great reduction in the fall in output of oil sector.

Table 4.2 shows the composition of GDP as the share of agriculture, industry, services and others. Data from the table show that agriculture had been ahead of others among the sectors, even though its share of economic growth had largely been decreasing from 64.3% in 1960 to 44.7% in 1970, but it picked up and increased again more than 40%. The fall in agriculture share of GDP could be traced to the quick improvement in the oil and gas sector in the 1970s and 1980s.

Table 4.2

Sectoral growth rates of GDP at constant basic prices

Activity Sector	1960	1970	1980	1990	2000	2003	2004	2005	2006	2007	2008	2009
Agriculture In %	64.3	44.7	20.6	31.5	35.8	6.6	6.5	7.06	7.40	7.19	6.54	5.94
Industry In %	5.8	19.4	34.6	43.2	37	21.3	4.2	1.71	-2.51	-2.23	-2.18	0.62
Services In %	29.9	35.9	44.8	25.3	27.2	0.4	8.8	7.96	9.18	9.88	10.45	10.88

Sources: (i) Data for 1960 to 2000 were obtained from James (2011, Table 1). (ii) Data for 2003 and 2004 are from CBN annual report and statement of account 2007 (iii) Data for 2005 to 2009 are from CBN annual report & statement of account 2009.

The booms in oil around 1970s had been used to facilitate growth. To this end there was fast improvement in industry and service sectors which raised the economic growth to 14% level and annually averaged 8% from 1970-2000. However, due to financial, and internal capacity constraints coupled with the fall in the world price of oil that had negatively affected the 3rd development plan (1981-85), the achievement of the significant growth recorded in the economy during this period could not last long. There was significant decrease in agricultural share in GDP during post independence, but this was not caused by the expansion in industrial and service sector rather it was due to a sudden improved development in petroleum and gas sector (CBN, 2002). This could be the genuine reason for an increasing trend in agricultural contribution to GDP since 2000.

The real GDP increased from 5.3% in 2006 to 5.7% in 2007 and had an average growth rate of 7.0% over the period 2003 to 2007. The unique growth recorded was greatly the result of appropriate monetary, fiscal and credit conditions that had given room for the financing of the private sector; a reasonable good and foreign exchange market stability; and lastly, due to a non violent political handling over from one civilian authorities to another. This growth was absolutely facilitated by the non oil sector such as the agric subsector which grew by 7.4%, service sector grew by 9.8% while industrial output fell by 3.1% as a result of weak performance of the oil sector.

Furthermore, the real GDP indicated a growth rate of 6.7% in 2009. This was greater than the 6.0% recorded in 2008 and average annual growth rate of 5.9% for the period 2005-2009. However, it was below the projected growth rate of 10.0% for the year. Just as it was in the year before, agriculture contributed a larger share of 5.94% to GDP growth rate, services accounted for 10.8% GDP growth rate while industrial sector contributed positively with 0.62% growth rate of GDP as distinct from a negative contribution made in 2008. The improvement in GDP was attributed to the appropriate monetary and fiscal policies pursued, and the weather condition which favoured the increase in agricultural output.

The transformation in the economic structure entails the shifting of the activities of economy from agriculture sector into industry and services in the urban sector. Agriculture might be less important relatively at the time of structural transformation process, it still continued to prosper and generated large share in economic growth of the country, United Nation Economic Commission for Africa (UNECA, 2005). This is because the growth of agricultural products and incomes are essential for this structural change (James, 2011). When income from farm rises, it facilitates a derived demand for other goods which are not from the farm and causes the small and medium-size enterprises in rural and urban areas to develop (Timmer & Akkus, 2008).

4.2 Fiscal Developments

Fiscal developments deal with the analysis of the performance of the federal government revenue and the trends in the expenditure development of the federal government of Nigeria. It also gives analysis of the consolidated government fiscal balance for the understanding of the deviation in governments' spending in relation to its income generated. Finally, fiscal developments deal with the analysis of the consolidated federal government debts (domestic and external) in order to know the country's position in debt accumulation.

4.2.1 Performance of government revenue

Nigeria had enjoyed increase inflow of foreign exchange due to frequent increase in the price of crude oil in 1970s and 1981. For example, the prices of crude oil were US$2.0/barrel and US$4.1/barrel in 1972 and 1973, respectively. The price rose rapidly to US$4.7/barrel, US$14.33/barrel, US$29.29/barrel, and US$37.00/barrel in 1977, 1978 1979 and 1980 respectively and only to rise to US$40.00/barrel in 1981. These sudden increase in oil export revenue was probably due to the result of crisis in the Middle East, particularly the war between Arab and Israeli during the year 1973-1975 (Yom Kippur war in the year 1973) which boosted the average annual value of Nigerian export (CBN, 1985). The increase in revenue was reflected in the federally-collected revenue as shown in Table 4.3.

From Table 4.3, (US$ 1.00 = #153.05 where the symbol # represents the Nigerian currency, Naira) the federally-collected revenue which was #0.6 billion or 12.3% of GDP in 1970 rose to #5.5 billion or 26.3% of GDP in 1975 and to #15.2 billion or 30.7%

of GDP in 1980. However, the revenue began to fall from the following year, 1981 at a decreasing rate till 1984 when the rate of decline changed to an increasing rate. It got to the highest possible level of #14.7billion or 20.8% of GDP in 1985 after which it increased again to #85.3 billion or 31.4% of GDP in 1990.

Table 4.3
Structure of the Nigeria federal government revenue

Years	1970	1975	1980	1985	1990	1995	2000	2005	2006	2007	2008	2009
Federally Collected Revenue (FCR)	0.6	5.5	15.2	14.7	85.3	460.0	1906.2	5547.5	5965.1	5715.6	7866.6	4844.6
Shares of Oil in FCR	0.2	4.3	12.4	10.9	71.9	324.5	1591.7	4762.4	5287.6	4462.9	6530.6	3191.9
Shares of Non-oil in FCR	0.5	1.2	2.9	3.8	13.4	135.4	314.5	785.1	677.5	1200.8	1336.0	1652.7
Federally Retained Revenue	0.4	5.5	13.0	10.0	38.2	249.8	597.3	1660.7	1836.6	2333.7	3193.4	2643.0

Source: Central Bank of Nigeria Statistical Bulletin, (2010). Note: The figures are in billions Naira. USD 1.00= #153.05 (# representing the Nigeria naira).

The fluctuation experienced in the federally-collected revenue during the period 1970-1990 reflected the changes in the international price of crude oil as Nigeria is one of the major oil exporting countries. In addition, the rise in federally collected revenue from 1986 to 1990 was not unconnected with the devaluation of the country's currency following the implementation of structural adjustment program in 1986 which considerably made export to be cheap. Since 1990, the value of the federally-collected revenue rose through 1995 till 2000 with the estimated figure of #460.0 billion or 23.8% of GDP in 1995 and #1,906.2 billion or 40.3% of GDP in 2000.

The rise in the federally collected revenue still continued up to 2006. At 2007 the revenue declined by #249.6 billion when compared with the amount in 2006, and increased again in the following year, 2008 by #2,151.6 billion. In 2009, there was also a fall in the total federally collected revenue to the amount of #4,844.6 billion, which is equivalent to 38.4%. This decline represented 19.4% of the country gross domestic product. The increase or decrease (fluctuation) in the federally collected revenue from 2006 to 2009 could significantly be linked to the decrease in the production of crude oil domestically and its exports. These resulted from the problem faced with the militants' behaviour in the Niger Delta of the country. The situation could also be traced to the decrease in the prices of oil in the world oil market especially during the early months of 2009.

From Table 4.3, the federally retained revenue of the government reflected the same pattern of trends as that of federally collected revenue such that it also rose from #0.4 billion in 1970 to #5.5 billion in 1975. From 1975, it increased to #13 billion or 26.2% in 1980, after which it started falling till 1985. It rose from 1987 and continued till 2000 with the values of #16.1 or 14.9%, #38.2 or 14.0%, #249.8 or 12.9%, and #597.3 or 12.6% for the following respective year, 1987, 1990, 1995, and 2000. The federally retained revenue increased considerably and doubled up from 2005 to 2008 when compared with the amount in year 2000. However, the federal government retained revenue declined to #2646.9 billion in 2009 compared to the previous year, 2008.

The significant performance of Nigerian oil and non-oil shares of total revenue could also be noticed from Table 4.3. The share of oil in the total income of government steadily increased from #0.21 billion in 970 to #71.9 billion in1990. The sharp increase in the shares of oil in the federally collected revenue continued from1996 till 2006.

However, in 2007, there was a sharp decline in the share of oil in total revenue by #824.7 billion or by 6.9% of GDP when compared with the value in 2006 and only for the total share value to increase again to #6530.6 billion or 27.4% of GDP in 2008. The share of oil in total revenue fell to 12.9% of GDP to #3191.9 billion in 2009 when compared with the amount in 2008. The fluctuation of the share of oil in federally collected revenue from 2006 to 2009 reflected the disturbance activities of the Nigerian Niger Delta militants in the production field. The data indicated that any change in the output of oil would have a proportional significant change in the total revenue collected.

The performance of non-oil shares to the federal revenue was also impressive during the period of analysis 1970-2009. The data in Table 4.3 indicates a positive trend in the shares of non-oil in total revenue. For example, the shares considerably rose from 1970 to 2005. This might be due to the effort of government in focusing attention on the diversification of the economy considering the volatile and unstable nature of the world prices of oil. The non performance of the international oil market has for instance made the government of Nigeria to embark on the implementation of Structural Adjustment Programme (SAP) in 1986 to improve the productive base of the economy in order to gear up the income from non-oil.

As a result, the non oil sector improved and reflected an increase in the revenue realized from it to the amount of #785.1billion in 2005 or 5.8% of GDP. Unfortunately, this could not be sustained as it declined to # 677.5billion or 4.1% of GDP in 2006. It rose again by 1.9% of GDP to the amount of #1200.8 billion in 2007. In fact Non-oil contribution to Gross revenue increased by 23.7% to #1652.7 billion in 2009. The revenue increase from non-oil sources was weakened by the fall of 35.8% in independent revenue of the central government. However, due to the efforts of governments in boosting income from non-oil sources, the percentage of non-oil to GDP ratio rose to 6.7% or about #1652.7 billion in 2009, beyond the 5.6% in 2008.

4.2.2 Performance of government expenditure

In any economy, the key economic agent with the role of encouraging economic, social and political development is the government. Therefore, efforts have been made by the government since the attainment of independence to achieve these objectives through developmental plans and reforms. Given the low income and saving rate in the economy, government had decided to improve the economy by directly involve in public investments to promote capital accumulation. Furthermore, due to the dominant role played by the foreign firms in the main sectors of the economy as a result of lack of adequate indigenous capacity, government decided to promulgate Indigenization Decree in 1972. This development stepped up government's actions to be actively involved in the production activities, providing social amenities and education services at all levels. This has unavoidably increased the total expenditure of the Nigerian government since independence without achieving the anticipated revenue from these public enterprises.

Table 4.4 shows the trends in the expansionary fiscal policy pursed in Nigeria from 1970-2009. From Table 4.4, there was an upward trend in the federal expenditure from the lower level of #0.9 billion to #15.0 billion in 1980 but this could not be sustained as it dropped in 1985 to 19.1% of GDP or #13.0 billion from 30.2% of GDP when compared with 1980. The decline in the total expenditure from #15.0 billion in 1980 to

#13.0 billion in 1985 could be attributed to the demand management measures executed in the early 1980s to tackle the fiscal imbalance that resulted from unexpected decline in government revenue due to a decline in the world price of crude oil.

From Table 4.4, it is also indicated that since 1990 the upward movement in the federal expenditure had been spectacular and sustainable till 2009 while the total expenditure as percentage of GDP fluctuated during the period.

Table 4.4

Total, recurrent and capital expenditure profile in Nigeria

Years	1970	’75	’80	’85	’90	’95	2000	2005	2006	2007	2008	2009
Total Expenditure (#b)	0.9	5.9	15.0	13.0	60.3	248.8	701.1	1822.1	1938.0	2450.9	3240.8	3453.0
TE as % GDP	17.0	18.1	30.2	19.1	22.5	12.9	15.3	12.5	10.4	11.9	13.3	13.9
Recurrent Expenditure (#b)	0.7	2.7	4.6	7.6	36.2	127.6	461.6	1223.7	1290.2	1589.3	2117.4	2300.2
RE as % of TE	77.9	46.0	30.7	58.5	60.1	51.3	65.8	67.1	66.6	64.8	65.3	66.6
RE as % GDP	13.2	12.6	9.3	11.2	13.5	6.6	10.1	8.4	6.9	7.7	8.7	9.3
Capital Expenditure (#b)	0.2	3.2	10.2	5.5	24.0	121.1	239.5	519.5	552.4	559.3	1123.5	1152.8
CE as % of TE	19.5	54.2	68.0	42.3	39.8	48.7	34.2	28.5	28.5	31.0	34.7	33.4
CE as % GDP	3.8	14.9	20.6	8.1	9.0	6.3	5.2	3.6	3.0	3.7	4.6	4.6

Source: (i) Central Bank of Nigeria Statistical Bulletin, 2010. (ii) All percentages are computed. Note: TE= total expenditure; RE= recurrent expenditure; CE=capital expenditure and #b= Billion Naira; USD 1.00= #153.05 (# representing the Nigeria naira).

The spectacular increase in total expenditure of the federal government particularly from 2007 till 2009 was attributed to the world economic and financial crisis during the period. This motivated the called for the role of discretionary fiscal policy in Nigeria. Discretionary fiscal policy involves the deliberate altering of government expenditure and/tax policies to affect aggregate demand level. In response to the impacts of the global economic meltdown on Nigeria economy, the federal government started a fiscal stimulus (expansionary fiscal policy) to alleviate the foreseeable slowdown of the growth of the economy and this significantly increased the total government expenditure during the period.

Comparison of the development indicates that the total expenditure increased by #1002.1billion or 2.0% as proportion of GDP in 2009 when compared with 2007. Similarly, the comparison of 2009 with 2008 shows that aggregate expenditure of the federal government rose by 6.7% to # 3453.0 billion in 2009. Considering the proportion of the total expenditure to the economic growth for the two years shows that the total expenditure increased to 13.9% in 2009 from 13.3% in the preceding year.

A breakdown of the total expenditures into recurrent and capital expenditure shows that recurrent expenditure dominates for the period of study. It considerably increased yearly more than an increase in capital expenditure except in 1975 and 1980 when it fell short of capital expenditure by #0.5billion and #5.6 billion, respectively. The recurrent expenditure has ranged from 30.7% to 77.9% of the total expenditure during 1970 to 1995 and from 64.8% to 67.1% of the total expenditure during the year 2000 to 2009. The factors responsible for this upward trend in recurrent expenditure during this period were attributed to the expansion of public sectors, a rise in the public administration spending, increase in government expenditure for the provision of social amenities like water services, universal primary education, and health services. Comparison of the development in recurrent expenditure shows that recurrent expenditure in 2009 stood at #2300.2, representing about 66.6% of the total expenditure and with the increase of

0.6% over the previous year's level. By relating it to GDP, recurrent expenditure fell to 8.7% in 2008 from 9.3% in 2009.

Development expenditure increased from a low level of #0.2 billion in 1970, got to a peak in 1980 with #10.2 billion or 20.6% of GDP and declined to #5.5 billion or 8.1% of GDP in 1985. The capital expenditure fluctuated from 1985 with 42.3% of the total expenditure to 39.8% in 1990 and stood at #24.0 billion. The fall in the development expenditure during this period may not be unconnected with the implementation of structural adjustment which required the boycott of some capital projects. In addition, some projects were also abandoned because of lack of enough foreign exchange to continue them during the period. By comparison, capital expenditure rose by 20.0% to #1152.8 billion in 2009 and represented 33.4% and 4.6% of the overall expenditure and economic growth, respectively. The capital expenditure as a ratio of the federal government revenue recorded 43.6% which surpassed the stated target of 20.0% under the West African Monetary Zone secondary convergence requirements (CBN, 2009).

Aggregates expenditure of the three tiers of government (local, state and federal) declined by 5.1% from the total of #7,258.0 billion in 2008 and when compared its ratio to economic growth, it stood for 29.4% as against 31.5% in 2008 (CBN, 2009).

4.2.3 Consolidated government fiscal balance

Nigeria after the independence in 1960 was of the view that fiscal policy performed a useful role as a tool for raising resources for the development and growth of the economy. For instance, from 1960 to 1963, the main objective of the government fiscal policy was directed towards the realization of surpluses resources which would be utilized for financing the execution of government projects and programs (Ogboru, 2006). To achieve this, government decided to raise taxes such as import tax increase and curtail its recurrent spending. Unfortunately, not enough revenues could be generated from the custom and excise duties due to the emergence of civil war in the country from 1967 to 1970 and this created a gap between government expenditure and income. Therefore, government had to resort to monetary means of financing this deficit. Consequence upon the civil war was the rise in government expenditure to bring the economy to the normal shape. It entailed spending on rehabilitation and reconstruction of social and economic infrastructure affected during the war. This further increased the government expenditure and marked the onset of fiscal imbalances in Nigeria (Ogboru, 2006).

Fiscal imbalances in the form of large budget deficit have been the frequent issues in Nigeria since 1975 according to the Central Bank data. For instance, the analysis of fiscal balance from 1970 to 2003 indicated that the consolidated government (including local, state and federal) overall fiscal balance as shown in Table 3 began with the surplus of 0.9% of GDP in 1970-74, though local and state governments not inclusive at that time. However, during 1975-79, fiscal deficit recorded amounted to 9.5% of GDP and this started rising until 1990-94 when it got to 10.6% of GDP. Despite the fact that central government contributed larger percentage to public deficit, the contribution of the state government had also become significant. This justifies the pressure of state on the federal government to decentralize and allow for fiscal autonomy between them. The important role of the state government has therefore reflected in the overall fiscal deficit.

During 1995-1999, the overall deficit declined to 2.6% of GDP and started rising again until it was 4% of GDP in 2000-2003. The analysis shows that there was lack of political willingness on the path of government to restructure the public spending in the advent of oil booms experienced by the Nigerian economy in 1970s and 80s. As a result, government spending far went beyond its revenue leading to fiscal deficits for most of the period. The period of structural adjustment program carried out in 1986 was also not left out of this fiscal deficit experience. At this period, the deficit recorded was 7.8% more than the targeted 3% of the GDP and the post-adjustment period also recorded fiscal deficit above this target, with the exception of 1985 in which the deficit recorded was lower than the targeted percentage. See Table 4.5 for the trends in the movement of the federal, state and local government fiscal balance.

Table 4.5

Nigeria government fiscal balances, 1970- 2009 period

Year	1970-74	1975-79	1980-84	1985-89	1990-94	1995-99	2000-2003	2004-2009
Federal (# Billion)	0.3	-0.7	-3.6	-8.9	-55.1	-78.1	-207.3	-810
State (# Billion)	NA	-1.8	-2.6	-0.6	-3.9	-0.1	-36.2	-86.8
Local (# Billion)	NA	NA	NA	NA	0.1	0.4	2.2	1.8
Total (# Billion)	NA	-3	-6.2	-9.5	-58.9	-77.7	-241.3	-166.0
Total % GDP	NA	-9.5	-11.3	-7.8	-10.6	-2.6	-4	-3.3
Federal % GDP	0.9	-2.6	-6.7	-7.2	-10	-2.4	-3.7	-2.8

Source: CBN Annual Report and Statement of Account, Various Issues (2003) for 1970-2003 data; CBN Annual Report and Statement of Account, Various Issues (2009) for 2004-2009 data. Note: USD 1.00= #153.05 (# representing the Nigeria naira).

It is better to take the direction of movement in the non-oil deficit into consideration since the Nigerian economy greatly relies on oil sector. The percentage of the share of non-oil balance in GDP had in 1970s been significantly impressive and recording surplus. However, in 1980s the non-oil balance as a share of GDP had recorded deficit and deteriorated from 2000 to 2003 with 22.4%, 28.4%, 24.1%, and 31.0%, respectively (CBN, 2003). The high deficit recorded in non-oil balance in 2003 was a reflection of the government execution of its economic reforms such as the monetization program, contributory pension scheme in which government contributed a lot. Furthermore, most of these fiscal balance deficits were recorded at the time government realized large income from the sudden rise in the world price of oil and the period naira lost its value.

In the light of this, the central government of Nigeria had in 2003 with the economic experts deliberated on the focus of attention on the prudent fiscal management to realize macroeconomic stability and to ensure that the country’s resources are judiciously used to enhance growth and services for the citizens. In order to pursue this, the central government puts up a strategic reform called the National Economic Empowerment and Development Strategy (NEEDS), through which the Fiscal Responsibility Act aimed at formulating new fiscal and financial management policies to promote fiscal commitment at the local, states and federal level.

The Nigerian fiscal balance (i.e. consolidated government fiscal balance due to the significant role of state in the economy) had improved rapidly by moving from the overall fiscal deficit of 4% of GDP in the previous year to a surplus of 7.7% of GDP in the year 2004. However, the overall deficit fluctuated with the low values until it reached 3.3% of GDP in 2009. The surplus recorded in 2004 indicated a considerable improvement in central government revenue as well as the positive effect of external debt rescheduled. In addition, it reflected the efforts of the newly elected government in introducing macroeconomic stability, and oil price shocks vulnerability reduction as the major economic objectives to be focussed. In order to realize these objectives, it was mandatory that the income from oil more than US$25 per barrel should be kept in reserves. Furthermore, home production of oil was to be increased while subsidy on home produced crude oil price was to decrease. These reasons in addition to a hike in international price of oil drove the income from it up. Similarly, government expenditure was drastically lessened in 2001 from 47% of GDP to 35.4% in 2004. Consequence upon these measures was the fiscal surplus of 7.7% of GDP recorded in 2004 as compared with 2003 deficit of 4% of GDP (CBN, 2005).

Unfortunately, this surplus advantage could not be maintained for long time as the deficits resurfaced again in 2005 though with a lower value of 1.1% of GDP. The overall deficit fluctuated with the low values of 1.1%, 0.5%, 0.6%, 0.2% and 3.3% of GDP for the year 2005, 2006, 2007, 2008 and 2009, respectively. Comparison of the overall fiscal performance of the central government shows the country's deficit of #810.0 billion, equivalent to 3.3 % of GDP in 2009 as distinct from the deficit of #47.4billion in 2008, equivalent to 0.2% of GDP (CBN, 2009). The performance of the fiscal deficit was more than that set as primary convergence target requirement of 4.0% by the West African Monetary Zone. The sources of financing this overall fiscal deficit were through borrowing from the domestic bank and non bank public.

It was observed that the contribution of oil to the revenues of Nigerian government has not been stable, but changes from 56% to 86% since 1981 due to the fluctuation in the crude oil prices. The changing nature of these oil prices has influenced the expenditure of government on social services to fluctuate, thereby causing insufficient provision of education and health services for the citizens. The problem of fluctuation in the incomes and spending of the Nigerian federal government was compounded by the autonomy enjoyed by the 36 states and 774 local governments, where by they directly had their allocations from the federal authority to executive their finance. As against the period of increase in the oil price, the three arms of government in 1990s had taken to the fiscal rule based on conservative oil price. This had motivated fiscal surplus performance in 2004 and considerably low level of budget deficit in the subsequent years. According to International Monetary Fund (IMF, 2005), Nigerian government took it as a plan since 2004 to put in saving any excess income resulting from oil in order to settle spending in the future. However, not all state governments were able to spread their excess revenue shared from oil to future uses.

Based on the available CBN data, there was suggestion that states as a group had a lower deficit of almost 0.5% of GDP as well as 4% of their total revenues over their fiscal operations between 2001 and 2003. Though this might be small in relative term, but the fact that both states and local government had benefitted from higher revenues for sometimes before had raised some concern. This implies that states could as well encounter fiscal problem as a consequence of sudden fall in the international prices of oil and this could influence the whole macroeconomic balance of the nation. Such situation also creates doubt on whether the states would be able to maintain its fiscal balance given the states' rising revenue. Furthermore, most of the states have been running deteriorating fiscal balance with which little is used from their revenues to finance their spending. Rather, they resort to borrowing from banks to finance these deficits and thus be left with compiled domestic arrears.

For example, state governments' finance revealed an overall rise in fiscal deficit from #86.8 billion in 2008 to #186.2 billion in 2009, equivalent to 0.4% and 0.8% of GDP, respectively. This deficit was financed by borrowing from domestic banks (CBN 2009). The directions of fiscal balance associated with the central, state and local government indicate that the system of Nigerian fiscal operation is pro-cyclical. That is, expenditure increases following the boom period when the revenue is rising.

4.2.4 Consolidated federal government debt

The consolidated debt stock of Nigerian federal government has been increasing since 1970 as shown in Table 4.6. The increase, especially in the late 70s was due to the jumbo loan resorted to by the government from the international capital market. The improved nature of Nigerian economy in the preceding decades gave the impression that the country was credit worthy and so permitted it to borrow heavily during 1978 to 1979. The total debt ranged from #1.3 billion to #3,995.7 billion from 1970 to 2009. The debt rose to #10.1 billion, #45.2 billion, #382.7 billion, and #1194.6 billion in 1980, '85, '90, and '95, respectively. The increase in total public debt from 1970 got to a peak level, #3,995.7 billion in 2000 and declined slightly by 6.38% or #6.38 billion in 2005 and sharply by 36.6% or #1462.2 billion in 2006 when compared with 2000. This development was a reflection of a decline in the total external debt as compared with the total domestic debt at those periods. Furthermore, the position of Nigeria's external debt had become better as a result of the advantage gained from the huge debt waived by the creditors for Nigeria. For example, an agreement had been reached and endorsed by Nigeria and Paris Club on October 20, 2005 over the 60% of Nigeria debt written off by the creditor, Paris Club (Paris Club, Press Release, Nigeria, 2005). This was a sequel to the IMF endorsement of the 2 years policy support instrument for Nigeria to compliment the efforts of government in reforming the economy with sound policies.

Table 4.6

Nigeria consolidated public debt stock

Years	1970	1975	1980	1985	1990	1995	2000	2005	2006	2007	2008	2009
Total Domestic Debt (TDD)	1.1	1.7	8.2	27.9	84.1	477.7	898.3	1275.1	2082.0	2941.8	2320.3	3228.0
Total External Debt (TED)	0.2	0.3	1.9	17.3	298.6	716.9	3097.4	2695.1	451.5	431.1	493.2	590.4
Total Debt (TDD+TED)	1.3	2.0	10.1	45.2	382.7	1194.6	3995.7	3970.2	2533.5	3372.9	2813.5	3818.4
Total Debt As % GDP	24.5	9.3	20.4	66.6	143.1	61.8	87.2	27.2	13.6	16.8	11.6	15.4
Total Domestic Debt as % GDP	20.8	7.9	16.5	41.1	31.8	24.7	19.6	8.8	11.2	14.2	9.6	13.0
Total External Debt as % GDP	3.8	1.4	3.8	25.5	111.6	37.1	67.6	18.5	2.4	2.1	2.0	2.4
Total Debt as % Total Revenue	325.0	36.4	77.7	452.0	1001.0	478.2	669.0	239.1	137.9	144.5	88.1	144.3

Source: Central Bank of Nigeria and Debt Management Office. Note: TDD, TED, and Total Debt are in Billion Naira. USD 1.00= #153.05 (# representing the Nigeria naira).

The policy support instrument was mainly prepared for the countries with low income (on their request) by the IMF to offer advice, monitor and approve those countries' policies. In the case of Nigeria, it was meant for the National Economic Empowerment and Development Strategy (NEEDS), and the Poverty reduction strategy. The debt forgiven amounted to US$18 billion. Substantial amounts of money are owned abroad by Nigerians through capital flight. Therefore, any decrease in debt will lead to a decrease in capital flight which in turn will motivate high investment and growth. Nigerian government would have to use the opportunity of newly freed-up resources to return funds to the productive economy, gear-up economic growth, and abate poverty. In 2009, the consolidated debt stock of the federal government stood at #3,818.5 billion or 15.4% of GDP as against #2813.5 or 11.6% of GDP in 2008.

A decomposition of the total federal government debt as shown in Table 4.6 indicates that the total domestic and external debt contributed 84.5% and 15.5% in 2009 respectively. The rise in the total domestic debt was to a greater extent attributed to the issuance of bonds and treasury bills by the federal government to obtain more net borrowing which was used to settle projects and meet other obligations such as contacts. From Table 4.6, comparison of the growth of external and domestic debt in 2009 showed that outstanding external debt rose by 19.7% to #590.4 as against the increase in domestic component from 2008 level by 39.1%. This implies that both domestic and external debt could not be sustained at their low level in 2008. However, the proportion of total debt stock to GDP showed that it was relatively low when compared with the 30% of GDP maximum international threshold despite the fact that it worsened from 2008 with 11.6% to 15.4% in 2009.

The holders of domestic debt outstanding comprise banking system and non-bank public. The banking system consists of Central Bank of Nigeria, commercial bank, and the merchant bank. Between these two broad holders (banking system and non-bank public), it was reported that banking system dominated in the holding of domestic debt instruments with 58.3% while the non-bank public was responsible for the remaining

41.7% (CBN, 2009). By decomposing the banking system's holding, commercial banks had dominated from 1970-2009 and had also taken the lead in 2009 with #1919.3 billion. This was followed by the Central Bank of Nigeria and merchant bank with #323.3 billion and #134.1 billion, respectively (CBN, 2009).

The structure of external debt outstanding comprises the Multilateral, Paris club, London club, Promissory note and others. Multilateral dominated in the share of total external debt outstanding according to the reports (CBN, 2009). The shares of multilateral in the external debt outstanding had been on increase since 1970 and amounted to #524.2 billion or 88.8% in 2009 as the highest share. The share of "Other" had been fluctuating since 1970 and amounted to #66.2 billion or the remaining 11.2% in 2009. The Paris club and London club had not been having any share since 2006 and the Promissory note had also not had any share since 2007 (CBN, 2009).

The analysis of the ratio of total debt stock to total revenue as shown in Table 4.6 indicates the weakest position in 1990 at 1001.8% when compared with other years under study, 1970-2009. Without doubt, the development could be attributed to the low productivity of the key sectors of the economy which considerably retarded the economy growth. In the same year, 1990, the percentage ratio of total external debt to GDP also reflected the situation by remaining at the highest level of 111.6% for the study period. Furthermore, the development in the current years indicated that the ratio of total debt to total revenue deteriorated from 144.5% in 2009 as distinct from 88.0% in 2008. This reflected the crawling nature of the economic growth as well as the weak performance of the central government retained revenue compared with the previous year. The implication is that larger size of total revenue will be needed to offset the total debt stock.

Table 4.7 shows that in 2009 the total debt service payment composed of total external debt service (amortization and interest payment) of #63.84 billion and the total domestic service (amortization and interest payment) of #478.7 billion. Therefore, the total debt service constituted 2.2% of GDP or #542.54 billion. Interestingly, the ratio of total debt service to GDP was maintained at 2.2% in 2009 when compared with the preceding year. Also, the ratio of total debt service to revenue worsened in 2009 with 20.5% from the 2008 level of 10.5%.

Table 4.7

Debt service payment and debt sustainability indicators

Indicators	2005	2006	2007	2008	2009
External Debt Service (Interest payment)	1,130.13	831.04	117.21	9.03	17.38
Amortization (External Debt)	51.41	34.50	11.39	46.16	46.46
Domestic Debt Service (Interest payment)	150.45	166.84	185.37	232.98	271.34
Amortization (Domestic Debt)	0.00	55.73	67.26	238.29	207.36
Total Debt Service	1,331.99	1,088.11	381.23	526.46	542.54
Total Debt Service/ Revenue (%)	18.8	23.3	13.9	10.5	20.5
Total Debt Service/ GDP (%)	9.1	5.9	1.9	2.2	2.2

Source: Central Bank of Nigeria, Annual Report and Statement of Account Various Issues. Note: USD 1.00= #153.05 (# representing the Nigeria naira); Debt Service Payment (in billion #)

This showed that above 20% of the total revenue was earmarked for the repayment of principal and interest on loan. In addition, the retained revenue of the government did not improve as expected and this was compounded by the weak economic growth.

However, from 2005-2009, the ratio of total debt service to revenue still fell within the minimum and maximum of international thresholds of 20% and 25% ,respectively.

4.3 Monetary and Credit Developments

An expansionary monetary and credit occasioned with fluctuations has been experienced in the Nigerian economy since 1970. For example, the growth in Broad money supply, M2 which composes the currency in circulation, demand deposits, time deposit and saving deposit averaged #1.44 billion, #7.24 billion and #18.74 billion between 1970-74, 1975-79 and 1980-84, respectively. The expansion in broad money in 1970s and early 1980s was due to the significant actions of government in implementing the Amendment Act of 1962 which empowered the Central Bank to improve the pursuant of effective monetary policy. Therefore, the Central Bank could carry out cheap monetary policy which allowed government to embark on cheap loans to fund the 2nd National Development Plan (Ogboru, 2006).

Consequently, the net credit to the government grew and averaged #0.26 billion, #1.52 billion and #11.28 billion over the period 1970-74, 1975-79 and 1980-84, respectively. During the same period, credit to private sector also increased and averaged #0.64 billion, #3.58 billion and #10.78 billion, respectively. This development contributed significantly to the growth of broad money supply with the consequence of inflation. In addition to this development, the civil war experienced by the country in 1970, and the wage rate increase implemented in 1971 by the Adebo Commission and in 1974 by the Udoji Commission had largely contributed to inflation growth during the period. Therefore, Nigerian inflation ranged from 1.3% to 18.55%, 6.18% to 43.48%, and

6.94% to 38.77% over the periods 1970-74, 1975-79, and 1980-84, respectively. However, a significant decline in inflation to a bare level of 1.03% in 1985 as compared with 22.63% in 1984 was recorded. This could be attributable to the Central Bank effort in using direct control measures such as credit persuasion given to commercial banks to direct large proportion of their credit to the real sectors of the economy to boost output and the use of interest rate policies to regulate the commercial banks deposited money.

Table 4.8

Monetary policy targets & outcomes on domestic credits

Variables	1985	1990	1995	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
NDC													
Actual	7.6	57.3	8.0	-25.3	79.9	56.6	35.7	12.0	14.5	-69.1	279.6	84.2	58.6
Target	7.2	13.5	11.3	27.8	15.8	57.9	25.7	22.5	22.5	-72.3	-29.9	66.0	87.0
NCG													
Actual	6.3	209.4	-8.7	-170.1	95.2	6320.6	58.4	-17.9	-37.0	-732.8	-22.3	-31.2	25.9
Target	7.1	10.9	5.6	37.8	2.6	96.6	-150.3	29.9	-10.9	-	-	-54.6	21.9
CPS													
Actual	9.6	19.5	40.0	30.9	43.5	11.8	26.8	26.6	30.8	32.1	91.6	59.5	26.1
Target	7.4	15.8	21.9	21.9	22.8	34.9	32.3	22.0	22.0	30.0	30.0	54.7	45.0

Source: Central Bank of Nigeria & National Bureau of Statistics (2010). NDC= Net domestic credit, NCG = Net credit to federal government, CPS = Growth in bank credit to private sectors; Growth Rate in %.

Table 4.9

Monetary policy targets & outcomes on money growth

Variables	1985	1990	1995	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
BM													
Actual	-	-	-	-	-	-	-	-	4.2	27.8	22.6	29.6	7.7
Target	-	-	-	-	-	-	-	-	6.5	7.5	3.3	20.8	3.6
M2													
Actual	12.4	45.9	19.4	48.1	27.0	21.6	24.1	14.0	24.4	443.1	44.8	57.9	17.1
Target	-	-	10.1	14.6	12.2	15.3	15.0	15.0	15.0	27.0	24.1	45.0	20.9
M1													
Actual	11.1	49.1	18.9	62.2	28.1	15.9	29.5	8.6	29.7	32.2	37.6	56.1	2.4
Target	6.5	1.3	9.4	9.8	4.3	12.4	13.8	10.8	11.4	-	-	-	32.2
Inflation													
Actual	1.0	3.6	51.6	14.5	16.5	12.2	23.8	10.0	11.6	8.6	6.6	15.1	13.9
Target	30.0	-	15.0	9.0	7.0	9.3	9.0	10.0	10.0	9.0	9.0	9.0	9.0

Source: Central Bank of Nigeria & National Bureau of Statistics 2010. Note: BM = Base money, M2= Growth in broad money, M1= Growth in narrow money; Growth Rate in %.

Domestic credit has played a significant role in the development of money supply to the economy. For example, Table 4.8 shows that the growth rate of the net domestic credit increased by 7.6% in 1985 to 57.3% in 1990 reflecting on the increase in growth rate of money supply by 45.9% in 1990 as compared with 12.5% in 1985 in Table 4.9. There was a tremendous rise in the growth rate of credit to government in 1990 by 209.4% from 6.3% in 1985 which was far beyond the benchmark of 10.9% set in 1990. This large government internal debt was a reflection of public deficit financing through monetary means. During the same period the growth of credit to private sector was also above the target level of 15.8% as it stood at 19.5% in 1990. The growth in money supply experienced over the period 1986 to 1990 implied that the Structural Adjustment Programme adopted in 1986 to address the structural economic problems had not been realistic. In addition, the monetary and credit policies implemented in 1987 which favoured the productive sectors in credit allocation had not actually been realized and consequently never improved the general prices level, investment and output in the economy.

One of the main concerns of the government was to regulate the monetary and credit growth but had not been realized effectively. For instance, in 1995, narrow money supply, MI grew from 18.9% to 62.2% in 2000 and to 27.0% in 2001 in Table 4.9. Similarly, the broad money supply, M2 in 1995 grew from19.4% to 48.1% in 2000 and to 28.1% in 2001. The tremendous growth in aggregate bank credit had been traced to an increasing dependent on money creation to finance public deficits and the monetization of oil flows which undoubtedly increased the growth rate of money supply. This case was noticed from 1985 when the aggregate credit increased from 8.0% and fluctuated with some negative growth to 79.9% in 2001. During the period the net credit to government which almost recorded negative growth through out, stood at 95.2% in 2001 while credit to private sector stood at 43.5%. Inflation (in Table 4.9) which was 51.6% in 1995 declined to14.5% in 2000 and increased to16.5% in 2001. The growths as shown by all indicators were above the benchmark in those years.

Between 2001 and 2006, the growth in broad and narrow money exceeded their benchmarks except in 2004 when the actual results 14.0% and 8.6% were below the targets of 15.0% and 10.8%, respectively. Inflation in 2004 however, stood at 10.0% to hit the target. CBN (2010) data as shown in Table 4.8 indicates that broad money supply grew by 443.1% compared with the set benchmark of 27.0% while the narrow money stood at 32.2% in the same fiscal year, 2006. The large increase in the supply of money at this period was traceable to the tremendous rise in the net foreign asset of the banking system. This was brought about by the consistent rise in the prices of crude oil in the world oil market. Net domestic credit declined by 69.1% in 2006 which considerably reflected in a large decline in the net credit to the government by 732.8% in the same year. Conversely, the credit to the private sector grew by 32.1%, closed to the target of 30.0% in 2006 while inflation stood at 8.6%, closed to the target of 9.0%.

The development in 2007 was such that broad money grew by 37.6% but lesser than the percentage in the preceding year while narrow money recorded 44.8%, slightly more than the one recorded in the previous year. In the same year, aggregate credit grew by 279.6% reflecting a negative fall in net credit to the federal government and a 91.6%

growth in credit to private sector. Inflation in 2007 was also lower than the one recorded in the preceding year.

In 2009, there was moderation in the monetary growth not withstanding the fiscal expansion and measures embarked upon in the banking system in the last quarter of the fiscal year to soften the tight liquidity situation with a view to rebuilding confidence in the country's financial markets. Therefore, money supply grew at the level below the indicative target since 2005, the development which was first of its kind.

Furthermore, from Table 4.9, the bank operating target for monetary policy, monetary base, was #1,668.5 billion (about 3.6%) beyond the indicative target of #1,604.8 billion for 2009. In the same year, broad money grew by 17.1% compared with 57.9% in 2008 while the target was 20.9% for 2009. The rise in the net domestic asset of the Central Bank such as the claims on the private sector as well as other items (net) to a great extent explains the rise in the base money sources. The growth in money supply was significantly motivated by the increase in the net domestic credit of the banking system. Narrow money grew by 2.4% in 2009 as against 56.1% growth in 2008. The domestic economy credit received as aggregates bank credit grew by 58.6% as against the growth of 84.2% in 2008. This substantially reflected the growth in credit to the private sector since the net credit to federal government fell by 25.9% as against the decrease of 31.2% in 2008. Therefore, the federal government became a net creditor to the banking system given its excess deposit with it, which was more than the credit obtained by it from the banking system. Finally, inflation also grew above the target of 9.0% by13.9% compared with 15.1% growth in the preceding year.

4.4 Balance of Payment Developments

The balance of payment statement in Nigeria has been characterized by an occasion deficit in some of its accounts. For example, the current account balance recorded deficit of #50 million or 0.9% of GDP in 1970 and there had been improvement in the balance in the succeeding year as it increased to 16.7% of GDP or #44.7 billion in 1990. The current account reflected the improvement in the good account as its surplus increased by #69.9 billion or 34% from 1970 to 1990. During the same period, the service and income account recorded deficit of #0.3 billion in 1970 which gradually increased to #29.0 billion in 1990. The net transfer increased to #3.6 billion in 1990 from #0.04 billion in 1970 though some negative were recorded in some years within the period, 1970-1990. In 1990, the capital account was in deficit of #49.2 billion as against it surplus of #0.04 billion in 1970. The pressure on the current account was largely attributable to high demand for import good overtime. However, the stabilization and structural adjustment measures carried out to lessen imports assisted in turning around the deficit to surplus in most of the years, 1970-1990.

Table 4.10 shows the development in Nigerian balance of payment profile. The constant pressures mounted on the external account often have significant effect on the overall balance of payments. For instance, a rise in the external reserves from US$1.4 billion in 1995 to US$9.9 billion and US$10.4 billion in 2000 and 2001, respectively reflected in the improvement of the overall balance of payment from the deficit position of 1.9% of GDP in 1995 to the surplus of #314.1 billion or 6.9 % of GDP and #24.7 billion or 0.5 % in 2000 and 2001, respectively. During the same period, the current account which was in deficit of 8.5% of GDP in 1995 also improved to the surplus of 8.5% and 4.5% of

GDP in 2000 and 2001, respectively while the capital and financial account recorded deficit for the three periods due to the capital reversal by the portfolio investors at these periods. In addition, aggregate external trade as reflected in the good account improved steadily from #247.2 billion in 1995 to #1059.2 billion in 2000 and declined to #767.0 billion in 2001. The decline might be attributable to the weak demand by the foreign trading counterparts. The services and income account for these periods showed no improvement as the deficit increased, while the net transfer largely increased by 221.4% in 2000, but later declined by 8.2% in 2001.

Table 4.10

Balance of payment statement in Nigeria

Indicators	1995	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
CAB as % GDP	-8.5	15.7	4.7	-1.5	7.0	17.6	32.8	25.3	16.8	13.7	7.9
Good Account	247.2	1059.2	767.0	382.8	1215.7	2615.7	3833.0	4495.9	4749.9	5438.8	3773.3
Services & Income Account	-484.8	-511.6	-676.1	-669.7	-711.3	-917.4	-930.4	-2087.6	-3605.0	-4406.0	-4598.4
Current Transfers	51.5	165.5	152.0	169.8	2001.2	358.0	1989.1	2289.7	2333.5	2295.4	2783.5
CFAB as % GDP	-1.7	-8.5	-4.5	-6.3	10.1	8.0	-16.8	-13.4	-6.6	-4.1	7.9
Overall balance % GDP	-1.9	6. 9	0.5	- 7.1	-1.6	9.6	10.0	9.6	5.5	0.8	-7.7
External reserves (US $ billion)	1.4	9.9	10.4	7.7	7.5	17.0	28.3	42.3	51.3	53.0	42.4

Source: Computed from the Central Bank of Nigeria Statistical Bulletin 2010 Note: CAB = Current account balance, CFAB = Capital & Financial Account Balance; USD 1.00 = #153.05 (# representing the Nigeria naira); Figures in Naira are in billions.

Nigeria external reserves declined from US$10.4 billion in 2001 to US$7.5 billion in 2003 and rose in the following year to US$17.0 billion. The development could be linked to the frantic efforts of the then federal government to improve Nigerian external reserves so as to rebuild confidence in foreign investors and attract foreign direct investment. The reflection of the decline in the external reserves in 2002 and 2003 was noticed in the overall balance of payment deficit of #563.5 and #162.3 billion in the respective years. However, an improvement in external reserves in 2004 also showed a surplus of 9.6% of GDP in 2004 in the overall balance of payment. For the three periods, the current account balance improved from its deficit of 1.5% of GDP to a surplus of 17.6% of GDP in 2004. Similarly, the capital and financial account performed well as the deficit in 2002 declined, and it recorded surplus of 10.1% and 8.0% of GDP in 2003 and 2004, respectively. The performance of this account could be due to the rise in the external reserves which to a certain extent built confidence in foreign portfolio investors to direct capital for investment in the economy. The good account significantly improved by 583.3% in 2004 compared with 2002. This could not be unconnected with the increase in the income from crude oil whice price had increased and hence, a substantial demand increase from Nigeria's trading foreign counterparts. Conversely, the services and income account deteriorated further with deficit increase in 2002 from #669.7 to #917.4 billion in 2004 while the net transfer increased from #169.8 billion in 2002 to #2001.2 billion in 2003 but declined in the following year to #358.0 billion.

The international reserves of Nigeria have continued to grow appreciably. For example, the stock of foreign reserves rose from US$28.3 billion in 2005 to US$42.3, US$51.3, and US$53.0 in 2006, 2007 and 2008, respectively. Notwithstanding, it fell by US$10.6 or 20% in 2009. According to CBN (2009), Nigerian imports of 17.7 months could be financed by this level of foreign reserves. The significant improvement in the foreign reserves growth for the past ten years was driven by some developments. First is the constant record of surpluses in the current account which tended to offset the continuous deficit recorded in the capital and financial account. For instance, the current account balance was in surplus from 2005 to 2009, although it declined gradually from 32.8% of GDP in 2005 to 7.9% in 2009 while capital and financial account on the other hand was in deficit for the whole periods except in 2009 when it recorded surplus of 7.9% of GDP. The second development is the favourable term of trade resulting from high prices of oil in the world oil market. This was noticeable in good account whose record improved from #3,833 billion from 2005 to #5,438.8 billion in 2008 and later declined by 30.6% to #3773.3 billion in 2009. The decline could be attributable to the effect of decrease in the total income from crude oil, gas and non-oil exports (gross export) and the moderate fall in imports. Third, is the fiscal discipline exercised in the public procurements which often followed due process; and finally, the strong and sound monetary policy embarked upon during the period.

The pressure relieved on the external account brought about overall balance of payment surplus of 10.0%, 9.5%, 5.5% and 0.8% of GDP from 2005 to 2008, respectively. By comparison, overall deficit of 7.7 % of GDP was recorded in 2009. This was reflected in the drawdown of foreign reserves in the same year. The services and income account was constantly in deficit throughout the period of analysis and stood at # 4598.4 in 2009. The constant deficit in this account was traceable to the reduction of investment in freight business by the Nigerians, failure to abide by the global shipping policies, the greater number of residents travelling abroad for education, and the rising volume of business abroad by the Nigerians. Finally, the current net transfer increased from #1,989.1 billion in 2005 to # 2333.5 billion in 2007 and increased by #488.1 billion in

2009 compared with 2008. The increased might be attributable to the depreciation of exchange rate in 2009.

4.5 Concluding Remarks

This chapter deals with the analysis of fiscal, monetary and balance of payment development in Nigeria from 1970 to 2009. The data analyzed provided evidence that Nigeria had a greater inflow of resources dominated by foreign one in the revenue realized during the period. Deficit financing was therefore considered to be the standard fiscal policy given the nature of the country's oil wealth. Therefore, finance of huge fiscal deficits is mostly carried out through the central bank credit. The increase in domestic credit brought about an increase in money supply with the consequence of inflation in the country. Also, borrowing as means of financing the external deficits contributed to the growth of money supply. Aas a result, there was expansion of imports demand which persistent pressure deteriorated the balance of payment. This suggests that unfavourable balance of payment in Nigeria is somehow attributable to the type of fiscal policy implemented.

CHAPTER FIVE

EMPIRICAL RESULTS AND ANALYSES

5.0 Introduction

This chapter is divided into four sections. In section 5.1, the results of the estimated structural model of government expenditure, equation 3.75 and government revenue, equation 3.76 are presented and analyzed in order to achieve the research objective 2 (To examine how the Nigerian government authorities adjust the desired level of alternative forms of nominal spending and income from taxes to a variation in the level of price, and how fast are such adjustments as shown in the actual spending adjustment decision).

Section 5.2 presents and analyzes the empirical results of the estimated real money supply equation 3.78 in order to achieve the research objective 3 (To investigate the role played by the fiscal deficits and domestic credits to private sectors in influencing the growth of money supply in Nigerian economy). In section 5.3, the results of bound test of co-integration and Granger causality tests among the variables in equation 3.93 and 3.79, respectively are presented and analyzed to achieve the research objective 4 (To examine the long and short run directions of causality between a pair of price level, real money supply, government fiscal deficit, interest rate and real output).

The last section 5.4 presents and analyzes the results of the four equations estimated under the monetary model of Exchange Market Pressure (equation 3.82, 3.83, 3.84 and 3.85) in order to achieve the research objective 5 (To determine the main means by which the exchange market pressure or external imbalance is absorbed by the monetary authorities in Nigeria). The equations are represented in their respective section of this chapter.

5.1 Estimated Results of Government Expenditure and Revenue

The government expenditure and revenue models as formulated by equation 3.75 and 3.76 are respectively represented as follows:

$$\ln GE_t = vg_0 + vg_1 \ln Y, + vg_2 EIF_t + vg_3 \ln(P/EIF)_t + (1\text{-}v)\ln(GE/P)_{t\text{-}} + \ln P_t \qquad 3.75$$

$$\ln TGR_t = rt_0 + rt_1 (\ln Y_t + \ln P_t) + rt_2 EIF_t + rt_3 \ln(P/EIF)_t + (1\text{-}r) \ln TGRt \qquad 3.76$$

The equations in their linear form are estimated by employing three stages least squares (3SLS). The method makes necessary correction for the possible cross-equation autocorrelation. In addition, the three-stage least squares (3SLS) estimates the whole equations at once as a system instead of estimating them one after the other (Korsu, 2009). In the process of estimation, the three stages least squares give the step three which permits non-zero covariance between the disturbance terms in the structural equations (Brooks, 2008). Test of autocorrelation such as Durbin Watson statistics or the h-test is not all that significant in simultaneous model (Aghevli & Khan, 1978). However, the autocorrelation test is conducted using Ljung-Box Q as reported in the result table. Also presented are tests of ARCH effect of heterosckedasticity and residual normality.

In Table 5.1, the results of the structural model in composite form given in panel 1 and 2 are presented. The estimated expenditure model (panel 1) has goodness of fit with the value of R-square indicating 0.91. This implies that 91% of government expenditure is explained by the real income Y, expected inflation EIF, price expectation given as ratio of actual price to expected inflation P/EIF and the one period lag of real government expenditure GE/P. The Ljung-Box Q shows that the residual of the model is free of serial correlation with p value of the Chi-square (0.8257) greater than 5%.

Table 5.1

Estimates of government expenditure and revenue models

Panel 1: Government Expenditure (Dependent variable: l_GE)

	coefficient	std. error	z	p-value
const	1.6191	2.9752	0.544	0.5863
l_Y	0.4987	0.1375	3.627	0.0003***
EIF	0.0306	0.0077	3.978	0.0000***
l_(P/EIF)	0.6994	0.0772	9.060	0.0000***
l_(GE/P)_1	0.7218	0.3303	2.186	0.0288**

Ljung-Box Q: χ^2 (1) = 0.0485 [0.8257]. R^2= 0.9153. Adj. R^2 = 0.9053

ARCH Effect: χ^2 (1) = 0.1954 [0.6584]. Doornik-Hansen: χ^2 (4) = 8.9574 [0.0622]

Panel 2: Government Revenue (Dependent variable: l_TGR)

	coefficient	std. error	z	p-value
const	2.1580	0.5169	4.175	0.0000***
(l_Y + l_P)	0.0340	0.0605	0.563	0.5736
EIF	0.0103	0.0040	2.607	0.0091***
l_(P/EIF)	0.1840	0.0563	3.268	0.0011***
l_TGR_1	0.7760	0.0781	9.940	0.0000***

Ljung-Box Q: χ^2 (1) = 0.9093 [0.3403] R^2 = 0.9861. Adj. R^2 = 0.9844

ARCH Effect: χ^2 (1) = 0.2092 [0.6474]. Doornik-Hansen: χ^2 (4) = 8.9574 [0.0622]

Note: All the variables are in natural log except the Expected inflation (EIF). ** and *** denote 5% and 1% level of significance respectively.

Test for ARCH of order 1 (with p-value of 0.658447) indicates no problem of heterosckedasticity. Also, Doornik-Hansen test of residual normality shows that the residual of the models is normally distributed (with p-value of 0.0622 greater than 5%). The results indicate that all the variables (real income Y, expected inflation EIF, price expectation given as ratio of actual price to expected inflation P/EIF, and the one period lag of real government expenditure GE/P) are correctly signed as proposed by the theory. Also, all the variables are significant at the 1% level except the one period lag of the real government expenditure which is significant at the 5% level. This means that increase in any of these variables will significantly increase the level of government expenditure. Income has positive effect on government expenditure and significant at the 1% level. This implies that government spending increases in relation to increase in real level of income. Both price expectation and expected inflation show significant positive sign implying that when there is rise in inflation, nominal government expenditure increasingly adjusts in response to it. From the foregoing results of government expenditure, since the real income Y, expected inflation EIF, price expectation P/EIF and the one period lag of the real government expenditure GE/P) are positively significant, it can be concluded that government increasingly adjusts its level of expenditure as the inflation and real income level increase.

Similarly, government revenue model (panel 2) estimated has its R-square value to be 0.98. This indicates that the model has goodness of fit and that about 98% of the government revenue is explained by real income, price expectation, and one period lag of the total government revenue. The model also exhibits absence of autocorrelation with the chi-square of the Ljung-Box Q indicating p-value of 0.3403 greater than 5%. Test for ARCH of order 1 (with p-value of 0.6474) indicates no problem of heterosckedasticity. Also, Doornik-Hansen test of residual normality shows that the residual of the models is normally distributed (with p-value of 0.0622 greater than 5%). The signs of the explanatory variables (real income, expected inflation, price expectation and one period lag of the total government revenue TGR) are correct as suggested by the models. However, the real income plays no significant role in influencing total government revenue when the country experiences inflation.

Results from (panel 2) also show that expected inflation, price expectation given as ratio of actual price to expected inflation, and one period lag of the total government revenue TGR are significant at the 1% level. Since these variables are positive and significant, any increase or decrease in any of the variables will respectively cause an increase or decrease in the level of government revenue. The expected inflation and price expectation indicate significant positive signs, meaning that government revenue or government income adjusts increasingly during the period of rise in expected inflation as well as when price expectation increases. In conclusion, since the expected inflation, price expectation and the one period lag of the total government revenue are positively significant in relation to government revenue, it implies that government tends to increasingly adjust its level of revenue during a period of rise in inflation, rise in price expectation and when its previous level of total revenue increases.

Table 5.2 reports the values of each parameter or adjustment coefficient in their separate form to determine how fast government adjustments are to rising inflation and real income level. The table also shows the average time lags for government expenditure and revenue. From the table, the coefficient of adjustment for government spending, v is 0.278 and that of government revenue, r is 0.224. The positive signs of these speeds of adjustments show that as the level of inflation increases, both expenditure and revenue of government adjust upward. Comparison of the values of the two adjustment variables v and r indicates that the value of the former is greater than the latter. This implies that the adjustment of government expenditure is faster than that of its revenue, usually associated with a phenomenon of weak system of tax collection (Aghevli & Khan, 1978; Heller, 1980). This has the consequence of high rate of inflation in the economy. In as much as the adjustment value v is more than r, the fiscal deficit in its nominal form is going to be a function of price level increase no matter whether "g" and "t" are equal to each other. The income elasticity in the long run for the government spending (g_1=1.795) is not quite different from unity, which implies that government expenditure will have a proportionate movement with the level of inflation. On the other hand, the value of the government revenue (t_1 =0.152) is not unitary. Thus, it does not exhibit proportionate movement with inflation.

Table 5.2
Estimated values of each parameter and the speeds of adjustments

Government Expenditure:					
Parameters	v	g_0	g_1	g_2	g_3
Parameter Values	0.278	5.823	1.795	0.112	2.514
Government Revenue:					
Parameters	r	t_0	t_1	t_2	t_3
Parameter Values	0.224	9.634	0.152	0.045	0.821
Average Time Lags (In years):					
Government Expenditure (1-v)/v	= 2.597				
Government Revenue (1-r)/r	= 3.464				

Source: Computed from the estimates in Table 5.1; See appendix A for the arithmetic

Table 5.2 also shows the average time lags (in years) in adjustment for government expenditure and revenue. The results indicate that the average time lag (2.597) in years in the adjustment of nominal government spending is shorter as compared to the average time lag (3.464) in years of nominal government revenue. The implication is that government expenditure quickly adjusts to meet up with the increase in the level of income and prices while nominal revenue collected from taxes lags behind in its adjustment. Consequent upon increase in government expenditure not meeting up with revenue is the increase in deficits experienced in the economy. As far as the nominal revenue continues to lag behind relative to government expenditure, there will always be continuous increase in deficits. This results support the finding obtained by Aghevli and Khan (1978) for four developing countries, Heller (1980) for 13 developing countries, and Kilindo (1997) for the period before economic reform in Tanzania.

5.2 Empirical Results of the Estimated Real Money Supply Model

In order to achieve the research objective 3, the real money supply equation 3.78 is represented below. The equation is estimated to investigate the role played by the fiscal deficit and the domestic credits to private sectors among other factors in influencing the growth of money supply in Nigeria.

$$lnMS_t = \alpha_0 + \alpha_1 GFD_t + \alpha_2 lnDCP_t + \alpha_3 lnIR + \alpha_4 lnP_t + Ut \qquad 3.78$$

All the variables are in natural logarithm except the government fiscal deficit. The government fiscal deficit is not logged because almost all the values for the variable are in negative form, the logarithm of which will yield zero. Prior to the estimation, the properties of the time series data of the variables are tested for the unit roots to ascertain their level of stationarity. Dickey Fuller (DF) and Augmented Dickey Fuller (ADF) statistics are employed for testing the unit roots.

Table 5.3

Results of the unit roots tests (ADF statistics) in levels

Variable	Model Types	ADF Statistics	P-value	Lags	AIC
l_MS	Constant	0.0941	0.9613	0	1593.87
	Constant/trends	-1.0692	0.9218	0	1593.05
GFD	Constant	2.6829	0.0919	8	861.76
	Constant/trends	2.0189	0.0605	8	858.666
l_DCP	Constant	-0.0435	0.9486	0	32.4762
	Constant/trends	-3.0717	0.1268	0	25.2063
l_IR	Constant	-1.3128	0.6259	1	-12.5441
	Constant/trends	-1.2551	0.8981	1	-10.9755
l_P	Constant	-0.7502	0.8221	0	-27.565
	Constant/trends	-1.5630	0.7898	0	-27.8524

Note: All the variables are in natural log except GFD.

Table 5.4

Results of the unit roots tests in first differences

Variable	Model Types	ADF Statistics	P-value	Lags	AIC
l_MS	Constant	-5.9722	0.0000	0	1680.36
	Constant/trends	-5.9732	0.0001	0	1591.43
GFD	Constant	-5.06883	0.0000	5	917.328
	Constant/trends	-6.17314	0.0000	5	911.068
l_DCP	Constant	-7.7657	0.0000	0	29.7371
	Constant/trends	-7.7302	0.0000	0	31.1915
l_IR	Constant	-8.93944	0.0000	0	-12.7204
	Constant/trends	-8.9061	0.0000	0	-11.2586
l_P	Constant	-6.12422	0.0000	0	-26.1602
	Constant/trends	-6.14587	0.0000	0	-24.9058

Note: All the variables are in natural log except GFD.

The tests are also important to determine the variables' order of integration before modelling the real money supply (Brooks, 2008). Table 5.3 indicates that all the variables (real money supply, MS; government fiscal deficit, GFD; domestic credit to private sectors, DCP; interest rate, IR; and price level, P) are non stationary at level with the p-values for each of the variable tested at level greater than the 1%, 5% and 10% level of significance. For this reason, the null hypothesis that the individual variable has a unit root is accepted. Having confirmed that the variables are not stationary at levels and that there is presence of a unit root, each variable is subjected to first differences and tested using DF and ADF. The results of the tests (Table 5.4) show that when the variables are differenced once, they become stationary, thus rejecting the null hypothesis that they have unit roots. The p-value for each variable is lesser than the 1%, 5% and 10% level of significance, which implies that all the variables are integrated of order one, or I(1).

5.2.1 Optimal lag selection procedure

Johansen co-integration test and Vector Error Correction Model (VECM) are sensitive to the number of optimal lags that must be used (Asteriou & Hall, 2007; Brooks, 2008; Sarbapriya & Ishita, 2011). Therefore, a simple VAR is run and a VAR system maximum lag order 5 is reported in Table 5.5 with the optimal lag, based on either of the criteria. From the table, the SBIC indicates that the optimal lag should be 1 while both HQC and AIC indicate optimal lag 5. The Loglik and LR did not make any indication of the optimal lag to be chosen for the estimation. For the purpose of goodness of fit, Khim and Liew (2004) suggests that if the observations are lower than 60, AIC or Final prediction error (FPE) is more superior compared to other criteria and should be used while the HQC should be used if the observations exceed 60. Since the number of observations in this study is less than 60, the optimal lag used is 5, based on the AIC criterion. In addition, both AIC and HQC insist on lag 5 as the optimal lag for this model.

Table 5.5
VAR lag order selection criteria

Lags	Loglik	p(LR)	AIC	SBIC	HQC
1	-413.98615		24.665897	25.985496*	25.126472
2	-390.43500	0.00477	24.746389	27.165654	25.590777
3	-368.24650	0.00984	24.902583	28.421514	26.130785
4	-338.28851	0.00011	24.627139	29.245736	26.239153
5	-280.08534	0.00000	22.782519*	28.500782	24.778346*

Note: The appropriate lag order chosen by each criterion is indicated by the asterisks. LR stands for sequential modified LR test statistic, Akaike criterion is represented by AIC, and SBIC stands for Schwarz Bayesian criterion. Hannan-Quinn criterion and Log likelihood are respectively represented by HQC and Loglik, while the NA stands for not available.

5.2.2 Estimation of Johansen co-integration test

Cottrell (2011) employs Monte Carlo simulation to support the hypothesis that the critical values with respect to Johansen's case 3 (unrestricted constant) provide appropriate sized test on condition that the model specified is correct. Accordingly, Johansen's case 3 should be chosen in a case where the data do not show a quadratic but linear trend and where the variables in their levels show a trend with its value unrestricted. This brings about a linear trend in exogenous variable because the exogenous variable is in difference. Therefore, Johansen's case 3 (unrestricted constant) has been postulated since almost all the variables used display trends with the appearance of linearity rather than quadratic.

Table 5.6
Johansen co-integration tests (Trace test or λ max tests)

Johansen test:
Number of equations = 5
Lag order = 5
Estimation period: 1975 - 2010 (T = 36)
Case 3: Unrestricted constant

Log-likelihood = -177.922 (including constant term: -280.085)

Rank	Eigenvalue	Trace test	p-value	Lmax test	p-value
0	0.85443	146.36***	[0.0000]	69.374***	[0.0000]
1	0.72533	76.984***	[0.0000]	46.519***	[0.0000]
2	0.46686	30.465**	[0.0416]	22.643**	[0.0282]
3	0.18738	7.8220	[0.4918]	7.4699	[0.4440]
4	0.00973	0.3522	[0.5529]	0.3522	[0.5529]

Corrected for sample size (df = 10)

Rank	Trace test	p-value
0	146.36	[0.0034]
1	76.984	[0.0218]
2	30.465	[0.2196]
3	7.8220	[0.6022]
4	0.3522	[0.6020]

eigenvalue	0.85443	0.72533	0.46686	0.18738	0.0097348

Note: **, *** show rejection of Null hypothesis at 5% and 1% significance level respectively

Johansen co-integration test is conducted using 5 lags on the basis of the likelihood ratio test adjustment for degree of freedom, and AIC to determine whether the variables (real money supply, government deficit, domestic credit to private, interest rate, and the price level) are co-integrated. With co-integration analysis, one will be clarified about the relationships existing between integrated variables in the long run. Under this method, the most commonly used in the determination of the number of co-integration in a system is Johansen trace test or maximum eigenvalues (λ Max) test. The "λ Max" test is for the hypothesis on each eigenvalues, while the "trace" test is for the join hypotheses. The results of the co-integration test are reported in Table 5.6.

The number of rank π gives how many co-integrating vectors that can be found in a system and the number of positive eigenvalues found to be significant decides the rank. The null hypothesis for the trace test, H_0 states that there exists at most π positive eigenvalues in contrast to the alternative hypothesis H_1 which states that there exists more than π positive eigenvalues. On the other hand, the null hypothesis for the maximum eigenvalues (λ Max) test, H_0 states that the number of co-integrating vector or positive eigenvalues present does not exceed π in contrast to the alternative hypothesis H_1 which states that the number of co-integrating vectors or positive eigenvalues is more than π. The tests are conducted in series starting with $\pi = 0$ until the null hypothesis is accepted for the first time. The null hypothesis is not accepted in a case where the test statistics values are very large.

From Table 5.6, the two tests reject the null hypothesis that the rank π is 0 with the p-values of 0.0000 for each of them. Trace and λ Max tests also show that the null hypothesis that the rank π is 1 is rejected with the former and latter having the p-values of 0.0000 each. For the hypothesis that the rank π equals 2, the trace test rejects it at the 5% level of significance while the λ Max test also rejects it at the 5% level of significance. Therefore, the two Johansen tests (Trace and Lmax) indicate that there are three co-integration equations in the analysis.

5.2.3 Estimation of vector error correction model

The model employing the Johansen approach is the Vector Error Correction Model (VECM) or what is known as error correction model. The use of VECM is necessitated to identify and test whether the structural coefficients describing the theoretical associations are significantly different from zero or not (Rao, 2005). Therefore, the estimation of VECM is done with the use of 5 lags to establish the short run dynamics (ECM). The results of VECM obtained provide the long run relationships with its associated test of significances of each parameter estimate in Table 5.7.

Table 5.7
Results of vector error correction model

VECM system, lag order 5
Maximum likelihood estimates, observations 1975-2010 (T = 36)
Cointegration rank = 1
Case 3: Unrestricted constant

beta (cointegrating vectors, standard errors in parentheses)

l_MS	1.0000
	(0.0000)
GFD	5.40e-007
	(2.09e-007)
l_DCP	-0.2949
	(0.0545)
l_IR	1.4604
	(0.1048)
l_P	-0.2762
	(0.0535)

Note: All the variables are in natural log except GFD.

The long run co-integration vectors resulting from VECM estimation in Table 5.7 are normalized on real money supply l_MS by setting the coefficient of l_MS estimated at minus unity to comply with the common practice (Anornuo, 2002; Bahmani-Oskooee &

Shabsigh, 1996). This makes the vectors to reflect the idea that they are money supply model. The equation indicates standard error in brackets and the sign of the coefficient for each parameter is reversed in opposite to the co-integrating vectors in Table 5.7. This is to comply with the mathematical property belonging to the theoretical error correction mechanism in which normalization of coefficients which are non-zero on dependent variable (MS) equals one (Georgieva, 2012). Therefore, in order to determine their long run effects, government deficit GFD, domestic credit to private sector DCP, interest rate IR, and price level P are normalized on the real money supply MS as in equation 5.1.

$$\underset{}{lnMS_t} = \underset{(0.0000002)}{-\,0.0000005\,GFD_t} + \underset{(0.0545)}{0.295\,lnDCP_t} - \underset{(0.1048)}{1.460\,lnIR} + \underset{(0.0535)}{0.276\,lnP_t} \qquad 5.1$$

The fiscal policy of government results in fiscal deficits as its expenditure exceeds its revenue probably due to the level of inflation which could have stimulated increase in government spending. In Nigerian economy, such deficits are often financed by using bank credits. The credit creation by banks particularly, the Central Bank provides a link between government fiscal and monetary policies. This is because deficits are correspondingly linked to increase in the money supply due to the credit creation by the Central Banks. The variations in money demand and/or changes in the money supply are therefore brought about by growth of various Nigerian economic variables like interest rate and Central Bank credit among other variables. The extension of credit to both private sectors and government influences the monetary base of the central bank. The change in monetary base or high powered money gives rise to more money supply.

Theoretically and in line with the liquidity effect view, money demand is a decreasing function of nominal rate of interest and for the money market to be in equilibrium, the money supply must rise to bring about a decrease in interest rate. Thus, a negative relationship is expected between the interest rate and money supply. However, the implication of Fisher equation in economic theory suggests that money supply is positively related with interest rates. In the equation, the nominal interest rate equalized the summation of the real rate of interest with the expected inflation rate. Due to the expectation of the public that monetary policy expansion will result in inflation, any rise in the supply of money could lead to expected inflation which in turn raises nominal rate of interest (Monnet & Weber, 2001).

As can be observed from the co-integration equation 5.4 in which the coefficient of real money supply (MS) is normalized, all the independent variables are significant in explaining the variations in endogenous variable. Foe example, the coefficient sign of fiscal deficit is negative against the popular proposition but significant in influencing the growth of money supply in the long run. This result is paralleled to the results obtained by some studies such as Giannaros and Kolluri (1985) in the study of 10 industrialized countries, Loungani and Swagel (2001) in the study of 53 developing countries. These previous studies reported negative relationship between fiscal deficit and money supply. Plausible reasons have been given for such relationships. The negative association of money with the government fiscal deficit could be explained on the basis of stabilization objectives. For example if the previous deficit is thought by the monetary authorities to cause inflation, they may decrease the money supply (Giannaros & Kolluri, 1985). In addition, the negative association of money with the government fiscal deficit could be explained on the basis of capital-inflow hypothesis. Fiscal deficits increase is thought to raise interest rate, thereby reducing capital formation and the level of output or income (Loungani & Swagel, 2001). However, an increase in interest rate rate leads to capital inflow and thereby dampens the relationship between deficits and interest rate (Flemming 1962; Mundell, 1963). As a consequence, there is a possibility of reduction in money growth following an initial increase in the deficits.

The domestic credit to private sectors has the right sign as expected and thus exhibits significant positive influence on the supply of real money supply in the long run. This implies that an increase in the growth of credit to private sectors causes an increase in the growth of real money supply in the long run. Korsu (2009) finds similar result with respect to the effect of domestic credit to private sector on money supply in the study of external sectors of Sierra Leone.

The interest rate is negatively signed and significant in affecting the growth of money supply. This suggests that an increase in interest rate tends to lower the real money supply. The negative relationship between money supply and interest rate supports the liquidity effect view in economic theory which implies that to raise interest rate there must be reduction in the money supply. These results support the previous results obtained in the past related studies by Ezeabasilli and Mojekwu (2011) for Nigeria, and Funke (2001) for Euroland. Another important variable that has the expected sign, and is significantly different from zero is the price. The coefficient of price is positive and significant, thus contributing to the growth of real money supply in the long run. This implies that when the level of inflation increases the level of real money supply becomes higher. The significant positive impact of price on money supply has previously been reported in some studies (See for example, Aghevli & Khan, 1977; Akhtar, 2005; Dulton, 1971; Frenkel & Johnson, 1977; Hoover, 1991; Sergent & Wallace 1973). These studies assert that inflation causes money supply through its influence on government deficit. On the whole, the results reveal that the observed growth in the real money supply in Nigeria is fundamentally determined by the government deficit, domestic credit to private sector, interest rate, and the price level in the long run.

5.2.4 Vector error correction model: short run dynamics

For policy analysis and for the assessment of the behavioural relationships among variables, it is quite relevant to empirically examine the short run dynamics. An error correction model was therefore employed to study the short run changes in real money supply in response to change in government deficit, domestic credit to private sector, interest rate and price level. The result of such estimation is shown in Table 5.8. From the results, error correction term turns out to be negative and significantly different from zero at the 1% level with p-value equals to 0.0018. The estimated value of error correction term for this model is 0.71 representing the misalignment in the short run that will cause the real money supply (MS) to restore its long run equilibrium. This implies an approximate feedback of 71% of the disequilibrium in the past year.

The coefficient of the error correction term indicates the speed of adjustment to equilibrium. In this case, it corrects the previous disequilibrium at the speed of 71% annually. With the error term being significant and negative, it further buttresses the earlier conclusion of the presence of co-integration. In theory, it will be meaningful for the error correction term to have negative coefficient in the range of 0, 1 and not greater than 2. It positivity will imply an explosive system and hence become unreasonable (Georgieva, 2012).

Table 5.8

Results of error correction model

Equation 1: d_l_MS

	Coefficients	std. error	t-ratio	p-value
const	6.0595	1.5627	3.878	0.0017***
d_l_MS_1	0.7703	0.1871	4.116	0.0010***
d_l_MS_2	-0.1528	0.2184	-0.699	0.4958
d_l_MS_3	-0.1521	0.2297	-0.662	0.5185
d_l_MS_4	-0.0951	0.2008	-0.474	0.6430
d_GFD_1	2.88e-07	2.23e-07	1.290	0.2178
d_GFD_2	7.37e-07	2.76e-07	2.667	0.0184**
d_GFD_3	-2.55e-07	1.92e-07	-1.330	0.2047
d_GFD_4	2.36e-08	2.14e-07	0.110	0.9139
d_l_DCP_1	0.0557	0.0610	0.913	0.3768
d_l_DCP_2	-0.0036	0.0702	-0.051	0.9603
d_l_DCP_3	0.0070	0.0654	0.107	0.9161
d_l_DCP_4	0.1319	0.0653	2.019	0.0630*
d_l_IR_1	0.7776	0.2432	3.197	0.0065***
d_l_IR_2	-0.1064	0.2166	-0.491	0.6308
d_l_IR_3	0.4827	0.1714	2.816	0.0137**
d_l_IR_4	0.1287	0.1556	0.827	0.4220
d_l_P_1	0.0985	0.1605	0.614	0.5491
d_l_P_2	-0.1112	0.1776	-0.626	0.5414
d_l_P_3	-0.0321	0.2149	-0.149	0.8834
d_l_P_4	-0.4773	0.2083	-2.291	0.0380**
EC1	-0.7060	0.1831	-3.855	0.0018***

Mean dependent var	0.070972	S.D. dependent var	0.180825
Sum squared resid	0.094964	S.E. of regression	0.082360
R-squared	0.917020	Adjusted R-squared	0.792550
rho	-0.139986	Durbin-Watson	2.241704

Note: *, **, *** indicate 10%, 5% and 1% level of significance. All the variables are in natural log except GFD.

From Table 5.8, the results of the error correction model estimated (short run dynamics), all the explanatory variables play significant role in determining the real money supply in the short run. For example, the real money supply serves as exogenous variable with its coefficient of one period lags being positive. It has its p-value equals to 0.0010 and is therefore significant at the 1% level. This means that an increase in one period lagged of the real supply of money causes an increase in the current real supply of money. The two period lag of government deficit exerts positive influence on real money supply at the 5% level of significance. This suggests that the real supply of money is caused to increase as the total deficit of government grows. Similar studies using Nigerian data that have reported the significant positive impact of fiscal deficit on money supply include Adam and Bankole (2000), Chimobi and Igwe (2010), Ndebbio (1988), Onwioduokit (1999), and Oyedeji (1972). Domestic credit to private sectors has positive influence on real money supply. Its four period lag is positively signed with p-value of 0.0630, thus making it to be significant at the 10% level. This suggests that domestic credit to private sectors contributes to the growth of the real money supply. This result is paralleled to the finding of Korsu (2009) who reported positive significant impact of domestic credit to private on money supply using Sierra Leone data.

Furthermore, the influence of four period lag of price level on real money supply is negative and significant at the 5% level with the p-value equals to 0.0380. This implies that the higher the price level the lower will be the supply of real money. This is because equilibrium in the money market occurs when the demand for real money balances is just equal to the real money supply. It is the nominal money supply and not the real money supply that can be exogenously fixed by the monetary authority. Any change in the price level will affect the real money supply. Given that the nominal money supply is fixed, an increase in price level shifts the LM schedule to the left. Therefore, the effect of a higher price level reduces the real money supply (see Froyen, 2013; p 168)

In support of the Fisher equation perspective in economic theory, the one period lagged and the three periods lagged value of the interest rate are found to be positively signed and significant at the 1% and 5% level with p-value equals to 0.0065 and 0.0137, respectively. These results support those obtained by Monnet and Weber (2001), and Alatiqi and Fazel (2008) in their previous studies. They find support for Fisher equation perspective that money supply and interest rate have positive relationship. This is against the liquidity effect view of Keynesian economic theory which argues for negative relationship between money supply and interest rates.

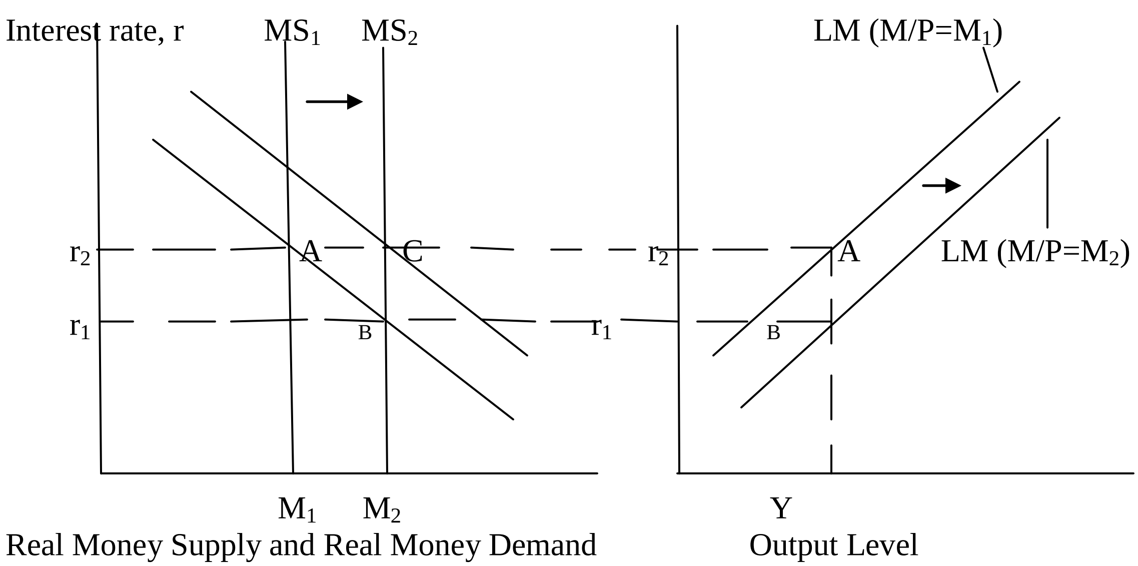

Figure 5.1
Shifts in real money supply and real money demand

Plausible reasons could be given for the positive association of the nominal interest rate and money supply. For example, suppose that the money demand curve does not shift, an outward shift in the money supply curve pushes the demand to move downward along its curve thereby making the equilibrium rate of interest to fall. If both curves for money supply and money demand shift at the same time, the new equilibrium level of the rate of interest could be equal or more than the previous equilibrium level. Figure 5.1 illustrates the graphical analysis.

Secondly, in the period of stagflation in the economy, hike in real output and price level could likely make money demand to shift outward. For instance, at the period of stagflation, increasing prices could likely increase the demand for money by the households and as a result, money demand curve shifts outward. Under this situation, if the monetary authorities embark on monetary policy expansion, there could be a rise in or no variation in interest rates (Alatiqi & Fazel, 2008). See Figure 5.2

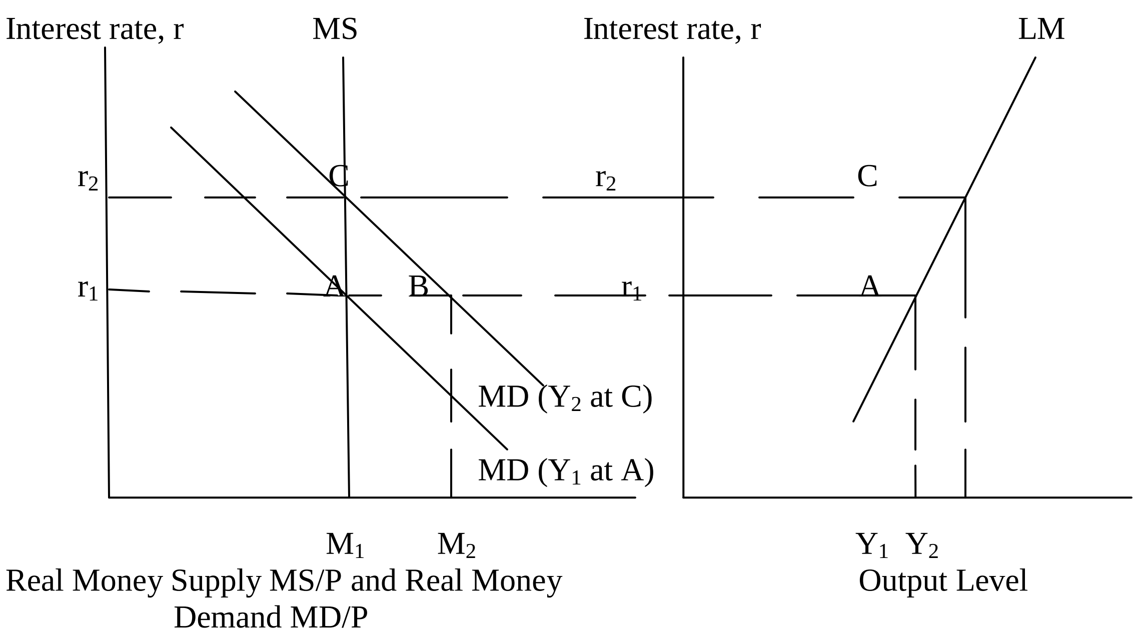

Figure 5.2
Income and Price effect of shift in money demand

Thirdly, it is possible as shown in Figure 5.2 that interest rates and money supply never move in opposite direction considering the influence of real output and price. Consequence upon monetary policy expansion, real output and the level of price could increase thereby causing an outward shift in demand for money and hence, the interest rates is caused to increase (Alatiqi & Fazel, 2008).

Finally, the implication of Fisher equation suggests that money supply is positively related to interest rates. In the equation, the nominal interest rate equalized the summation of the real rate of interest with the expected inflation rate. Due to the expectation of the public that monetary policy expansion will result in inflation, any rise in the supply of money could lead to expected inflation which in turn raises nominal rate of interest. In a nutshell, an increase in money supply might not cause a reduction in the interest rates (Monnet & Weber, 2001).

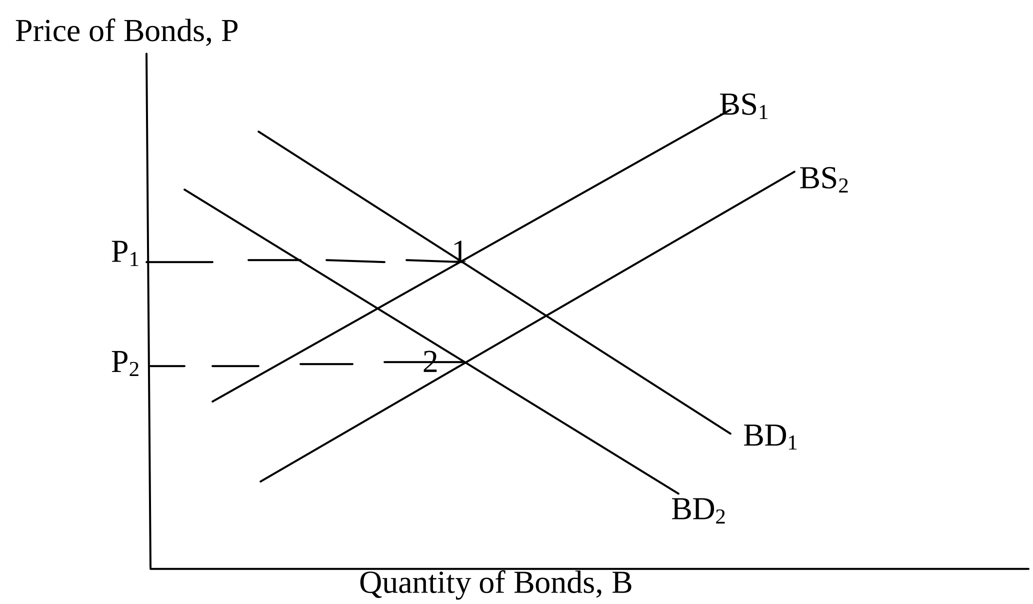

Figure 5.3
Fisher effect of expected inflation

In Figure 5.3, when expected inflation rises with a rise in money supply, the supply curve for bonds shifts from BS_1 to BS_2 and the demand curve shifts from BD_1 to BD_2. The equilibrium point moves from point 1 to point 2, and this leads to a fall in the equilibrium price of bonds from P_1 to P_2. Consequently, in Fisher effect, the equilibrium level of interest rate rises.

5.2.5 Diagnostic test on VECM's residual

In order to check how valid the specification with respect to vector error correction is, some diagnostic tests are conducted for the analysis of the VECM's residual. To conduct the test of autocorrelation and normality, the study employs the procedure of a unit root (Brooks, 2002).

Table 5.9
Results of test on VECM's residual

Test types	P-values				
	eqtn1	eqtn2	eqtn3	eqtn4	eqtn5
LM (Autocorrelation)					
Breusch-Godfrey:	0.418	0.93	0.665	0.725	0.997
Heteroscedasticity					
(ARCH Effect):	0.113	0.253	0.888	0.559	0.686
Normality					
Jarque-Bera:	0.176	0.642	0.840	0.155	0.763
	Descriptive Statistics				
	eqtn1	eqtn2	eqtn3	eqtn4	eqtn5
Skewness	-0.6808	-0.1390	-0.0814	0.4244	-0.1911
Kurtosis	0.6776	-0.7171	-0.4533	1.3283	-0.4635

Table 5.9 reports the results of such tests conducted on each of the equations residual. According to the results, Breusch-Godfrey test of autocorrelation of order 10 yields P($\chi 2$ (10) > 10.2612) = 0.418, P($\chi 2$ (10) > 4.34704) = 0.93, P($\chi 2$ (10) > 7.62479) = 0.665, P($\chi 2$ (10) > 7.00785) = 0.725, P($\chi 2$ (10) > 1.92149) = 0.997 for the respective 5 equations. Since the p-value for each of these equations is greater than the 5% level of significance, the null hypothesis of no serial correlation cannot be rejected. The test for heteroscedasticity of order 10 gives p-value = P(χ^2 (10) > 15.5725) = 0.1125, P(χ^2 (10) > 12.4978) = 0.2531, P(χ^2 (10) > 5.04961) = 0.8878, P(χ^2 (10) > 8.71683) = 0.5592, P(χ^2 (10) > 7.4141) = 0.6859 for the individual 5 equations, respectively. It can be observed that all the p-value for the individual 5 equations is more than the 5% level of significance, and for this reason, the null hypothesis of absence of ARCH effect is accepted.

Jarque-Bera test with respect to residual normality of each equation 1 to 5 shows the value of test statistics equal to 3.46963, with p-value 0.1764; 0.887309, with p-value 0.6417; 0.347963, with p-value 0.8403; 3.72745, with p-value 0.1551, and 0.541421, with p-value 0.7628. With these indications, all the p-values are greater than the 5 percent level of significance. This confirms that each equation's residual is normally distributed. Furthermore, Dornik-Hansen test with respect to multivariate normality accepts the null hypothesis that the combined residual is normally distributed with Chi-square (10) = 6.20148 [0.7981].

Normality is also evaluated to certain degree by getting the values of Skewness and Kurtosis. The value of skewness indicates the equality or similarity of distribution while that of Kurtosis gives information regarding the ‘peakedness’ of the distribution. A positive value of skewness shows the clustering of scores at the low values to the left hand side of the graph while its negative value shows scores at the high values that clustered to the right of the graph. Positive values of kurtosis show that the distribution is somewhat peaked and clustering at the centre of the graph. In this case, the graph has a thin tails which is long. For a perfectly normal distribution, the values of skewness and kurtosis yield 0. When a kurtosis has it values below 0, the distribution chat becomes flat relatively (Pallant, 2011).

From Table 5.9, the value of skewness is found to be negative (-0.681) for equation 1 which indicates that the scores are clustered at the high end, to the right of the graph. The value of the kurtosis (0.678) for the equation 1 indicates positive sign implying that the distribution demonstrates to be peaked, clustered at the centre and has long thin tails. Furthermore, the value of skewness turns out to be negative (-0.139), (-0.081) and (-0191) for the equation 2, 3 and 5, respectively. These indicate that the scores are clustered at the high end, to the right of the graph.

The respective values of kurtosis for equation 2, 3 and 5 are also negative (-0.717), (-0.453) and (-0.464) which indicates that they have relative flat distribution. The respective value of skewness is found to be positive (0.424) for equation 4 implying that the scores cluster to the left hand side of the graph at low values. The value of the kurtosis (1.328) for the equation 4 indicates positive sign, implying that the distributions demonstrates to be peaked, clustered at the centre and has long thin tails.

In summary, the results of the descriptive statistics given in Table 5.9 for each equation's residual demonstrate normal distribution. In addition, Figure 5.4 indicates the VECM residual's plots for each of the series (or each of the equation). The standardized residual plots appear to be stationary and have thin tails.

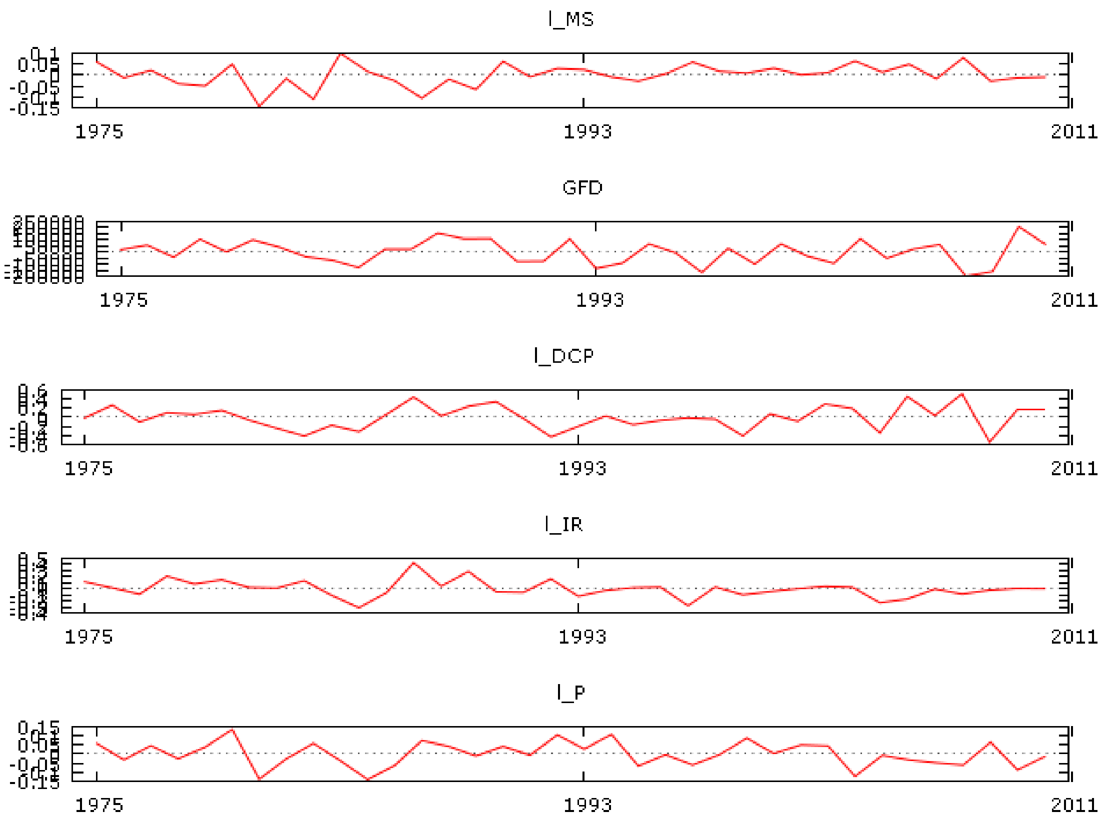

Figure 5.4
VECM residual's plots

5.2.6 Variance decomposition

The Choleski's variance decomposition is computed from VECM. Lutkepohl (1991) noted that the outcomes of the forecast error variance decomposition from the Choleski's decomposition have strong sensitivity to the ordering and length of lag. In view of this, Lee, Pesaran, and Pierse (1992) suggest generalized variance decomposition in overcoming the shortcoming associated with Choleski's decomposition. This study, therefore, employs the application of generalized variance decomposition in which case the percentage is used to represent innovation in explanatory variables and variables' strength to their own shocks.

Variance decomposition is a useful tool for assessing the dynamic interactions and how strong is the causal relationship from one variable to another within the system (Duasa, 2007). Variance decomposition helps to examine the impacts of shocks to the endogenous variable. It decides within the system the amount of forecast error variance for any particular variable that is explained by innovations to individual exogenous variable over a time period. In most cases, own variable shocks provide a larger percentage explanation of the error variance compared with other variables in the system. The important roles of government fiscal deficit (GFD), domestic credit to private sectors (DCP), interest rate (IR), and price level (P) in the variation of Nigerian real money supply are justified by the results of variance decomposition in Table 5.10. The results of variance decomposition show that from year 1 horizon to year 5, each variable explanatory power is strengthened to an estimate of 7.6%, 14.4%, 12.4% and 3.4%. These percentages account for the Nigerian forecast error variance connected to the changes in the government fiscal deficit, domestic credit to private sectors, interest rate and price level, respectively. The percentage of real money supply forecast variance explained by innovation in domestic credit to private sectors is the highest (14.4%) while that of price level is the lowest (3.4%) at this period relative to others.

Table 5.10
Results of variance decompositions

Horizon	% of forecast variance of ΔMS resulting from innovations in				
	ΔMS	ΔGFD	ΔDCP	ΔIR	ΔP
1	100.0000	0.0000	0.0000	0.0000	0.0000
3	62.1617	0.4306	14.5300	21.5981	1.2795
5	62.1881	7.6383	14.4131	12.3610	3.3996
10	68.3464	2.7060	12.4347	8.9981	7.5149
15	69.1235	2.0588	15.2167	6.0507	7.5504
	% of forecast variance of ΔGFD resulting from innovations in				
	ΔMS	ΔGFD	ΔDCP	ΔIR	ΔP
1	10.6038	89.3962	0.0000	0.0000	0.0000
3	23.2037	44.4753	16.7886	13.8590	1.6734
5	17.3437	26.5787	20.2107	31.8941	3.9729
10	23.1928	29.1807	19.1761	25.5776	2.8728
15	23.5866	23.1909	20.0395	29.9704	3.2126
	% of forecast variance of ΔDCP resulting from innovations in				
	ΔMS	ΔGFD	ΔDCP	ΔIR	ΔP
1	1.2981	10.5901	88.1118	0.0000	0.0000
3	0.7549	10.9758	76.8297	10.4886	0.9510
5	0.8397	21.6923	68.2803	8.5519	0.6357
10	3.5621	16.2367	72.4970	7.0773	0.6268
15	5.5343	16.4204	69.2235	7.6725	1.1492
	% of forecast variance of ΔIR resulting from innovations in				
	ΔMS	ΔGFD	ΔDCP	ΔIR	ΔP
1	24.7958	16.8371	3.6405	54.7266	0.0000
3	45.8195	10.3129	2.9841	38.9698	1.9137
5	57.3112	9.0845	1.5976	25.0687	6.9380
10	66.6311	5.9702	2.4026	15.9129	9.0832
15	69.1258	5.2676	2.6943	13.8772	9.0351
	% of forecast variance of ΔP resulting from innovations in				
	ΔMS	ΔGFD	ΔDCP	ΔIR	ΔP
1	0.0803	2.0398	1.3057	42.0264	54.5478
3	0.1610	1.0980	6.5488	74.9440	17.2481
5	0.9239	9.2331	6.0028	68.7502	15.0900
10	19.7725	6.1473	5.3052	62.3772	6.3978
15	25.0216	5.1419	7.4723	57.5272	4.8369

As the horizon becomes longer, the percentage of money supply changes explained by the exogenous variables continues to increase. At the end of the longer period, the 15-year horizon, about 30 percent of the forecast error variance in real money supply is explainable by the innovation in GFD (2%), DCP (15%), IR (6%) and P (8%). This gives the strong running of causality from DCP to MS. By considering the own shock along the diagonal, the domestic credit to private sector (DCP) appears to have large own shock of 69.2%. This shows that DCP is the most exogenous variable within the system with the rest explanatory variables only provide explanation of about 30.8% of its forecast variance. Furthermore, it could be observed that the percentage of variance explanation by own shock for P is just 4.8% relative to others. This proves that its shock received is rooted from other macroeconomics variances within the system. Therefore, the estimates indicate that in the system, P is the most dependent (endogenous) variable.

5.3 Results of ARDL Bound Test and Granger Causality Test

The main purpose in this section is to investigate the long and short run Granger causality between a pair of price level, real money supply, government fiscal deficit, interest rate and real output in order to achieve the research objective 4. Therefore, the unrestricted error correction model (equation 3.93) is used to test for the co-integration among the variables where each variable takes turn to serve as dependent variable for the test. From the equation 3.93, Δ is the first difference operator, ln is the natural logarithm, K is the optimum lag, P is the price level, MS is the real money supply, GFD is the government fiscal deficit, IR is the interest rate, RY is the real gross domestic product (real output), and U is the error term. All the variables are in natural logarithm form with the exception of the government fiscal deficit. The government fiscal deficit is not in natural logarithm because almost all its values are in negative form.

$$\Delta lnP_t = \gamma_0 + \sum_{i=1}^{k} \gamma_1 \Delta lnP_{t-i} + \sum_{i=0}^{k} \gamma_2 \Delta lnMS_{t-i} + \sum_{i=0}^{k} \gamma_3 \Delta GFD_{t-i} + \sum_{i=0}^{k} \gamma_4 \Delta lnIR_{t-i} + \sum_{i=0}^{k} \gamma_5 \Delta lnRY_{t-i}$$
$$+ \alpha_1 lnP_{t-1} + \alpha_2 lnMS_{t-1} + \alpha_3 GFD_{t-1} + \alpha_4 lnIR_{t-1} + \alpha_5 lnRY_{t-1} + U_t \qquad 3.93$$

As a first step of the procedure, the properties of the variables are required to be examined to ensure that the dependent variable (price level) is integrated of order one or I(1) and the independent variables are either integrated of order one, I(1) or integrated of order zero, I(0). The requirements which if not met make the adoption of ARDL invalid (Perasan et al., 2001). Besides, all the variables must be integrated of order one for the implementation of Granger causality tests in spite of the advantage that bound test for co-integration can be applicable not withstanding the order of integration of the variables (Narayan & Smyth, 2005). In order to verify the preconditions, unit root tests are conducted on each variable. Two methods of unit root test adopted are the ADF test and Phillip Perron (PP) test. The estimation of PP statistics makes use of Bartlett kernel with Newey-West Bandwidth. The two tests ensure robustness of the results. In particular, PP test corrects for higher order autocorrelation in the series and also deals with the likely problem of heteroscedasticity (Kouakou, 2011). The lags used for the estimations under the two methods are automatically selected. The results of the tests on the variables at levels and first differences are displayed in Tables 5.11 and 5.12, respectively.

Table 5.11

Unit roots tests (ADF & Phillips Perron statistics) in levels

Variable	Model Types	ADF Statistics	CV	PP Statistics	CV
l_P	Constant	-0.750219	-2.936942	-0.785848	-1.660163
	Constant/trends	-1.563025	-3.526609	-2.936942	-3.526609
l_MS	Constant	-0.394369	-2.936942	-0.430920	-2.936942
	Constant/trends	-1.830444	-3.526609	-1.926402	-3.526609
GFD	Constant	-2.369044	-2.936942	-2.369044	-2.936942
	Constant/trends	-3.105876	-3.526609	-3.157048	-3.526609
l_RY	Constant	-2.329465	-2.936942	-5.437061	-2.936942***
	Constant/trends	-2.066128	-3.526609	-1.896588	-3.526609
l_IR	Constant	-1.312778	-2.938987	-1.455345	-2.936942
	Constant/trends	-1.255103	-3.529758	-2.031427	-3.526609

Note: CV is critical values at 5%, and *** is CV at 1%. All the variables are in natural log except GFD.

Table 5.12

Unit roots tests (ADF & Phillips Perron) in first differences

Variable	Model Types	ADF Statistics	CV	PP Statistics	CV
l_P	Constant	-6.124223	-2.938987	-6.140571	-2.938987
	Constant/trends	-6.145869	-3.529758	-6.312910	-3.529758
l_MS	Constant	-5.672190	-2.938987	-5.686079	-2.938987
	Constant/trends	-5.598228	-3.529758	-5.613804	-3.529758
GFD	Constant	-6.745416	-2.938987	-7.917590	-2.938987
	Constant/trends	-6.173137	-3.548490	-7.778581	-3.529758
l_RY	Constant	-5.829829	-2.938987	-	-
	Constant/trends	-6.130763	-3.529758	-6.916525	-3.529758
l_IR	Constant	-8.939444	-2.938987	-8.913736	-2.938987
	Constant/trends	-8.906099	-3.529758	-8.952878	-3.529758

Note: CV is critical values at 5%. All the variables are in natural log except GFD.

Results in Table 5.11 show that all the variables tested at level demonstrate to have unit roots under the ADF test. Their ADF statistics are lower than their critical values at the 5% level. Therefore, the null hypotheses that the variables have unit roots at level are accepted at these critical values. The results of the PP statistics confirm the results obtained from ADF test at level with the exception of real output (RY) which constant model exhibits significance at level. With the exception of this variable (RY), the null hypotheses of the presence of a unit root cannot be rejected at the 5% level of significance for all the variables because the PP statistics for each of these variables (RY under constant model not included) are not greater than their 5% critical values.

Having confirmed that all the variables are almost non stationary at level, they are therefore subjected to first differences under the two testing methods. The results of ADF and PP tests displayed in Table 5.12 show that all the variables become stationary after differenced once. This implies that the null hypotheses of the existence of a unit root for each variable after differenced once are rejected at the 5% level of significance since their ADF and PP statistics are each more than the 5% critical values. The results of the unit root tests confirm the satisfaction of the Perasan et al.'s (2001) preconditions for the adoption of the ARDL approach to co-integration since each of the variables become I(1) after differenced once. Therefore, the study proceeds to test the existence of long run relationships among the variables using ARDL bound test procedure.

5.3.1 Bound testing for long run relationships

In order to test whether the variables have relationship in the long run, ARDL bound testing method of Perasan et al. (2001) is adopted. The null hypothesis that the variables are not co-integrated is stated as H_0: $\alpha_1 = \alpha_2 = \alpha_3 = \alpha_4 = \alpha_5 = 0$ against the alternative hypothesis that the variables have long run association, stated as H_1: $\alpha_1 \neq \alpha_2 \neq \alpha_3 \neq \alpha_4 \neq \alpha_5 \neq 0$. Two levels of critical values are provided with the lower level showing that all variables are I(0) while the upper level indicating that all variables are I(1). A Perasan et al.'s (2001) model with intercept and no constant is used. To take decision, the F-statistics are compared with the two levels of the critical value, from the chosen ARDL model. Each variable takes a turn to be considered as dependent variable for others. Table 5.13 reports the results obtained for the F-statistics computed and the Perasan et al. (2001) critical values are displayed along side the F-statistics.

Table 5.13
Results of bound test (F-tests) for co-integration

F-Statistics	Bound CV:90%		Bound CV:95%		Bound CV:99%	
	I(0)	I(1)	I(0)	I(1)	I(0)	I(1)
	2.425	3.574	2.850	4.049	3.817	5.122
F_P(P|MS,GFD,RY,IR) = 4.2060***						
F_{MS}(MS|P,GFD,RY,IR) = 4.5117***						
F_{GFD}(GFD|P,MS,RY,IR) = 0.4735						
F_{RY}(RY|P,MS,GFD,IR) = 1.7566						
F_{IR}(IR|P,MS,GFD,RY) = 2.7861*						

Note: * and *** represent 90% and 99% significant level respectively. CV is the critical value from Perasan et al. (2001). Null Hypothesis: there is no co-integration

According to the rules, reject the null hypothesis and accept that there is presence of co-integration if the F-statistics computed is more than the upper level of critical value. On the other hand, accept the null hypothesis that co-integration is not present if the F-statistics calculated is lesser than the lower level of critical value. If the value of F-statistics calculated is greater than the lower level but lesser than the upper level of critical value, then the test is inconclusive. By considering price level as dependent variable from the results Table 5.13, the F-statistics computed equals to 4.2060 and is greater than the upper bound at the 95% critical value band. This implies that the null hypothesis of no co-integration among price level (P), real money supply (MS), government fiscal deficit (GFD), real output (RY), and interest rate (IR) is rejected notwithstanding their co-integration order. When real money supply is considered as dependent variable, the F-statistics computed equals to 4.5117 and lies between the lower and upper bound at the 99% critical value band. This also implies that the null hypothesis of no co-integration among the variables is rejected when money supply takes turn as dependent variable. When government fiscal deficit and real output are individually considered as dependent variable, the F-statistics, 0.4735 and 1.7566 computed for each of them respectively, are each below the lower bound at the 90%, 95% and 99% level of significance. This implies that the null hypothesis of no co-integration among the variables is accepted for the government fiscal deficit and real output when each of them serves as dependent variable in an equation.

By considering the interest rate as dependent variable, the results indicate that the F-statistics (2.7861) computed falls between the lower and upper bound at the 90% level of significance, thus making the result inconclusive. Given that the result of interest rate is inconclusive, Kremers, Ericsson, and Dolado (1992); and Marashdeh (2005) have suggested that co-integration can also be established through the application of error correction model (ECM). Therefore, from the long run co-integration relationship, the error correction terms are obtained for the variables confirmed to be co-integrated with other variables.

5.3.2 Granger causality test between the pairs of variables

The results obtained from the bound test suggest the existence of long run association among the variables (price level, real money supply, government fiscal deficit, real income and interest rate). This is further confirmed by the results of error correction coefficient which is negative and significant when each of the variables (price level, money supply and interest rate) serves as dependent variable. Therefore, there must be a minimum of one-directional causality between the variables whch direction however, is not indicated by the co-integration results. The determination of such direction is implemented by the Granger causality tests which involve the estimation of a multivariate form of vector error correction model (VECM) (stated in equation 3.79 & 3.94) within the context of ARDL framework. Each variable takes turn to serve as dependent variable in equation 3.79 and 3.94. The one period lagged error correction term (*ECT_{t-1}*) obtained from the long run co-integration relationship is only added to the equation of price level, money supply and interest rate when each of them serves as dependent variables since they are co-integrated.

$$\Delta lnP_t = \gamma_0 + \sum_{i=1}^{k} \gamma_1 \Delta lnP_{t-i} + \sum_{i=1}^{k} \gamma_2 \Delta lnMS_{t-i} + \sum_{i=1}^{k} \gamma_3 \Delta GFD_{t-i} + \sum_{i=1}^{k} \gamma_4 \Delta lnIR_{t-i} + \sum_{i=1}^{k} \gamma_5 \Delta lnRY_{t-i} + \alpha_1 ECT_{t-1} + U_{1t} \qquad 3.79$$

On the other hand, (*ECT_{t-1}*) is excluded in equation 3.79 and 3.94 when government deficit or real output serves as dependent variable since they are not co-integrated. The results of Granger causality show the long run and short run causality in the context of the error correction mechanism. Chi-square statistics associated with the lagged regressors (independent variables) of the ECM determines the significance of the causal impacts in the short run while the t-statistics associated with the lagged ECT determines the significance of the causal impacts in the long run. The results of Granger causality obtained are displayed in Table 5.14.

Table 5.14

Results of Granger causality between pair of variables

Dependent Variable	Δl_P	Δl_MS	ΔGFD	Δl_RY	Δl_IR	ECT_{t-1}
Δl_P	-	16.889*** [0.000]	3.10E+13*** [0.000]	28.001*** [0.000]	220.419*** [0.000]	-0.997*** (-4.154)
Δl_MS	2.155 [0.142]	-	2.39E+11*** [0.000]	0.402 [0.526]	322.086*** [0.000]	-0.114*** (-10.454)
ΔGFD	2.563 [0.109]	0.160 [0.689]	-	0.205 [0.651]	2.724* [0.099]	-
Δl_RY	0.257 [0.612]	6.326** [0.012]	1.79E+12*** [0.000]	-	5.107** [0.024]	-
Δl_IR	0.105 [0.746]	0.425 [0.515]	2.94E+11*** [0.000]	0.001 [0.972]	-	-2.220** (-2.9008)

Note: Chi-square statistics in parenthesis [ ] and t-statistics in parenthesis ( ) are reported for all variables and ECT respectively. Also, 10%, 5% and 1% level of significance are represented by *, ** and *** respectively. Null Hypothesis: there is no Granger Causality.

Starting with the analysis of short run effects, the real money supply, government fiscal deficit, real output, and interest rate are significant at the 1% level in the price equation but price is not significant in the equation where real money supply is dependent variable which suggests that there is no feedback. Therefore, there is a unidirectional causality running from the real money supply to inflation in the short run. Similarly, the government fiscal deficit causes price level at the 1% significant level but price is not significant in the equation where the government fiscal deficit serves as dependent variable, suggesting the absence of feedback from price. For this reason, a unidirectional causality runs from the government deficit to price level in the short run. Short run causality also runs from the real output (significant at the 1% level) to inflation without any feedback since price is not significant in the equation where real output serves as dependent variable. Thus, a unidirectional causality exists between the inflation and real output in the short run.

Lastly, interest rate also becomes significant at the 1% level implying a causal to price level in the short run without a feedback from the price level since it is not significant in the equation where interest rate serves as dependent variable. Therefore, a unidirectional causality exists between interest rate and inflation in the short run. The short run unidirectional causality result from real money supply to inflation supports those obtained by Chimobi and Igwe (2010) for Nigeria; and Beltas and Jones (1993) for Algeria while the one running from fiscal deficit to inflation supports the results obtained by Cagan (1956) for Austria, Germany, Greece, Hungary, Poland, and Russia, Onwioduokit (1999), and Oladipo and Akinbobola (2011) for Nigeria.

Next is to consider the long run causality effect. The parameter estimates of one period lagged error correction terms are negative and significant in the equation of price level, and real money supply at the 1% level while in the interest rate equation it is also negative and significant at the 10% level. These support the initial bound test results which suggest the presence of co-integration. For the government fiscal deficit and real output equations, one period lagged error correction terms is omitted in each equation when each of them serves as dependent variable since there is absence of co-integration.

From Table 5.14, the Granger causality results show that the lagged error correction term is significant at the 1% level in the price equation. This means that variations in price level are function of disequilibrium in the long run association. That is, in the long run, real money supply, government fiscal deficit, real output, and interest rate granger cause price level. It can also be explained to imply that there are interactive running of causality from real money supply, government fiscal deficit, real output, and interest rate via the error correction term.

With the real money supply being the independent variable in another case, and its lagged error correction term is significant at the 1% level, it means that price level, government fiscal deficit, real output, and interest rate granger cause real money supply in the long run. In other words, bidirectional causality exists between the real money supply and price level in the long run. This result is parallelled to the one obtained by Khan and Siddiqui (1990); Bengali, Khan, and Sadaqat (1997) for Pakistan; Frenkel and Johnson (1977b) for Germany; and Sergent and Wallace (1973) for Austria, Germany, Russia, Greece, Poland, and Hungary. The results of Granger causality in Table 5.14 also indicate that the lagged error correction term for interest rate as dependent variable is also significant at the 5% level. This as well shows that bidirectional causality in the long run is flowing between price level and interest rate.

5.4 Results of the Monetary Model of Exchange Market Pressure

Before the estimation of the models, analysis of the data was done by carrying out the Augmented Dickey Fuller (ADF) tests for the confirmation of a unit root on domestic credit (DC), world inflation measured by the U.S consumer price index (WP), real income (RY), foreign reserves (FV), exchange rate (EX), and exchange market pressure, EMP (EX + FV). The results of the unit root test is presented in Table 5.15

Table 5.15
Results of the unit roots tests (ADF statistics)

Variable	Model Types	ADF Statistics (At Level)	ADF Statistics (First difference)	Order
DC	Constant	1.603728	4.979532***	I(1)
	Constant/trends	0.047238	5.035349***	I(1)
WP	Constant	-2.032924	-5.160325***	I(1)
	Constant/trends	-4.302497***	-	I(0)
RY	Constant	1.975421	-5.303287***	I(1)
	Constant/trends	- 0.464410	-5.837404***	I(1)
FV	Constant	14.69176***	-	I(0)
	Constant/trends	15.81625***	-	I(0)
EX	Constant	0.557682	-5.787631***	I(1)
	Constant/trends	-1.487233	-6.070563***	I(1)
EMP	Constant	-5.552864***	-	I(0)
	Constant/trends	-5.490456***	-	I(0)

Note: *** represents 1% level of significance

All the variables are not stationary at level as shown from the summarized results of the ADF tests in Table 5.15. Therefore, the null hypothesis of the presence of a unit root is accepted with the exception of WP (with the constant/trends model), FV, and EMP (with the two types of models: constant and constant/trends). These variables which are stationary at level have their ADF test statistics more than the 1%, 5% and 10% critical value. Hence, they are integrated of order 0. Other variables (DC, WP, RY and EX) which are non stationary at level are differenced once and they become stationary, thus rejecting the null hypothesis of the presence of a unit root. They are therefore, integrated of order 1.

5.4.1 Estimation of monetary model of exchange market pressure

The fundamental Exchange Market Pressure equation 3.82 given as EMP (ΔlnFV + ΔlnEX) that is estimated using DOLS approach of Stock and Watson (1993) is represented in equation 5.2. The objective is to test the theoretical hypotheses that: one, the percentage change in domestic credit (DC) is expected to be negative such that an increase in the domestic credit growth rate will lead to a proportional loss in the percentage change in international reserves (FV) and/or percentage of exchange rate (EX) increase (depreciation); two, the percentage change in the world price (WP) is expected to be positive such that when the world price increases, it will lead to proportional gain of international reserves and/or exchange rate decrease (appreciation); and finally, the percentage change in real income (RY) is expected to be positive such that when the real income increases, it will cause a proportional appreciation of domestic currency and/or international reserves inflow.

$$\begin{aligned} EMP_t = \beta_0 &+ \beta_1 lnDC_t + \beta_2 \Delta lnDC_t + \beta_3 \Delta lnDC_{t+1} + \beta_4 \Delta lnDC_{t-1} \\ &+ \beta_5 lnWP_t + \beta_6 \Delta lnWP_t + \beta_7 \Delta lnWP_{t+1} + \beta_8 \Delta lnWP_{t-1} \\ &+ \beta_9 lnRY_t + \beta_{10} \Delta lnRY_t + \beta_{11} \Delta lnRY_{t+1} + \beta_{12} \Delta lnRY_{t-1} + u_t \qquad 5.2 \end{aligned}$$

By following Stock and Watson (1993), an arbitrary leads and lags are chosen. This is followed by adding the first difference of independent variables, lead of the first difference of the independent variables and lag of the first difference of the independent variables as specified in equation 5.2. The β is the respective coefficient, Δ is the first difference operator, and ln is the natural logarithm. In order to give room for the interpretation of the parameters estimates as elasticities (Gawronka-Nowak & Grobowski, 2011), all the variables have been expressed in natural logarithm. Brooks (2008) notes that the expression of endogenous and exogenous variables of a regression model in natural logarithm form (often called double logarithmic) enables the analysis or interpretation of the estimated coefficients to be done in elasticity form.

The results of the estimates of coefficients of dependent variable (EMP) and the independent variables are presented in Table 5.16. The results show that the domestic credit has the expected negative sign with its coefficient not different from unity and is statistically significant at the 1% level. This evidence on domestic credit is in line with the monetary model of exchange market pressure. It also supports the monetary argument that excess increase in money supply resulting from excess increase in domestic credit causes the Nigerian reserves to continually decrease and/or the country's currency (*Naira*) to depreciate in value. This implies that with all other things being taken to be constant, a rise in the growth of domestic credit causes an outflow of Nigerian foreign reserve and depreciation in domestic currency.

Table 5.16
DOLS results of exchange market pressure

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.6218	0.2664	2.3339	0.0321**
D_LDC	-2.3949	0.5056	-4.7363	0.0002***
D_LWP	0.4351	0.2353	1.8495	0.0819*
D_LRY	-1.8610	0.8322	-2.2361	0.0390**
D_D_LDC	1.0320	0.3985	2.5895	0.0191**
D_D_LDC(1)	-0.4508	0.2148	-2.0991	0.0511*
D_D_LDC(-1)	0.5433	0.4379	1.2409	0.2315
D_D_LWP	0.1612	0.7051	0.2286	0.8219
D_D_LWP(1)	0.6499	0.3026	2.1477	0.0464**
D_D_LWP(-1)	-0.6787	0.5098	-1.3313	0.2007
D_D_LRY	1.1321	0.5531	2.0470	0.0564*
D_D_LRY(1)	-0.0961	0.1906	-0.5044	0.6205
D_D_LRY(-1)	0.6788	0.3228	2.1030	0.0507*

Note: All variables are in natural logarithm (L). *, **, *** represent10%, 5% 1% level of significance

For example, with the coefficient of DC being -2.3949, it means that an increase in domestic credit by 10% results in foreign reserve outflow by 23.949% or exchange rate depreciation by 23.949% or by proportion of the two simultaneously. This has important implication for the Nigerian monetary authorities in the sense that it determines the level of their independence. Attempt to increase the grow rate of domestic credit calls for the readiness to lose foreign reserve or depreciate the domestic currency. The result obtained with respect to domestic credit is similar to those gotten in the similar studies by Burdekin and Bukell (1990); and Girton and Roper (1977) for Canada, Connolly and da Silveira (1979) for Brazil, Parlaktuna (2005) for Turkey, Ghartey (2002, 2005) for Jamaica and Ghana respectively, and Kemme and Lyakir (2009) for Czech Republic.

From the results in Table 5.16, world price also turns out to be positively signed in support of the proposition that when the world price increases, there will be a proportional gain of international reserves and/or exchange rate decrease (appreciation).

The results show that the world price or foreign inflation is just statistically different from zero at the 10% level of significant. This implies that a 1% increase in the world price leads to a 0.4% gain of international reserves and/or exchange rate appreciation. The result also buttresses the exchange market pressure model. Previous studies that have obtained positive significant value for the coefficient of world price include Connolly and da Silveira (1979); and Girton and Roper (1977) for Brazil, Kim (1985) for Korean, Parlaktuna (2005) for Turkey, Ghartey (2002, 2005) for Jamaica and Ghana, respectively and Panday (2011) for Nepal. However, the value of the world price (0.435) obtained in this current study appears to be relative weak when compared to the aforementioned studies except for Parlaktuna (2005) in the case of Turkey and Panday (2011) for Nepal.

Furthermore, the results indicate that real income is negatively signed. This is in contrary to the proposition of the EMP model that the real income is expected to be positive such that when it increases, it will cause a proportional appreciation of domestic currency and/or international reserves inflow. The impact of real income on EMP in Nigeria is negative and statistically significant at the 5% level with p-value being 0.0390 and its coefficient is not different from unity as hypothesized. This implies that a 1% increase in the real income causes almost a 2% domestic currency depreciation and/ or the international reserves deterioration. Studies of EMP measurement which have obtained negative values for the coefficient of real income include Ghartey (2002, 2005) for Jamaica and Ghana respectively, Garcia and Malet (2007) for Argentina, Obstfeld (1982) for West Germany, and Panday (2011) for Nepal. Plausible explanation could be given in the case of Nigeria for the negative relationship of real income with EMP. For instance, when there is increase in real income, demand for money increases and as a result, aggregate demand for both domestic and foreign goods and services increase. The demand for foreign goods and services requires foreign currency. Therefore, the pressure on foreign currency depreciates the domestic currency. On the other hand, as the demand for money increases due to increase in real income, the aggregate demand for both foreign and domestic good and services increases. Consequently, adjustment is needed for the equalization of money demand and supply through the international reserves variation. In this process, the authorities buy domestic currency and both the international reserves, money demand and aggregate demand begin to fall in that order.

5.4.2 Residual diagnostic test of EMP model

DOLS regression employs Newey-West estimator in order to further address the likely problem of autocorrelation and heteroscedasticity associated with the model's error terms. The estimator corrects the presence of correlation and heteroscedasticity effects in the error terms of the time series regression overtime (Newey & West, 1987).

Table 5.17
Results of residual diagnostic test of EMP model

	Obs*R-squared	Prob. Chi-Square	Order
Breusch-Godfrey Serial Correlation	1.9647	0.1610	1
Heteroscedasticity Test: ARCH	3.0728	0.2152	2
Ramsey RESET Test	0.5232	0.3299	1
Jarque-Bera Normality Test	0.2464	0.8841	

In Table 5.17, the results of the residual diagnostic tests are presented. As suggested by

Stock and Watson (1993), chi-square is used for making inferences following the DOLS regression. The results show that the serial correlation LM test of Breusch-Godfrey accept the null hypothesis of no autocorrelation since p-value (0.1610) is greater than the 5% level of significance. Test for the presence of ARCH (Heteroscedasticity) also indicates the p-value (0.2152) which is more than the 5% level. Since the p-value exceeds the 5% significant level, the null hypothesis of absence of ARCH (Heteroscedasticity) cannot be rejected. The residual also displays that its behaviour is non linear as the RESET test (with the use of square of fitted values) indicates a p-value exceeding the 5% level of significance. The functional form therefore, confirms the right specification of the model. Lastly, Jarque-Bera test of normality also indicates that the residuals are normally distributed. Thus, the null hypothesis that the residual has a normal distribution cannot be rejected at the 5% level of significance with p-value of (0.884078).

Furthermore, figure 5.2 shows the explanatory power of the monetary model of exchange market pressure (EMP). Comparison is made between the actual movement and the predicted movement in dependent variable, EMP which composes the summation of the rate of EX and the change in FV. As shown by the figure, the prediction of the model appears reasonable as the predicted values or movement has a better reflection of the actual values. It can also be observed that the fitted values closely track down the movement of the actual values.

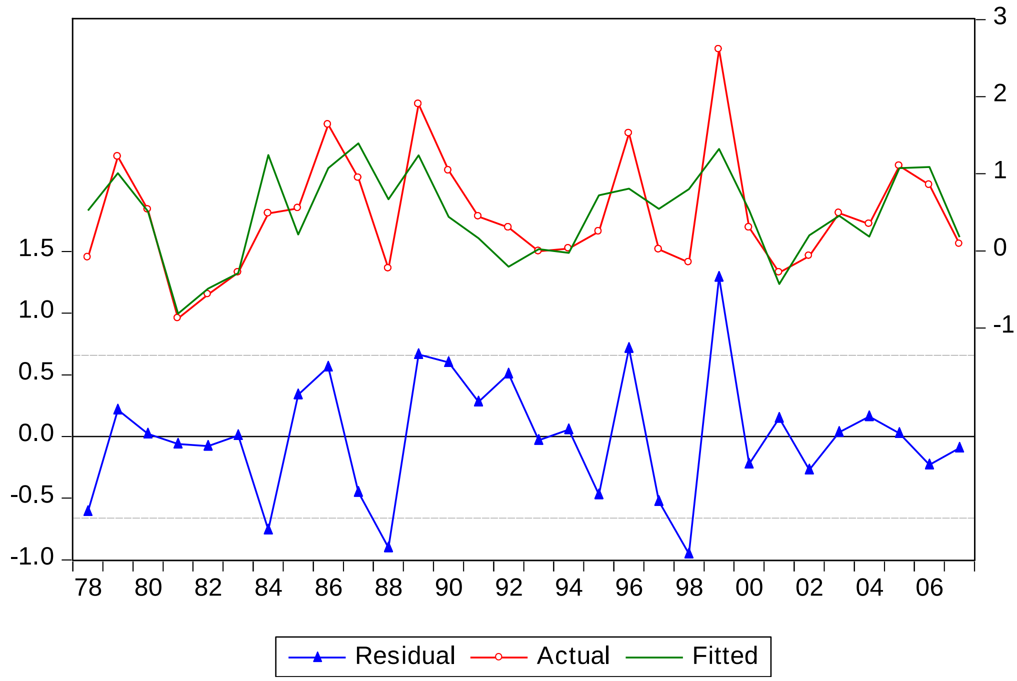

Figure 5.5
Actual and fitted exchange market pressure

5.4.3 Estimation of EMP model including independent variable (S)

In order to determine the main means by which the exchange market pressure or external imbalance is absorbed by the Nigerian monetary authorities, S variable is included in the explanatory variables of Exchange Market Pressure (EMP) model 3.82 and this results in equation 3.83. This process also tests how sensitive is the measure of EMP to changes in exchange rate and foreign reserve, and verifies the means by which pressure is absorbed by changes in each of the constituent variables of EMP. Equation 3.83 is estimated using DOLS approach as represented in equation 5.3.

$$\begin{aligned} EMP_t = \beta_0 + \beta_1 S_t + \beta_2 lnDC_t + \beta_3 \Delta lnDC_t + \beta_4 \Delta lnDC_{t+1} + \beta_5 \Delta lnDC_{t-1} \\ + \beta_6 lnWP_t + \beta_7 \Delta lnWP_t + \beta_8 \Delta lnWP_{t+1} + \beta_9 \Delta lnWP_{t-1} \\ + \beta_{10} lnRY_t + \beta_{11} \Delta lnRY_t + \beta_{12} \Delta lnRY_{t+1} + \beta_{13} \Delta lnRY_{t-1} + u_t \end{aligned} \quad 5.3$$

The variables in equation 5.3 are as defined earlier in this subsection except for the S variable. Girton and Roper (1977) suggest and add the ratio of exchange rate to foreign reserve (EX/FV) to EMP equation in order to achieve the earlier stated objective in this subsection 5.4.3. However, Connolly and da Silveira (1979) observe that this is appropriate where there is no discontinuity in (EX/FV). That is, where there is no frequent change of surplus to deficit and deficit to surplus during the study period. They point out that where there is discontinuity, S = (EX-1)/(FV-1) is the appropriate variable to use. Since there is discontinuity in the case of Nigeria, the researcher follows Connolly and da Silveira (1979); Ghartey (2005); and Parlaktuna (2005), by adding variable S to the EMP equation.

According to the theory, one can conclude that there is no discrimination in the absorption of Exchange market pressure EMP (defined as ΔEX + ΔFV) if the parameter estimate of variable S (defined as ΔEX-1)/ ΔFV-1) is not significant and the estimated results of percentage change in domestic credit (DC), the percentage change in the world inflation measured by the U.S consumer price index (WP), and the growth rate of income proxy by real gross domestic product (RY) are similar to those obtained in EMP equation 5.2 without S variable. This implies that EMP is insensitive to its constituent variables and the amount of intervention needed to absorb exchange pressure or external imbalance can be determined by the monetary authorities to use the international reserve and domestic currency depreciation simultaneously (Connolly & da Silveira, 1979; Ghartey, 2005; Girton & Roper, 1977; Parlaktuna, 2005; Stavarek, 2007). Suppose that the parameter estimate of variable S is positively significant while other results remain the same, it means that exchange pressure is absorbed by forfeiting international reserve only. On the other hand, if the parameter estimates of variable S is negatively significant while other result remain the same, then domestic currency depreciation is used to absorb the exchange pressure, cetiris paribus (Ghartey, 2005; Parlaktuna, 2005; Stavarek, 2007).

Table 5.18 presents the results of estimation for equation 5.3. From the results obtained, the parameter estimate of variable S is not significant and the estimated results of other exogenous variables are left unaltered or are almost similar to the results in Table 5.16 (EMP estimated results). This implies that there is no discrimination (no choice is made between EX and FV) in the absorption of exchange pressure (monetary shocks) by the Nigerian monetary authorities. Therefore, EMP is insensitive to its constituent variables. It further means that the amount of intervention needed to realize a targeted exchange rate can be determined by the monetary authorities by using the international reserve and exchange rate depreciation simultaneously. Previous studies that have obtained similar results as this include Stavarek, 2006 for Hungary in a study of 8 new European countries; Parlaktuna, 2005 for Turkey; Connolly and da Silveira, 1979 for Brazil; and Girton and Roper, 1977 for Canada.

One can conclude from the results that since the parameter estimate of variable S is not significant and the estimated results of other exogenous variables are left unaltered or are almost similar to the results of EMP earlier estimated, it means that the external imbalance or exchange market pressure is absorbed by losing the Nigerian international reserve and depreciation of its exchange rate at the same time.

Table 5.18

DOLS results of EMP model with S variable

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.5635	0.2634	2.1394	0.0482**
D_LDC	-2.3323	0.4375	-5.3313	0.0001***
D_LWP	0.4693	0.2391	1.9623	0.0674*
D_LRY	-1.8852	0.8573	-2.1991	0.0429**
S	-0.0028	0.0087	-0.3186	0.7542
D_D_LDC	0.9905	0.3345	2.9616	0.0092***
D_D_LDC(1)	-0.4428	0.2209	-2.0049	0.0622*
D_D_LDC(-1)	0.5323	0.4179	1.2737	0.2210
D_D_LWP	0.1550	0.7291	0.2126	0.8343
D_D_LWP(1)	0.7055	0.2997	2.3542	0.0317**
D_D_LWP(-1)	-0.6633	0.5240	-1.2657	0.2238
D_D_LRY	1.1274	0.5677	1.9857	0.0645*
D_D_LRY(1)	-0.1175	0.1873	-0.6274	0.5393
D_D_LRY(-1)	0.6834	0.3285	2.0801	0.0540 *

Note: All variables are in natural logarithm (L). *, **, *** represents 10%, 5% 1% level of significance

5.4.4 Residual diagnostic test of EMP model with S variable

Using similar approach, DOLS regression employs Newey-West estimator to correct for the probable autocorrelation and heteroscedasticity problems related to the model’s error terms. The standard errors of the estimated parameters are also corrected by the application of the Newey and West estimator approach. Table 5.19 displays the results obtained from the diagnostic tests of the residuals using the chi-square for making inferences, following the DOLS regression.

The results show that the serial correlation LM test of Breusch-Godfrey accepts the null hypothesis of no autocorrelation since p-value (0.1681) is greater than the 5% level of significance. Test for the presence of ARCH (Heteroscedasticity) also indicates p-value (0.2169) which is more than the 5% level. Since p-value exceeds the 5% significant level, the null hypothesis of absence of ARCH (Heteroscedasticity) cannot be rejected.

Table 5.19

Residual test results of EMP model with S variable

	Obs*R-squared	Prob. Chi-Square	Order
Breusch-Godfrey Serial Correlation	1.8998	0.1681	1
Heteroscedasticity Test: ARCH	3.0569	0.2169	2
Ramsey RESET Test	0.5473	0.3152	1
Jarque-Bera Normality Test	0.3533	0.8381	

The residual also displays that its behaviour is non linear as the RESET test (with the use of square of fitted values) indicates p-value (0.3152) exceeding the 5% level of significance. The functional form therefore confirms the right specification of the model. Lastly, Jarque-Bera test of normality also indicates that the residuals are normally distributed. Thus, the null hypothesis that the residual has a normal distribution cannot be rejected at the 5% level of significance with p-value of (0.838).

In order to analyze the explanatory power of the EMP model with the inclusion of S as independent variable, Figure 5.6 displays the actual values and the fitted values of the monetary model for the comparison of their trends. A close look at the figure shows that the predicted values appear to have tracked down the actual values considerably well. The movement of the predicted values has the reflection of the actual movement and the two trends follow the same pattern. This implies that the EMP model with the inclusion of independent variable S demonstrates a goodness of fit.

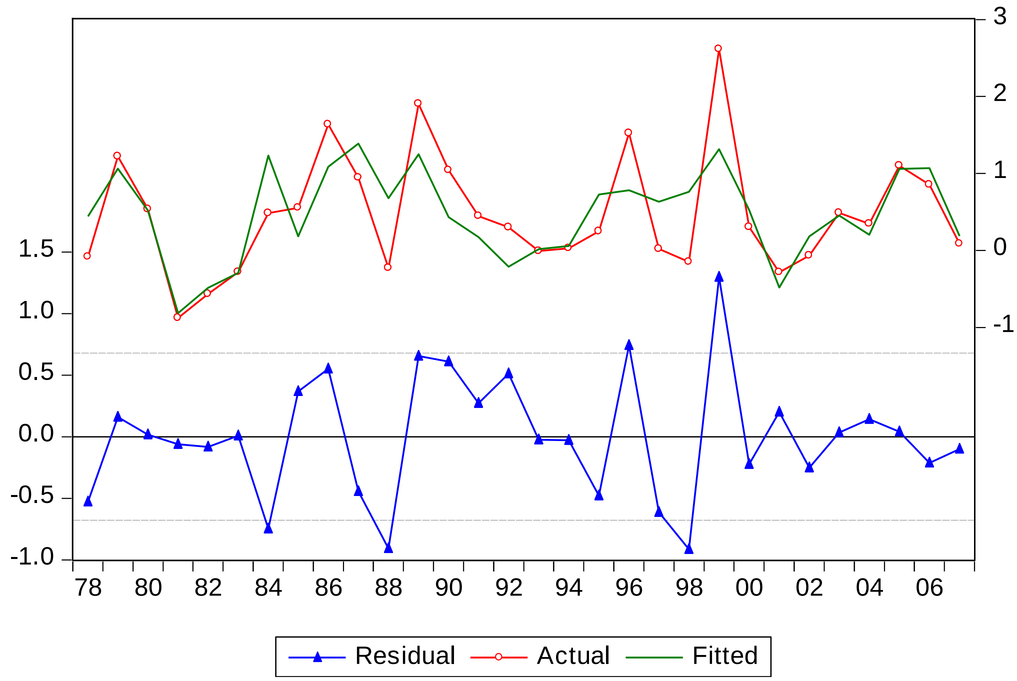

Figure 5.6
Actual and fitted exchange market pressure with S variable

5.4.5 Estimation of individual component of EMP model

In order to examine the efficiency of the exchange market pressure (EMP), attempt is made to compare the results obtained from the regression of each component of EMP (ΔFV and ΔEX) as individual dependent variable on EMP's explanatory variables.

5.4.5.1 Estimation of Nigerian foreign reserve model

When the rate of change in foreign reserve (ΔFV) is singly used as dependent variable with EMP's explanatory variables, the reserve equation (or balance of payments) 3.84 is represented in equation 5.4 and estimated using DOLS approach.

$$\Delta lnFV_t = \beta_0 + \beta_1 lnDC_t + \beta_2 \Delta lnDC_t + \beta_3 \Delta lnDC_{t+1} + \beta_4 \Delta lnDC_{t-1}$$
$$+ \beta_5 lnWP_t + \beta_6 \Delta lnWP_t + \beta_7 \Delta lnWP_{t+1} + \beta_8 \Delta lnWP_{t-1}$$
$$+ \beta_9 lnRY_t + \beta_{10} \Delta lnRY_t + \beta_{11} \Delta lnRY_{t+1} + \beta_{12} \Delta lnRY_{t-1} + u_t \qquad 5.4$$

The DOLS results obtained are presented in Table 5.20. The results of the parameter estimates appear to be considerably good. For example, the R-squared computed is 0.64 which implies that the variation in foreign reserve that could be explained by its explanatory variables is about 64%. Similarly, the Prob. (F-statistics) is 0.0417, implying that the explanatory variables (jointly) are significantly different from zero at the 5% level. It further means that the domestic credit, world price and real income jointly impact Nigerian foreign reserve.

From the results obtained, the coefficient of domestic credit is negative and it is significant at the 1% level with p-value equals to 0.0002. This implies that with all other things being held constant, a rise in the growth of domestic credit causes an outflow of Nigerian foreign reserve. It further means that attempt by the Nigerian monetary authorities to increase the grow rate of domestic credit by 1% calls for their readiness to lose foreign reserve by 200% to absorb the monetary shocks (exchange pressure).

The results show that world price or foreign inflation is just statistically different from zero at the 10% level of significance and its coefficient is positively signed as expected implying that as the world price increases, there will be a proportionate accumulation of international reserves. Finally, the real income also turns out to be negatively signed and statistically significant at the 5 percent level with p-value of 0.0390. This implies that as the Nigerian real income increases in magnitude, the international reserves deteriorate proportionately.

Table 5.20

DOLS estimates of foreign reserve model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.3327	0.2525	1.3178	0.2050
D_LDC	-2.0063	0.4305	-4.6607	0.0002***
D_LWP	0.4312	0.2380	1.8118	0.0877*
D_LRY	-1.7368	0.6574	-2.6418	0.0171**
D_D_LDC	0.7171	0.4225	1.6970	0.1079
D_D_LDC(1)	-0.3978	0.1863	-2.1352	0.0476**
D_D_LDC(-1)	0.1503	0.4453	0.3376	0.7398
D_D_LWP	0.0078	0.4331	0.0180	0.9858
D_D_LWP(1)	0.3865	0.2157	1.7914	0.0910*
D_D_LWP(-1)	-0.3887	0.3964	-0.9804	0.3406
D_D_LRY	1.0244	0.3730	2.7461	0.0138**
D_D_LRY(1)	-0.0290	0.1878	-0.1546	0.8790
D_D_LRY(-1)	0.5494	0.1967	2.7933	0.0125**

Note: All variables are in natural logarithm (L). *, **, *** represents 10%, 5% 1% level of significance

5.4.5.2 Residual diagnostic test of foreign reserve model

The results of residual diagnostic test of foreign reserve model are presented in the following Table 5.21 using Chi-Square for inferences. From the table, the Breusch-Godfrey test of autocorrelation of order 1 yields P (χ2 (1) > 0.184179) = 0.6678. Since the p-value is greater than the 5 percent level of significance, the null hypothesis of no serial correlation cannot be rejected. The test for heteroscedasticity of order 2 gives p-value = P (χ^2 (2) > 3.254637) = 0.1965. It can be observed that the p-value is more than the 5 percent level of significance and for this reason, the null hypothesis of absence of ARCH effect is accepted.

Table 5.21
Diagnostic test results

	Obs*R-squared	Prob. Chi-Square	Order
Breusch-Godfrey Serial Correlation	0.1842	0.6678	1
Heteroscedasticity Test: ARCH	3.2546	0.1965	2
Ramsey RESET Test	0.7782	0.8476	1
Jarque-Bera Normality Test	0.4022	0.8178	

Ramsey RESET Test of functional form indicates that the model is well specified and has better functional form since p-value (0.8476) is greater than the 5% significant level. The Jarque-Bera Normality test yields p-value equal to 0.817819 implying that the residuals of the model are normally distributed at the 5% significant level. Furthermore, the explanatory power of the Nigerian foreign reserve is shown in Figure 5.7.

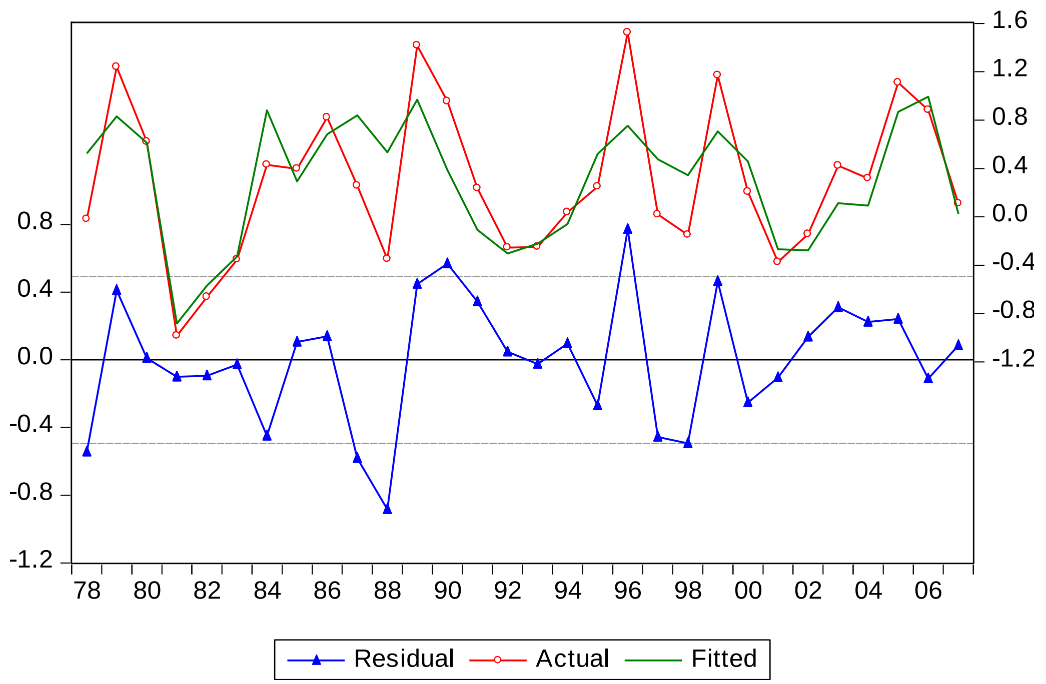

Figure 5.7
Actual and fitted foreign reserve

The figure presents the movements of the actual and predicted values of the reserve model. By comparison, the predicted values closely trace out the actual value. Considerably, the movement of the actual values is reflected by that of predicted values. Hence, the figure displays that foreign reserve model has a better goodness of fit.

5.4.5.3 Estimation of Nigerian exchange rate model

When percentage in exchange rate (ΔEX) is singly used as dependent variable with EMP's explanatory variables, the exchange rate equation 3.92 is represented in equation 5.5, and is estimated using DOLS approach.

$$\begin{aligned} \Delta lnEX_t = \beta_0 &+ \beta_1 lnDC_t + \beta_2 \Delta lnDC_t + \beta_3 \Delta lnDC_{t+1} + \beta_4 \Delta lnDC_{t-1} \\ &+ \beta_5 lnWP_t + \beta_6 \Delta lnWP_t + \beta_7 \Delta lnWP_{t+1} + \beta_8 \Delta lnWP_{t-1} \\ &+ \beta_9 lnRY_t + \beta_{10} \Delta lnRY_t + \beta_{11} \Delta lnRY_{t+1} + \beta_{12} \Delta lnRY_{t-1} + u_t \end{aligned} \qquad 5.5$$

The results obtained are presented in Table 5.22. The results as can be seen do not yield better estimates of parameters when compared with the foreign reserve model. Although the variables of interest such as domestic credit, world price and real income maintain their right signs, they are however, not significant in impacting the exchange rate. In addition, the variation in exchange rate that could be explained by the explanatory variables is very low as the R-squared (0.35) computed is as low as 35%. Similarly, the Prob. (F-statistics) is 0.6888, implying that it is not significant at the 5% level. It can be inferred from the results of foreign reserve model and exchange rate model that the estimated results for the former is better than that of latter one. Therefore, it is concluded that the main means of absorbing most of exchange market pressure or external imbalance in Nigeria is by foreign reserve rather than exchange rate adjustment. In particular, such absorption results in depleting more of the country foreign reserve compared to exchange rate depreciation.

Table 5.22
DOLS estimates of exchange rate model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.2890	0.2133	1.3554	0.1930
D_LDC	-0.3885	0.3645	-1.0660	0.3013
D_LWP	0.0039	0.1659	0.0235	0.9815
D_LRY	-0.1242	0.5397	-0.2301	0.8208
D_D_LDC	0.3150	0.1994	1.5798	0.1326
D_D_LDC(1)	-0.0530	0.1004	-0.5281	0.6043
D_D_LDC(-1)	0.3930	0.1584	2.4804	0.0239**
D_D_LWP	0.1534	0.3991	0.3843	0.7055
D_D_LWP(1)	0.2634	0.1960	1.3440	0.1966
D_D_LWP(-1)	-0.2900	0.1622	-1.7879	0.0916*
D_D_LRY	0.1078	0.3239	0.3326	0.7435
D_D_LRY(1)	-0.0671	0.1129	-0.5940	0.5603
D_D_LRY(-1)	0.1294	0.1778	0.7279	0.4766

Note: All variables are in natural logarithm (L). *, ** represents 10%, 5% 1% level of significance

5.4.5.4 Residual diagnostic test of exchange rate model

Residual Diagnostic test results of exchange rate model are given in Table 5.23. From the table, the Breusch-Godfrey test of autocorrelation of order 1 gives the p-value of 0.6516 which is greater than the 5 percent level of significance. Therefore, the null hypothesis of no serial correlation is accepted. Heteroscedasticity test of order 2 gives p-value of 0.6992 which is greater than 5 percent significance level. Therefore, the null hypothesis that there is no ARCH effect cannot be rejected. However, Ramsey RESET Test of functional form shows that the model functional form is not okay since the p-value (0.0296) is smaller than the 5% significant level. The Jarque-Bera Normality test indicates that the residuals of the model are not normally distributed at the 5% significant level with p-value equals to 0.007315.

Table 5.23
Diagnostic test results

	Obs*R-squared	Prob. Chi-Square	Order
Breusch-Godfrey Serial Correlation	0.2039	0.6516	1
Heteroscedasticity Test: ARCH	0.7158	0.6992	2
Ramsey RESET Test	3.7906	0.0296	1
Jarque-Bera Normality Test	9.8358	0.0073	

Figure 5.5 gives the explanatory power of the exchange rate model. The movements of the actual values and the predicted values when compared perform better in reflecting each other in the first 7 year after which they deviate till the end of the period. This suggests that the model of exchange rate has poor fit.

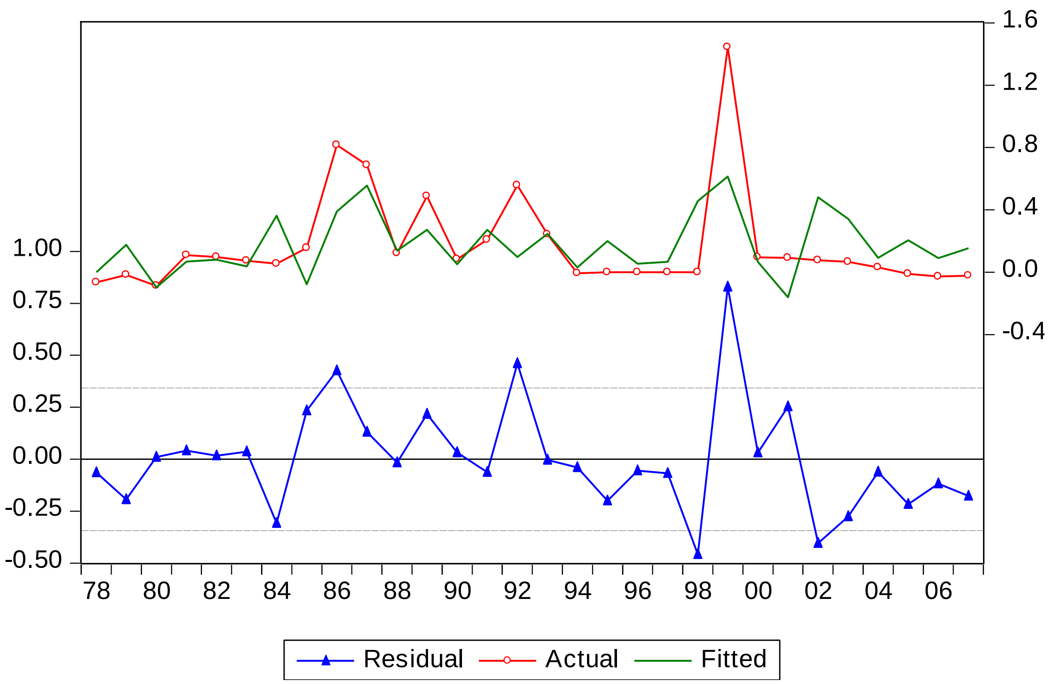

Figure 5.8
Actual and fitted exchange rate

CHAPTER SIX

SUMMARY AND CONCLUSION

6.1 Summary

This study broadly explores the effects of fiscal policy on Nigerian balance of payment over the period covering 1970 to 2010. In order to purse this broad objective, the fiscal, monetary and balance of payment performances were analyzed to provide better understanding of the developments in Nigeria. Then, the study examined how the Nigerian government authorities adjust the desired level of alternative forms of nominal spending and income from taxes to a variation in the level of price, and how fast are such adjustments as shown in actual spending adjustment decision. This provides the opportunity to establish the existence or otherwise of government fiscal deficit within the economy rather than imposing it on a priori basis. In what follows as consequence of government deficit, excess money supply and inflation seem to be prevalent in the economy. Therefore, their motivating factors are determined in order to provide direction for policy focus. Lastly, external imbalance or exchange market pressure as an ultimate consequence of the causation effect of fiscal deficit was investigated to determine the country’s sources of its absorption.

For the realization of the above stated objectives, the study first adopted descriptive analysis which deals with the fiscal, monetary and balance of payments developments in Nigeria over the period 1970 to 2009. Also, it employs the following four econometric techniques which deal with the times series analysis over the period 1970 to 2010. First, the three-stage least squares (3SLS) method was employed to estimate the public sector (government expenditure and revenue) models in order to establish the fiscal deficit as linked to inflationary or price level. Second, the vector error correction model (VECM) is used to determine the association of macroeconomic variables in order to establish the effects of fiscal policy. This also involves the estimation of the Johansen and Juselius (1990) co-integration for the money supply equation. The third technique involves the application of autoregressive distributed lag (ARDL) approach of Perasan and Shin (1999), and Perasan, Shin and Smith (2001) for the bound testing of co-integration among the price level, real money supply, government fiscal deficit, interest rate and real output when each of the variable take turn to serve as dependent variable in an equation. Following the bound test of co-integration, the study went further to examine the causality between a pair of variables using Granger causality approach. Finally, the study employs the leads and lags regression method of Stock and Watson (1993), otherwise known as dynamic ordinary least squares (DOLS) regression in order to estimate the monetary model of Exchange Market Pressure.

In general, the results obtained from the current study are quite interesting. For example, the descriptive analyses of the fiscal, monetary and balance of payment performances in Nigeria over the period 1970 to 2009 provided evidence that Nigeria had a greater inflow of resources dominated by foreign one in the revenue realized during the period. Deficit financing was therefore considered to be the standard fiscal policy given the nature of the country oil wealth. Therefore, financing huge fiscal deficits were mostly carried out through the central bank credit. The increase in domestic credit brought about increased money supply and this led to inflation in the country. This also led to the expansion of imports demand whice further deteriorated the balance of payment, and motivated borrowing to finance the external deficits. This suggests that unfavourable balance of payment in Nigeria is somehow attributable to the type of fiscal policy implemented.

Evidences from the estimation of the structural model of government expenditure using 3SLS methods show that income has positive effect on government expenditure and significant at the 1% level. This implies that government spending increases in relation to increase in real level of income. Both price expectation and expected inflation show significant positive sign, implying that when there is a rise in inflation, nominal government expenditure increasingly adjusts in response to it. Also, evidences from the estimation of the structural model of government revenue using 3SLS method show that income has positive influence on government expenditure and significant at the 10% level. This implies that as real income level increases there will be increase in the total government revenue. The price expectation indicates significant positive sign meaning that government revenue or income also adjusts increasingly during the period of expected rise in price. The evidences from the estimation of the two structural models indicate that the Nigerian government authorities positively adjust the desired level of alternative forms of nominal spending and income from taxes to a variation in the level of price.

Evidences also abound with respect to the speed of adjustments. Results show that the income elasticity in the long run for both government spending (g_1=1.841) and revenue (t_1 =0.928) are not quite different from unity. This implies that both of them will have a proportionate movement with the level of inflation. In addition, the results indicate that the average time lag in the adjustment of nominal government spending (2.390) is shorter as compared to that of nominal revenue (3.695). The implication is that government expenditure quickly adjusts to meet up with the increase in the level of income and prices while nominal revenue collected from taxes lags behind in its adjustment. Consequent upon increase in government expenditure not meeting up with revenue is an increase in deficits. As far as the nominal revenue continues to lag behind relative to the expenditure of government, there will always be a continuous increase in deficits.

Results of the estimation of Johansen co-integration tests and estimated real money supply model are reported. The two Johansen tests indicated that there were three co-integration equations in the analysis. The long run estimates for money supply model indicates that all the independent variables are significant in explaining the variations in endogenous variable. The government fiscal deficit is not correctly signed but significant in influencing the growth of money supply in the long run. However, the domestic credit to private sector has the right sign as expected and exhibits significant positive influence on the supply of real money supply. This result is similar to the result of Korsu (2009) where domestic credit to private sector is also found to have positive effect on money supply in the study of external sectors of Sierra Leone. The interest rate is negatively signed and significant in affecting the growth of money supply which suggests that an increase in interest rate tends to lower the real money supply. The negative relationship between money supply and interest rate supports the liquidity effect view in economic theory which implies that for interest rate to rise there must be reduction in money supply. This result supports the previous results obtained in the past related studies by Ezeabasilli and Mojekwu (2011) for Nigeria, and Funke (2001) for Euroland. Another important variable that has the expected sign, and is significantly different from zero is the price. The coefficient of price is positive and significant, thus contributing to the growth of real money supply in the long run. On the whole, the results reveal that the observed growth in the real money supply in Nigeria is fundamentally determined by the government deficit, domestic credit to private sector, interest rate, and the price level in the long run.

From the short run estimate of the real money supply model, the results show that the error correction term is negative and significantly different from zero at the 1 percent level of significance. The estimated value of the error correction term for this model is 0.71 representing the misalignment in the short run that will cause the real money supply (MS) to restore its long run equilibrium. This implies an approximate feedback of 0.71% of the disequilibrium in the past year. The coefficient of the error correction term indicates the speed of adjustment to equilibrium. In this case, it corrects the previous disequilibrium at the speed of 0.71% annually. All the explanatory variables play significant role in determining the real money supply in the short run. For example, the real money supply serves as exogenous variable with its coefficient of one period lags being positive and significant at the 1% level. This means that an increase in the real money supply in the one period ago causes an increase in the current real supply of money. The two period lag of government deficit exerts positive influence on real money supply at the 5% level of significance. This suggests that the real money supply increases as the total deficit of government grows. Similar studies using Nigerian data that have reported the significant positive impact of fiscal deficit on money supply include Adam and Bankole (2000), Chimobi and Igwe (2010), Ndebbio (1988), Onwioduokit (1999), and Oyedeji (1972).

The four periods lagged value of domestic credit to private sector has positive significant influence on the real money supply implying that domestic credit to private sectors contributes to the growth of real money supply. This result is paralleled to the finding of Korsu (2009) for Sierra Leone data. The influence of four period lag of price level on real money supply is positive and significant at the 5% level implying that the higher the price level the higher the real money supply. The significant positive impacts of price on money supply have previously been reported in some studies (See for example, Aghevli & Khan, 1977; Akhtar, 2005; Dulton, 1971; Frenkel & Johnson, 1977; Hoover, 1991; Sergent & Wallace 1973).

In support of the Fisher equation perspective in economic theory that the money supply and interest rate have positive relationship as against the liquidity effect view of Keynesian economic theory which argues for negative relationship between the money supply and interest rates. The one period lagged and the three periods lagged value of the interest rate are found to be positively signed and significant at the 1% and 5% level, respectively. These results support those obtained by Monnet and Weber (2001), and Alatiqi and Fazel (2008) in their previous studies.

The study also reported variance decomposition for the real money supply computed from VECM. Results show that at the end of the longer period, the 15-year horizon, about 30 percent of the forecast error variance in the real money supply is explainable by innovation in GFD (2%), DCP (15%), IR (6%) and P (8%). This shows that causality from DCP to MS is strong. By considering the own shock along the diagonal, the domestic credit to private sector (DCP) appears to have large own shock of 69.2%. This shows that DCP is the most exogenous variable within the system while the rest explanatory variables only provide explanation of about 30.8% of its forecast variance. Furthermore, it could be observed that the percentage of variance explanation by own shock for P is just 4.8% relative to others. This proves that its shock is rooted from other macroeconomic variances within the system. Therefore, the estimates indicate that in the system, P is the most dependent (endogenous) variable.

The results of ARDL bound test for co-integration when each of price, money supply, government fiscal deficit, interest rate, and real output serves as dependent variable in an equation are also reported. By considering price level as dependent variable, the F-statistics computed and is greater than the upper bound at the 95% critical value band. This implies that the null hypothesis of no co-integration among price level (P), real money supply (MS), government fiscal deficit (GFD), real output (RY), and interest rate (IR) is rejected notwithstanding their co-integration order. When real money supply is considered as dependent variable, the F-statistics computed lies between the lower and the upper bound at the 99% critical value band. This also implies that the null hypothesis of no co-integration among the variables is rejected when money supply takes turn as dependent variable. When government fiscal deficit and real output are individually considered as dependent variable, the F-statistics computed for each of them are below the lower bound at the 90%, 95% and 99% level of significance. This implies that the null hypothesis of no co-integration among the variables is accepted for the government fiscal deficit and real output when each serves as dependent variable in an equation. By considering interest rate as dependent variable, the results indicate that the F-statistics computed falls between the lower and upper bound at the 90% level of significance, thus making the result inconclusive.

The study further performed Granger causality tests which involves the estimation of a multivariate form of vector error correction model (VECM) within the context of ARDL framework. Results of Granger causality test in the short run indicate that the real money supply, government fiscal deficit, real output, and interest rate are significant at the 1% level in the price equation but price is not significant in the equation where each of these explanatory variables serve as dependent variable. This suggests that there is no feedback. Therefore, there is a unidirectional causality running from real money supply to inflation in the short run. The Granger causality results also show that the lagged error correction term is significant at the 1% level in the price equation. This means that in the long run, the real money supply, government fiscal deficit, real output, and interest rate granger cause price level. With the real money supply being the independent variable in another case, and its lagged error correction term is significant at the 1% level, it means that price level, government fiscal deficit, real output, and interest rate granger cause real money supply in the long run. In other words, there is bidirectional causality running between the real money supply and price level in the long run. Furthermore, the results of Granger causality indicate that the lagged error correction term for interest rate as dependent variable is also significant at the 5% level. This as well shows that bidirectional causality in the long run is flowing between price level and interest rate.

The study also estimated the monetary model of exchange market pressure (EMP) using the DOLS method. Results indicate that the coefficient of domestic credit (DC) is -2.394867. This means that an increase in domestic credit by 10% results in foreign reserve outflow by 23.949% or exchange rate depreciation by 23.949% or by proportion of the two simultaneously. Also, world price turns out to be positively signed and significant at the 10% level in support of the proposition that when the world price increases, there will be a proportional gain of international reserves and/or exchange rate decrease (appreciation). The impact of real income on EMP is negative and statistically significant at the 5% level. This implies that as the real income grows higher in Nigeria, the domestic currency depreciates and/ or the international reserves deteriorate proportionately. Generally, it can be concluded that the estimated results for EMP in Nigeria buttress the EMP propositions.

In order to determine the main means by which the exchange market pressure or external imbalance is absorbed by the monetary authorities in Nigeria, S variable was included in the explanatory variables of EMP model. This process also tests how sensitive is the measure of EMP to change in exchange rate (EX) and foreign reserve changes (FV), and verifies the means by which pressure is absorbed by changes in each of the constituent variables of EMP. Since the parameter estimate of variable S is not significant and the estimated results of other exogenous variables are left unaltered or are almost similar to the results of EMP earlier estimated, it means that the external imbalance or exchange market pressure is absorbed by losing the Nigerian international reserve and depreciation of its exchange rate at the same time. This implies that there is no discrimination (no choice is made between EX and FV) in the absorption of exchange pressure (monetary shocks) by the Nigerian monetary authorities. Therefore, EMP is insensitive to its constituent variables.

The study estimates individual component of EMP model in order to determine the efficiency of EMP. When foreign reserve (FV) is singly used as dependent variable with EMP's explanatory variables, the estimated results show that the coefficient of domestic credit is negative and it is significant at the 1% level of significance. This implies that with all other things being held constant, a rise in the growth of domestic credit causes an outflow of Nigerian foreign reserve. The results show that world price or foreign inflation is just statistically difference from zero at the 10% level of significance and its coefficient is positively signed. This impies that as the world price increases, accumulation of international reserves will increase proportionately. Finally, the real income is negatively signed and statistically significant at the 5% level. This implies that as the Nigerian real income increases in magnitude, the international reserves deteriorate proportionately. On the other hand, when the exchange rate (EX) is singly used as dependent variable with EMP's explanatory variables, the results show that all the variables of interest such as domestic credit, world price, and real income maintain their right signs. They are however not significant in impacting the exchange rate. This show that the exchange rate model did not yield better estimates of parameters when compared with the foreign reserve model. Therefore, the main means of absorbing most of exchange market pressure or external imbalance in Nigeria is by foreign reserve rather than exchange rate adjustment. In order words, more of the country foreign's reserve is used for absorbing external pressure than exchange rate depreciation.

6.2 Conclusion

In conclusion, increase in government fiscal deficits in Nigeria as a result of increase in government expenditure not meeting up with revenue. This means that as far as the nominal revenue continues to lag behind relative to government spending there will always be continuous deficits increase. The government deficit further influnces the real money supply positively. This suggests that the real money supply increases as the total deficit of government grows in the short run. In addition, since most of the deficits are financed by domestic credit, the impacts of domestic credit are also felt in the economy. Evidences reveal that domestic credit to private sectors has a strong positive influence on the real money supply. Therefore, domestic credit to private sectors also contributes immensely to the growth of real money supply.

Consequently, the growth of real money supply influences the price level to increase. Evidently, at the early period unidirectional causality runs from real money supply to inflation in the economy while at later period it manifested into bidirectional causality, implying that both the real money supply and price level cause each other. The roles of real output and interest rate on inflation are also pronounced in the economy. The most significant determinant of inflation is the real output. It has negative strong impact on price level, implying that the inflation will reduce as output increases. In addition, evidence of the interest rate influence shows that bidirectional causality in the long run is flowing between price level and interest rate.

In Nigeria, credit creation of the Central Bank through domestic credit became the most frequently use means of financing government deficits. This increases domestic money supply and price level which in turn affect trade balance and external debt. In general, an increase in budget deficit tends to raise domestic absorption and worsens the balance of payment. For example, excess money created due to deficit financing increases the real money balances of domestic households which they tend to get rid by increasing their aggregate spending on goods. The domestic prices of goods go up thus making foreign goods cheaper. Demand for foreign products is higher and as a result export is reduced and import increased thus creating a channel for a trade balance deficit. Alternatively, excess money balance is disposed off to buy foreign assets, which is recorded as capital account deficit. The two ways of getting rid of excess money balances have the unfavourable consequences on the balance of payment. Evidently, the Nigerian offsetting coefficient (for the domestic credit, DC) is -2.394867 base on the results of this study. This means that an increase in domestic credit by 10% results in foreign reserve outflow by 23.949% or exchange rate depreciation by 23.949% or by proportion of the two simultaneously. It means that the external imbalance or exchange market pressure is absorbed by losing international reserve and depreciation of its exchange rate at the same time. Further examination provides evidence that the main means of absorbing most of the exchange market pressure or external imbalances in Nigeria is by foreign reserve rather than exchange rate adjustment. In particular, such absorption results in depleting more of the country’s foreign reserve compared to exchange rate depreciation.

The significances and contributions of this study are many as earlier pointed out. To start with, this study analyzed the fiscal, monetary and balance of payment performances in Nigeria in order to uncover the interactive effects among these variables. This is particularly importance because knowing their interactive effects has the capability of guiding the policy makers on the designation of the appropriate and reliable fiscal policy for government's implementation. Such, if correctly implemented could promote the achievement of the country's macroeconomic stability. The analysis may also shed light on the best way by which public expenditure and budget management could be planned to ascertain that public resources are channelled to the right use in the economy. Moreover, it may provide the right clues to the government on how to widen its resources and prevent the public expenditure and revenue from been liable to the vulnerability of the unstable world oil prices. This to a large extent could serve as a probable way of reducing credit from the banking system as source of deficit financing which consequently reduce money supply, inflation and balance of payment problems.

Furthermore, evidence that the government expenditure adjusts rapidly more than its revenue informs the imminent of fiscal deficits. Such information if known earlier could likely suggest the necessity to review the present budgetary stimulus to inflation with commitment and determination so as to make adjustment where necessary. In addition, this study tends to establish the relationship among the macroeconomic variables such as those related to the determinants of money supply, and price level. Doing this facilitates proper understanding of the role played by the fiscal policy-inflation relation in the creation and amelioration of the growing balance of payments problem in Nigeria. Knowing this is capable of providing suggestions which could be useful in preventing further worsening of the crisis. In addition, having the knowledge of the interactive effects of these variables concerned could provide more information about the extent to which expansionary fiscal policy has constrained the conduct of the monetary policy in realizing a reasonable general price level or inflation. This in effect could serve as a signal to the monetary authorities to abide by the prudent fiscal operations which will not rely on banking system, particularly Central Bank of Nigeria, for financing. More so, it could motivate effective coordination between monetary and fiscal policies which could further be maintained and strengthened.

Furthermore, the employment of EMP in this study is essential as compared to exchange rates variation as it can have more relevance in determining other phenomena. The case of IMF (2007) provides justification where EMP was employed by IMF to study sufficient policy responses to a sudden increase in the amount of capital inflows. Also, EMP can be useful to the spectators to search opportunities for profit, and to the decision makers to prevent from other countries the spread of contagion because EMP is better in giving signal of tensions mounted more than the exchange rate variation. Furthermore, the measurement of the EMP may serve as a guide to policy makers in making useful monetary policy. It may furnish useful information to both the public and private sectors regarding exchange rate, international reserve, level of income and interest rate that could influence the nature and degree of transactions. Secondly, the measurement of EMP could also provide information that could be useful to monitor monetary and financial policy domestically and internationally.

The current study may be very relevant to Economic Community of West African Countries where monetary and exchange rate policies are centrally determined. Also, budget deficit to 4 per cent of GDP are to be maintained by member countries with central bank financing such deficit to 10 per cent of revenue realized in the year before

(Paul & Catherine, 2001). The results of the current study provide the likely implications of fiscal deficits on some macroeconomic variables such as output, price level, money supply and balance of payment. Knowing these implications is likely to provide an insight into the formulation and designation of appropriate fiscal policy in Nigeria and other members of the union because far from the efficient provision of public goods, fiscal policy performed stabilizing role

6.3 Policy Recommendations

In developing countries like Nigeria, the problems of macroeconomics are traceable to fiscal phenomenon. Therefore, fiscal dominance in this country has made sound fiscal discipline an essential condition for the realization of non-inflationary monetary policy. With fiscal dominance, the realization and sustainability of macroeconomic stability depend on the extent of regulating the authority of the government in fiscal policy. This calls for the designation and implementation of the right policies to achieve credible fiscal behaviour given that the authority of the government in conducting fiscal policy may not be easily curtailed.

Since the Central Bank is constrained to curtail fiscal deficit, it becomes difficult for it to achieve the objective of relatively low inflationary rate, stable interest and exchange rate in the economy. Therefore, where fiscal policy is dominant, monetary policy may become impotent. Macroeconomic problems emanate from the fiscal policy and the solution to fiscal deficit should be sourced from fiscal policy. In particular, fiscal viability which entails fiscal deficit reduction through fiscal restriction could be appropriate in this regard. One probable way is to implement policies which support the application of credit restriction rules to curtail credit from the banking system as source of deficit financing since excess credit results in significant depleting of international reserve.

In order to sustain and realize the wide macroeconomic goals of the country, there is a need to implement policies that improve efficiency in the utilization of the public resources. Public expenditure and budget management must be strongly governed or planned to ascertain that public resources are channelled to appropriate use. Investment spending should be improved to bring about growth desired to alleviate the poverty level. Many projects are for long time outstanding in the budget while others have been abandoned. These projects should be examined to know if they actually meet the preference of the country, need to be continued if resources are efficiently directed to them. This measure is capable of reducing profligacy in public spending.

On the revenue aspect, there is a need to enhance the management of the country's revenue from oil as this will assist to direct the country to take the path of fiscal stability. Just as it is common in other developing countries, pro-cyclical has been the practice in Nigerian fiscal policy which has accounted for the country's public deficit. Therefore, there is a need for fiscal policy rule since fiscal discipline is lacking in the government. This will guide the government to a particular level of fiscal conduct and budgetary management to the extent of making it credible over time. This would also go a long way to encourage sound fiscal discipline across other local and state governments. For example, fiscal rule on prices of oil could assist in lessening the pro-cyclicality, where excess revenue are saved during high oil prices and be used for desired spending during the period of low oil prices. This significantly depends on the level of political commitment in executing it. Policies should be implemented to improve public revenue especially the non-oil revenue as this tends to widen the government resources and curtail the public expenditure and revenue susceptible to the volatility of world oil prices.

6.4 Limitations of the Study

This study is not free from limitations in spite of the efforts made at obtaining robust and reasonable findings. One probable inherent limitation to this study is the unavailability of good quality data which of course could have given room for more sound and complex analysis. In addition, this shortage of data availability has prevented further disaggregation of some variables into different components and their inclusion in the models. This constraint is recognized in the course of pursuing this research. However, attempt was made to overcome to a reasonable extent and it is believed that this study can possibly provides useful information to the understanding of the role played by fiscal policy in determining inflation rate, money supply, and external imbalance for the economy and signal to future studies in the area.

It is important to point out that this study has not really modelled fiscal deficit relationship with external debt for investigation in spite of the role of fiscal deficit in contributing to external debt problem in Nigeria. Therefore, this study could be extended by employing panel data technique to investigate government debt relationship with deficits on annual data basis. The impact of fiscal deficit on other key variables such as private investment, and private consumption could also be a good exercise to extend the study in order to ascertain the possibility of crowding-in or -out effects of government expenditure resulting in deficits. Such exercise can also allow one to verify and explains the extent to which fiscal policy is countercyclical or otherwise in the current economic trends. It is hoped that future studies would consider these aspects.

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