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An Empirical Analysis of Fiscal Deficits and Inflation in Nigeria

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Abstract

The relationship between fiscal deficits and inflation has provoked considerable interest in the macroeconomics literature. While the theory postulates that fiscal deficits lead to inflation, empirical research has been less conclusive about the relationship. This paper reexamines the issue in the context of a developing country, Nigeria, using data over 1970–2006, a period of persistent inflationary trends. We adopted a modeling approach that incorporates cointegration techniques and structural analysis. The results reveal a positive but insignificant relationship between inflation and fiscal deficits in Nigeria. We did not also find any strong evidence linking past levels of fiscal deficits with inflation in Nigeria during the period. Rather, we report a positive long run relationship between money supply and inflation in the Nigerian economy, suggesting that money supply is procyclical and tends to grow at a faster rate than inflation rate.

Key words: Fiscal deficit; Inflation; Cointegration; Money supply; Nigeria

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INTRODUCTION

The dominant role of the public sector in initiating and financing economic development and the resultant growth in public spending makes net public expenditure inevitable, especially in developing countries. While the growth in public expenditure may stimulate budget deficit which is expected to be financed by public revenues in different ways, of historical macroeconomic concern is the consequence of the interrelationship between budget deficit and its mode of financing. Furthermore, the fact that public spending may outstrip revenue, or that there might be a shortfall in revenue relative to public spending, is not only illuminating and relevant but also tends to encourage calculative relations of an empirical sort between fiscal deficit and associated variables, such as inflation.

One of the perennial policy challenges facing Nigeria, and indeed most developing countries, is inflation and how to control it. The challenge of controlling inflation has both monetary and fiscal policy implications. Fiscal deficit may be unavoidable in the developmental process; however, it is the level, magnitude and mode of its financing and the tendency thereof to yield undesirable macroeconomic consequences (Ubogu, 1982) that have galvanized empirical assessment of the relationship between deficits and contextual variables.

The growth and persistence of fiscal deficit is not country-specific; it is a phenomenon prevalent in developed and developing economies alike (Ezeabasili, 2009). For instance, in the United States of America, the growth in federal deficit provided the impetus for a reassessment of the effects of fiscal deficit on economic activities

(Islam and Wetzel, 1991). Fiscal deficit has been blamed for much of the economic crisis that has plagued many developing countries since the 1980s (See for example, Tchokote, 2004; Ezeabasili, 2009). This concern has made the reduction of fiscal deficits one of the cornerstones of short-term stabilization and medium-term adjustment programs (Islam and Wetzel, 1991; Adam and Bankole, 2000). In Nigeria, for example, since the 1970s, the government's expenditure has been on the increase, mostly exceeding its revenue. The volatile revenue base combines with increasing public expenditure profile to make the persistence of fiscal deficits inevitable. For example, during the 39-year period (1970–2008), Nigeria witnessed 33 years of fiscal deficits, with only 6 years of surplus fiscal operations (Central Bank of Nigeria, 2008).

Thus, unraveling the relationship between budget deficit and inflation has remained a source of both theoretical interest and empirical concern for macroeconomists and policy makers all over the world (see, for example, De Hann and Zelhorst, 1990; Njeru and Randa, 1999; Onwioduokit, 1999; Perotti, 2004; Rother, 2004; Sill, 2005). This concern stems from the plausibility that governments would incur budget deficits and their propensity to finance such through debt instruments or seigniorage. Thus, the key to understanding the relationship between budget financing and inflation is the recognition that government deficit spending is linked to the quantity of money in circulation within an economy through the government's budget constraints. The budget constraint implies that any deficit must be somehow financed. While taxes and borrowing remain main sources of financing Federal and State governments' budgets, Central government can also use monetary policy (borrowing from the banking system) as an alternative means to finance its deficit.

In Nigeria, fiscal deficits were generally financed from excessive borrowing from the banking sector and external sources (National Center for Economic Management and Administration, 2004). A number of studies have consequently looked at the relationship between inflation and fiscal deficits. Studies in this area include the works of Oyejide (1972), Adeyeye and Fakiyesi (1980), Osakwe (1983), Akinnifesi (1984), Asogu, (1991), and Onwioduokit (1999). However, not only did these studies yield conflicting results and conclusions, perhaps due to the inelegant methodology adopted in analyzing their research data, but more importantly, the time frame considered in many of them was rather short. These observed shortcomings have left a trail on knowledge gap in the literature, thus warranting the need for more systematic examination of the phenomena of interest, that is, the relationship between fiscal deficit and inflation. The prospect of a promising lead in addressing this deficiency underscores the importance of this study.

Our treatment of the subject matter differs from past studies in several important aspects. First, we are able to draw on an extensive literature of the latest contributions and methodological shortcomings of many extant studies. This is a considerable advantage in retrospection. Second, the study sample comprises broad longitudinal data set spanning 1970-2006. This is because this period produced bouts of large fiscal deficits, interspersed, especially in the early 1970s, with surpluses of N171.6 million in 1971, N166.1 million and N1796.4 million in 1973 and 1974, N1461.7million in 1979, N1000 and N32049.1million in 1995 and 1996. The study period also corresponds to and witnessed regimes of economic reforms in Nigeria. Another important shortcoming of most previous studies which the current study seeks to overcome is that explicit attention was not paid to the time-series characteristics of the data used. Using recent developments in time series econometrics as provided by Engle and Granger (1987), Andrew (1991), Phillips and Peron (1988), Dickey and Fuller (1979), Newey and West (1994), MacKinnon (1996), this study is able to distinguish between long- and short-term effects of the variables in the model adopted.

The remainder of this paper is organized as follows. Section II presents the background to the study. Section III sketches the context of the study through an overview of the related literature. Section IV highlights the theoretical considerations and lays out the econometric methodology. The results are reported in Section V. Section VI concludes the paper.

1. BACKGROUND TO THE STUDY

Fiscal policy plays a key role in the sustenance of economic growth and achievement of macroeconomic stability. The magnitude of government fiscal surplus or deficit is probably one of the most important statistics used to measure the impact of government fiscal policy on the economy (Siegal, 1979; Tanzi and Blejer, 1984). In the advanced countries like the United States of America, the federal deficit provided the impetus for a re-assessment of the effect of fiscal deficits on economic activities (Islam and Wetzel, 1991). In the less developed countries including Nigeria, fiscal deficits have been blamed for much of the economic crises that beset them since the 1980s; over-indebtedness and the debt crises; high inflation; poor investment performance and growth (Onwioduokit, 1999). However, the reduction of fiscal deficits, has been one of the cornerstones of short-term stabilization and medium-term adjustment programmes (Islam and Wetzel, 1991).

In Nigeria, the objective of the fiscal policy is to generate surpluses/public savings, while maintaining economic stability. The policy is geared towards maintaining balance of payment equilibrium, price and exchange rate stability, enhance growth rate and improve employment, that is, to achieve macroeconomic stability and real growth of the national economy. The public sector assumes this role because of the failure of the market economy to achieve

a stable equilibrium with a fair distribution of income largely due to the existence of market imperfections (Ike, 2002). In addition, private sector development that drives the economy is inchoate in most developing countries. The prevalence of political instability and the myriad of socioeconomic problems associated with bad leadership and poor governance all combine to dwarf market development and ultimately contribute to large fiscal deficits.

In response to the economic crises of the 1980s, which included external debt overhang, Nigeria commenced in 1986 the implementation of a comprehensive economic reform programme (ERP) which focused on short-term and medium-term policy reforms to structurally adjust the economy. The structural adjustment programme (SAP) was aimed at stimulating supply and creating favourable conditions for the restoration of the economy along the path of sustainable growth. The adoption of tight monetary and fiscal policies was a major policy tool for enhancing the success of SAP (Adam and Bankole, 2000). The fiscal measures were designed to rescue government fiscal programmes. Some of the measures included policies to widen the government revenue base, reduce subsidies and imports, reduce government involvement in economic activities and relocate resources in favour of the private sector. More worrisome is the fact that budget deficits have persisted over the years despite the ERP (Adam and Bankole, 2000).

Given the volatile revenue base of government and upwards trend in government expenditure pattern over the years, the occurrence of fiscal deficits has become inevitable. It has been argued that in the process of economic development, especially in developing economies, fiscal deficits should be regarded as essential elements in the developmental process (National Center for Economic Management and Administration, 2004). However, in practice, it has been observed that the level, magnitude and especially, the method of financing have tended to produce undesirable macroeconomic effects (Ubogu, 1982).

Fiscal deficits in Nigeria were generally financed by the excessive borrowing from the banking sector and external sources (National Center for Economic Management and Administration, 2004). The central bank accounted for a large proportion of the financing from the banking sector (Central Bank of Nigeria, 2004). Empirical evidence in most developing countries has shown that the methods of financing have resulted in high monetary expansion, high inflation, high public debt, exchange rate depreciation, deterioration in balance of payments, sluggish or negative growth rates, high interest rates including the crowding out of the private sector investment, corruption, financial sector distress and unemployment (Onwioduokit, 1999).

Over a period of over three and half decades (1970 – 2006), the fiscal operations of the Nigerian government resulted in surplus in only six (6) years. Specifically, these surpluses occurred in 1971, 1973, 1974, 1979, 1995 and 1996. As at 1986, federal nominal fiscal deficit stood at N8.3billion or 11.3 per cent of GDP. The deficit/GDP ratio was 5.4 per cent in 1987, 8.4 per cent in 1988 and 6.7 per cent in 1989, respectively. The ratio increased to 11.0 per cent in 1991, 15.5 per cent in 1993. The fiscal deficit grow by 58 per cent between 1985 and 1986 while the real GDP growth rate was a mere 3.1 per cent. Between 1991 and 1992 the fiscal deficits grew by 60.9 per cent, increasing to 86.2 per cent in 1998. Between 1999 and 2006, fiscal deficits/GDP ratios were 8.4, 2.9, 4.7, 5.6, 2.9, 1.7, 1.1 and 0.6 per cent, respectively. In absolute terms, these percentages represent N285.1billion, N103.6billion, N221.0billion, N201.4billion, N202.7billion, N172.6billion, N161.4billion and N101.3billion, respectively (Central Bank of Nigeria, 2004, 2005 & 2006) (see Table 1).

Table 1
Overall Budget Balance as Percentage of GDP in Nigeria (1970 – 2006)

YEAR	OVERALL BALANCE (1)	FISCAL DEFICIT/GDP (2)	INFLATION (3)	BALANCE OF PAYMENT (4)
1970	-455.1	-8.7	13.9	-0.8
1971	+171.6	2.6	16.0	64
1972	-58.8	-0.8	3.4	-
1973	166.1	1.5	4.6	-
1974	1,796.4	9.8	13.5	-
1975	427.9	-2.0	33.9	-
1976	-1,090.8	-4.0	21.1	-339.0
1977	-781.4	-2.4	21.5	-527.2
1978	-2,821.9	-7.8	13.3	1293.6
1979	1,461.7	3.4	11.6	1868.9
1980	-1,975.2	-3.9	10.0	2402.2
1981	-3,902.1	-7.7	21.4	-3020.8
1982	-6,104.1	-11.8	7.2	-1398.3
1983	-3,364.5	-5.9	23.2	-301.3

To be continued

Continued

YEAR	OVERALL BALANCE (1)	FISCAL DEFICIT/GDP (2)	INFLATION (3)	BALANCE OF PAY-MENT (4)
1984	-2,660.4	-4.2	40.7	354.9
1985	-3039.7	-4.2	4.7	349.1
1986	-8,254.3	-11.3	5.4	-5667.1
1987	-5,889.7	-5.4	10.2	-18264.8
1988	-12,160.9	-8.4	56.0	-20795.0
1989	-15,134.7	-6.7	50.5	-22993.5
1990	-22,116.6	-8.5	7.5	-5761.9
1991	-35,755.2	-11.0	12.9	-15796.6
1992	-39,532.5	-10.4	44.5	-101404.9
1993	-107,735.3	-15.3	57.3	-42060.4
1994	-70,270.6	-7.7	57.0	-42623.3
1995	+1,000	0.1	73.1	-195316.3
1996	+32,049.4	1.6	29.1	-52,152.0
1997	-5,000	-0.2	8.5	1076.3
1998	-133,389.3	-4.7	10.0	-220675.1
1999	-285,104.7	-8.4	6.6	-326634.3
2000	-103,800	-2.9	16.9	314139.2
2001	-221,000	-4.7	18.9	24729.9
2002	-301,000	-5.6	12.9	-565353.3
2003	-202,700	-2.9	14	-162,839.7
2004	-172,600	-1.5	15	1,128,383.4
2005	-161,400	-1.1	17.9	-
2006	-101,300	-0.6	15.03	-

Source:Central Bank of Nigeria Statistical Bulletin (various issues)

The economic environment that guided monetary policy before 1986 was characterized by the dominance of the oil sector, the expanding role of the public sector in the economy and over-dependence on the external sector. In order to maintain price stability and a healthy balance of payments position, monetary management depended on the use of direct monetary instruments such as credit ceilings, selective credit controls, administered interest and exchange rates, as well as the prescription of cash reserve requirements and special deposits. The use of market-based instruments was not feasible at that point because of the underdeveloped nature of the financial markets and the deliberate restraint on interest rates(Central Bank of Nigeria,2006). The most popular instrument of monetary policy was the issuance of credit rationing guidelines, which primarily set the rates of change for the components and aggregate commercial bank loans and advances to the private sector. The sectoral allocation of bank credit in Central Bank of Nigeria guidelines was to stimulate the productive sectors and thereby stem inflationary pressures. The fixing of interest rates at relatively low levels was done mainly to promote investment and growth (Central Bank of Nigeria,2003). Occasionally, special deposits were imposed to reduce the amount of free reserves and credit-creating capacity of the banks. Minimum cash ratios were stipulated for the banks in the mid-1970s on the basis of their total deposit liabilities, but since such cash ratios were usually lower than those voluntarily maintained by the banks, they proved less effective as a restraint on their credit operations.

From the mid-1970s, it became increasingly difficult to achieve the aims of monetary policy. Generally, monetary aggregates, government fiscal deficit, GDP growth rate, inflation rate and the balance of payments position moved in undesirable directions. Compliance by banks with credit guidelines was less than satisfactory. The major source of problems in monetary management was the nature of the monetary control framework, the interest rate regime and the non-harmonization of fiscal and monetary policies. The monetary control framework, which relied heavily on credit ceilings and selective credit controls, increasingly failed to achieve the set monetary targets as their implementation became less effective with time. The rigidly controlled interest rate regime, especially the low levels of the various rates, encouraged monetary expansion without promoting the rapid growth of the money and capital markets. The low interest rates on government debt instruments did not sufficiently attract private sector savers and since the Central Bank of Nigeria was required by law to absorb the unsubscribed portion of government debt instruments, large amounts of high-powered money were usually injected into the economy. In the oil boom era, the rapid monetization of foreign exchange earnings resulted in large increases in government expenditure which substantially contributed

to monetary instability. In the early 1980s, oil receipts were insufficient to meet increasing levels of government expenditure and since expenditures were not rationalised, government resorted to borrowing (from the Central Bank) to finance huge deficits. This had adverse implications for monetary management.

The Structural Adjustment Programme (SAP) was adopted in July, 1986 following the crash in the international oil market and the resultant deteriorating economic conditions in the country. It was designed to achieve fiscal balance and balance of payments viability by altering and restructuring the production and consumption patterns of the economy. These would be achieved by eliminating price distortions, reducing heavy dependence on crude oil exports and consumer goods imports, enhancing the non-oil export base and achieving sustainable growth. Other aims were to rationalise the role of the public sector and accelerate the growth potentials of the private sector. The main strategies of the programme were the deregulation of external trade and payments arrangements, the adoption of a market-determined exchange rate for the Naira, substantial reduction in complex price and administrative controls and more reliance on market forces as a major determinant of economic activity.

The objectives of monetary policy since 1986 remained the same as in the earlier period, namely: the stimulation of output and employment, and the promotion of domestic and external stability (Central Bank of Nigeria,2003). In line with the general philosophy of economic management under SAP, monetary policy was aimed at inducing the emergence of a market-oriented financial system for effective mobilization of financial savings and efficient resource allocation. The main instrument of the market-based framework is the open market operations. This is complemented by reserve requirements and discount window operations. The adoption of a market-based framework such as OMO in an economy that had been under direct control for long, required substantial improvement in the macroeconomic, legal and regulatory environment. In order to improve macroeconomic stability, efforts were directed at the management of excess liquidity; thus a number of measures were introduced to reduce liquidity in the system. These included the reduction in the maximum ceiling on credit growth allowed for banks; the recall of the special deposits requirements against outstanding external payment arrears to Central Bank of Nigeria from banks, abolition of the use of foreign guarantees/ currency deposits as collaterals for Naira loans and the withdrawal of public sector deposits from banks to the Central Bank of Nigeria. Also effective August 1990, the use of stabilization securities for purposes of reducing the bulging size of excess liquidity in banks was re-introduced. Commercial banks' cash reserve requirements were increased in 1989, 1990, 1992, 1996 and 1999 (Central Bank of Nigeria, 2003).

The rising level of fiscal deficits was identified as a major source of macroeconomic instability. Consequently, government agreed not only to reduce the size of its deficits but also to synchronize fiscal and monetary policies. By way of inducing efficiency and encouraging a good measure of flexibility in banks' credit operations, the regulatory environment has improved. Consequently, the sector-specific credit allocation targets were compressed into four sectors in 1986, and to only two in 1987. From October, 1996, all mandatory credit allocation mechanisms were abolished (Central Bank of Nigeria, 2006). The commercial and merchant banks were subjected to equal treatment since their operations were found to produce similar effects on the monetary process. Areas of perceived disadvantages to merchant banks were harmonized in line with the need to create conducive environment for their operations. The liquidity effect of large deficits financed mainly by the Bank led to an acceleration of monetary and credit aggregate in 1998, relative to stipulated targets and the performance in the preceding year. Outflow of funds through the Central Bank of Nigeria weekly foreign exchange transaction at the Autonomous Foreign Exchange Market (AFEM) and, to a lesser extent, at Open Market Operation (OMO) exerted some moderating effect.

The reintroduction of the Dutch Auction system (DAS) of foreign exchange management in July, 2002 engendered relative stability, and stemmed further depletion of reserves during the second half of 2002. However, the financial system was typically marked by rapid expansion in monetary aggregates, particularly during the second half of 2000, influenced by the monetization of enhanced oil receipts. Consequently, monetary growth accelerated significantly, exceeding policy targets by substantial margins. Savings rate and the inter-bank call rates fell generally due to the liquidity surfeit in the banking system though the spread between deposit and lending rates remained wide. Overtime, the Central Bank of Nigeria has recognized that achieving stable prices would require continuous reassessment and evaluation of its monetary policy implementation framework to enable it respond to the ever-changing economic and financial environment. It is against this background that the Bank introduced a new monetary policy framework that took effect on 11 th December, 2006. The ultimate goal of the new framework is to achieve a stable value of the domestic currency through stability in short-term interest rates around an "Operating Target", the interest rate, which is determined and operated by the Central Bank of Nigeria. The "Operating Target" rate i.e. the "Monetary Policy Rate" (MPR), serves as an indicative rate for transaction in the inter-bank money market as well as other Deposit Money Banks' (DMBs) interest rate (Central Bank of Nigeria,

2007).

The main operating principle guiding the new policy is to control the supply of settlement balances of banks and motivate the banking system to target zero balances at the Central Bank of Nigeria, through an active inter-bank trading or transfer of balances at the Central Bank of Nigeria. This is aimed at engendering symmetric treatment of deficits and surpluses in the settlements accounts, so that for any bank, the cost of an overdraft at the Central Bank would be equal to the opportunity cost of holding a surplus with the Bank. The Central Bank intervention in the market takes the form of a standing lending facility that which ensures orderly market operations or behaviour by alternating avoidable interest volatility. The standing lending facility is available as an overnight lending to banks with deficits, at a fixed interest rate, i.e. the upper band of the Central Bank of Nigeria standing facility. The Bank stands ready to supply any amount the banks may require at the lending rate. The Central Bank also set up a standing facility that pays banks with surplus funds, a fixed interest rate in their deposit or reserves which they keep with the Bank. This arrangement allows the Bank to keep the overnight inter-bank interest rate in between the corridor with an upper and lower limit on interest rate (2007).

MPR was set at 10 per cent, using the then rate of inflation rate and the expected inflation rate outcome of 9.0 per cent for fiscal 2006 as a guide to ensure that interest rates remain positive in real terms. There is a spread of 600 basis points around the rate, i.e. 300 basis points below and 300 basis points above. This translates into an upper limit of 7 per cent, representing that rate at which Central Bank of Nigeria takes deposits from the banks. A major advantage of the new framework is that the Central Bank is able to operate in the market daily and ensures adequate liquidity is provided to enable banks trading in the inter-bank market to complete settlement at interest rates around the MPR. Inter-bank rate is, therefore, maintained at a level between the lending and deposits rates at Central Bank of Nigeria. The maintenance of interest rates band has helped significantly to reduce volatility in the market compared to the inter-bank rates experienced in the past (Central Bank of Nigeria, 2008).

2. REVIEW OF RELATED LITERATURE

There is a general concession among economists, such as Milton Friedman, that inflation is strictly a monetary phenomenon. What has remained contentious, however, is the range of conventional views about the appropriate measures to control inflation (Mortaza, 2006). According to the Friedman's Quantity theory of money, the consensus view is that the growth in the quantity of money is a primary determinant of the inflation rate (Mankiw, 1997). This is the conventional monetarist linkage from the creation of base money to inflation when Central Banks issue money at a rate that exceeds the demand for cash balances at the existing price level and the increased demand in the goods market pushes up the price level as the public tries to get rid of the excess cash holdings. But, this monetarist perspective contends that Central Banks can eliminate the link between budget deficit and inflation by refusing to monetize the deficit, that is, by not buying the bonds issued by government (Akcay and Alper, 1996). In contrast, Mortaza, (2006) posits that in developing countries, inflation is not purely a monetary phenomenon but is often linked with fiscal imbalances and deficiencies in sound internal economic policies. Montiel (1989), Sergent and Wallace (1981) and Liviatan and Piterman (1986) argue that factors typically related to fiscal imbalance, such as higher money growth and exchange rate depreciation arising from a balance of payments crisis dominate the inflation process in developing countries.

The debate about the effects of fiscal deficits on macroeconomic variables such as inflation has generated considerable interest as well as controversy in the theoretical and empirical literature (Ezeabasili, 2009). At the theoretical level, the divergence is woven around the financing of deficit. While the theoretical debate persists, in practice, fiscal deficit has remained an important issue, especially for developing countries. Macroeconomic theory suggests that fiscal deficits cause inflation (Catão and Terrones, 2003). The theory argues that fiscally dominant governments running persistent deficits have the proclivity to seigniorage to finance the deficits, which consequentially or ultimately cause inflation (Sargent and Wallace, 1981). However, as Catão and Terrones (2003) have posited, empirical research has had limited success in establishing this relationship. While economic theory does not rule out the importance of other mechanisms that potentially fuel inflation, fiscal imbalances have remained central to most models (Ljungqvist and Sergent, 2000; and Fischer, Sahay and Veigh, 2002).

The contradictory findings from several studies, as noted above, suggest that empirical research, on the average, has had little success in establishing a strong and statistically significant connection between fiscal deficits and inflation across a broad range of countries and inflation spectrum. This perspective is buttressed by King and Plosser's (1985) comprehensive analysis of the determinants of seigniorage in the United States and twelve (12) other countries, using both single equation OLS regressions and VARs, which found no significant causality between fiscal deficits, change in base money and inflation. Also, De Haan and Zelhort (1990) found a weak connection between seigniorage and budget deficits except during very high inflation episodes. Using OLS estimates of the determinants of seigniorage in a cross section of 78 (mostly developing) countries, Click (1998) reached the conclusion that fiscal variables play

no significant role in inflationary trend. However, using a more restricted sample of high inflation developing countries, Montiel (1989) and Dornbusch, Sturzenegger, and Wolf (1990) found evidence which suggests that fiscal deficits tend to accommodate, rather than drive, inflation. The authors attribute this mainly to a combination of exchange rate shock and inflationary inertia.

We provide further evidence on the inconclusiveness of extant research on the relationship between fiscal deficits and inflation from a select number of country studies. In his study of the macroeconomics of public sector deficits in Morocco, Fiani (1991) observed that inflation appeared to be subdued despite the prevalence of large budget deficits. His finding does not support macroeconomic postulation that large deficits fuel inflation. On the other hand, Perrotti's (2004) study of five OECD countries, observed that under plausible values of price elasticity, government spending typically has small effects on prices. This contrasts with Barro's (1989) conclusion that budget deficit contributes to growth of money supply and inflation. The work of Islam and Wetzel (1991) in Ghana revealed that financing of deficit by money creation fuelled inflation. In the case of Kenya, Njeru and Randa (1998) posited that financing the deficit through increase in monetary base stimulated inflation. Kenya's evidence corroborates Tchokote's (2004) empirical work on Cameroun that financing fiscal deficits influences real balances indirectly through inflation which is negatively related to the demand for money. Also the work of Easterly and Schmidt-Hebbel (1993) provides strong evidence that, over the medium term, money financing could lead to higher inflation.

Recent studies by Fischer, Sahay, and Vegh (2002) classified a sample of 94 countries into high-inflation and low-inflation countries. While they show that fiscal deficits are main drivers of inflation, they also find that changes in budget balances have no significant inflationary effect in low inflation countries, or during low inflation episodes in historically high-inflation countries. Catão and Terrones (2003) used very broad dataset and a new modeling approach that incorporated two key features of the macroeconomic theory, spanning 107 countries over 1960 – 2001 for a total of 3,607 observations. Their results showed a strong positive association between fiscal deficits and inflation among high-inflation and developing countries, but not among low-inflation advanced economies. In an earlier study of the long-run relationship between the two variables in a panel of 23 emerging market countries during 1970-2000, Catão and Terrones (2001) uncover a positive, relatively strong, and statistically significant fiscal deficit-inflation relationship in emerging markets. Their results are broadly similar to those of Fischer, Sahay, and Vegh (2002) which spanned 94 countries for a total of 2,318 observations. Overall, these studies establish the statistical significance of the macroeconomic assertion of fiscal deficit-inflation relationship across a broad range of countries and inflation rates.

Using Turkish annual data and co-integrating vectors, Akay, Alpher and Ozmucur (1996) noticed the existence of a stable long-run relationship between budget deficit, money growth and inflation. Sill (2005) posits that monetary policy and fiscal policy are linked because money growth in the form of seigniorage provides revenue for the fiscal branch of government. While Sil found very little evidence between fiscal deficits and inflation in the United States, the link was strong in developing countries, which according to him, was due to the method of financing the deficits.

A cross-country macroeconomic analysis of the determinants of inflation in the West African Monetary Zone, using variables such as money supply, interest rate, exchange rates, fiscal deficits and gross domestic product, found that in Nigeria, fiscal deficits, money supply, one year lag of interest rate and exchange rates contributed to inflation (Magbagbeola and Adelokun (2003). The study by Asogu (1991) and Fullerton and Ikhide (1997) depict that inflation is influenced by several factors, including rate of change of money supply, growth rate in real income, exchange rate, and interest rate. Doguwa and Englama (2000) suggest that fiscal deficit financed by the Central Bank creates monetary expansion which eventually drives the general price level in an economy. However, Kiguel and Liviatan (1998) argue that this is only possible in the long run as the relationship is blurred in the short-run. Their argument derives from the study of over 10 countries in which the relationship was found to be influenced by such factors as unstable money demand, exchange rate depreciation, widespread indexation and stubborn expectations in the short run. Onwioduokit (1999), in analyzing the causality between inflation and fiscal deficits, stresses that although fiscal deficit causes inflation, there is no feedback between them. Feedback exists between inflation and inflation deflated by GDP, and it takes about two years for fiscal deficit to impact on inflation in Nigeria. The examination of macroeconomic effects of fiscal deficits in Nigeria by Adam and Bankole (2000) reveals that fiscal deficit and domestic credit have a positive impact on money supply, and that rising prices, import prices and exchange rates reinforce inflation in Nigeria.

Rother (2004) presents panel estimation which suggests that fiscal policies may have an important impact on CPI inflation volatility. Mortaza (2006) argue that money supply and exchange rate have a significant positive influence on inflation. Gutierrez (2005) studied inflation performance and constitutionality of central bank independence in Latin America and the Carribean and concluded that countries with strong independent Central Bank have a better inflation performance.

Dlamini and Nxumalo's (2001) study of Swaziland did not find significant impact of money supply on inflation, suggesting that money supply growth in Swaziland does not accord with normal behavioural expectation towards inflation. Several cross-country studies on the determinants of inflation such as Romer (1993); Campillo and Miron (1997); and Loungani and Swagel (2001) did not even include fiscal balances in their models, implicitly or explicitly assuming that fiscal balances play no role or that their effects are indirectly captured by other variables. From a policy perspective, the results of these studies imply that discretionary fiscal policies could have destabilizing effects on the economy.

3. THEORETICAL CONSIDERATIONS

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

$$Y = C + I + G + (X - M) \quad (1)$$

Where Y represents GDP, C is private consumption, I stands for private investment, G is government consumption, X and M stand for exports and imports respectively. Assuming the aggregate demand A = C + I + G then equation (1) can be rewritten as follows:

$$Y - A = X - M \quad (2)$$

Equation (2) reflects the behaviour of the external account of the economy. The direct interpretation is that, external imbalances always trigger a series of developments in the economy, which in this case is budget deficit. However, any attempt to restore the balance must include effort to align revenue with expenditure.

In order to have the disposable income, we introduce tax and international reserve (the latter is introduced basically on the assumption of the fixed exchange rate regime) into the national income identity. It follows that equation (2) will become:

$$Y + R - T = C + I + (G - T) + (R + X - M) \quad (3)$$

In the following equation, S (savings) is the disposable income minus private consumption. That is:

S = Y + R – T – C, the private absorption is illustrated by (C + I), (G – T) is for budget deficit, while the current account balance CAB is represented by (R + X – M), R represents international transfer receipts and T stands for taxes.

Substituting S and CAB by their respective components, we get:

$$(S - I) + (T - G) = (R + X - M) \quad (4)$$

It is often argued that deficit in the current account occurs when aggregate investment outweighs aggregate savings. However, if investments equals savings and government expenditure is greater than its revenue then, the current account deficit is inevitable. The literature on the current account is quite obvious when it indicates the degree at which the domestic economy interacts with its external assets.

Thus, (X + R – M) is also equivalent to the increase in net official assets plus the rate of capital outflow that is ΔNFA. Hence, CA + ΔNFA (5)

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

$$(S - I) + (T - G) = \Delta NFA \quad (6)$$

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

$$\Delta NFA^{b} = \Delta M_2 - (\Delta DC^{g} + \Delta DC^{nb}) \quad (7)$$

The liability of the banking system is represented by M_2, that is the broad money,

ΔDC^{g} is domestic credit of the banking system to the government and ΔDC^{nb} is the credit of non-banking sector (private sector) to the government.

Equation (7) is the difference between money expansion and credit expansion and, it works as follows. An increase in money relative to credit expansion will reflect as an increase in the net foreign asset. In countries where the capital markets are not advanced (such as Nigeria), budget deficit is usually financed through domestic and external borrowing. This expression can be simplified as follows:

$$G - T = \Delta DC^{g} - \Delta NFA^{g} \quad (8)$$

Substituting (8) into (7), gives us the relationship between the financing of the budget deficit and the banking system thus:

$$G - T = \Delta M_2 - \Delta DC^{nb} - (\Delta NFA^{b} + NFA^{g}) \quad (9)$$

Equation (9) illustrates the sources through which government deficit can be financed. First, by an increase in money (ΔM_2); second, borrowing from non-banking sector; and lastly, by a reduction in international reserve or external borrowing. In all, increased budget deficit will translate into increased current account deficit and then precipitate new external borrowing. However, all

the three means of financing may lead to appreciation of real and nominal exchange rate in the case of flexible exchange rate and capital mobility.

The specification of the model mirrors the works of Romer (1993), Akcay, Alper and Ozmucur (1996), Catão and Terrones (2003), Magbabeola and Adelokun (2003), Perrotti (2004) and Lane (1995). The inflation-fiscal deficit model is specified as:

$INF = f(MS, FD, INF_{t-1}, GDP, EXDEP)$

Hence the inflation equation becomes:

$$INF = a_0 + a_1 FD + a_2 MS + a_3 INF_{t-1} + a_4 GDP_t + a_4 EXDEP_t + U_t \quad (10)$$

A priori we expect $a_1, a_2, a_3, a_5 > 0$; $a_4 > 0$ or $a_4 < 0$

Where a_o is the intercept and,a_1, a_2, a_3, a_4, a_5 are the coefficients of the regression equation; INF, Inflation Rate, represents the dependent variable; while the independent variables are: Fiscal deficits (FD), Money Supply (MS), Gross Domestic Product (GDP), Exchange rate Depreciation (EXDEP), and U_t is the error term which captures the impact of the government economic reform programmes on the economy. The inclusion of exchange rate depreciation stems from the works of Romer (1993) and Lane (1995). They argue that the benefits of an expansionary monetary policy tend to be small in an economy because (1) the weight of the domestic goods sector will be smaller implying that the impact of monetary expansion on domestic employment will reduce, and (ii) the currency depreciation resulting from the monetary expansion will raise domestic inflation more than in a closed economy. Hence the higher the depreciation rate, the higher the relationship between exchange rate depreciation and inflation. The study data covers 37 years over 1970-2006. Data source is the Statistical Bulletin of the Central Bank of Nigeria, December 2007.

3.1 Estimation Technique – Cointegration and Error Correction Model (ECM) Estimation Technique

We investigated the time series characteristics of the data to test whether the variables are integrated. The Augmented Dickey-Fuller (ADF), as specified in Dickey and Fuller (1979), and Phillips-Perron (Phillips and Peron, 1988) was employed. For the ADF, the null hypothesis is that the variable being considered has a unit root against an alternative that it does not. The model for the ADF is as specified below:

$$\Delta y_t = \alpha + \beta T + \gamma y_{t-1} + \sum_{i=1}^{P} d_t \Delta y_{t-1} + \varepsilon_t \quad (11)$$

Where y_t is the variable being considered, T is the time trend (which is only allowed if significant), and ε_t is a random error term. The Akaike Information Criterion is used in selecting p (the lag-length) after testing for first and higher order serial correlation in the residuals. The lagged variables serve as a correction mechanism for possible serial correlation. The Phillips-Peron (PP) test uses models similar to the Dickey-Fuller tests but with Newey and West (1994) non-parametric correction for correcting possible serial correlation rather than the lagged variables method employed in ADF. Also Bartlett Kernel (Andrews, 1991) is used as an automated bandwidth estimator for lag truncation of the Newey and West nonparametric correction. The test statistics of the PP have the same distribution as those of Dickey-Fuller with critical levels as provided by MacKinnon (1996).

The fact that two series are unit roots can be an indication of a long run relationship between the two series. To test for the long run relationships between the variables, we apply the Engle-Granger (1987) two step cointegration test which uses the residuals from the long run equation estimated with the non-stationary variables, and then test for the existence of unit root in the residual using the ADF regression and compare the value to an appropriate asymptotic null distribution. The cointegration term is known as the *error correction* term since the deviation from long-run equilibrium is corrected gradually through a series of partial short-run adjustments. The cointegrating vectors from which the error-correction terms are derived are each indicating an independent direction where a stable, meaningful long-run equilibrium state exists. The coefficients of the error-correction terms, however, represent the proportion by which the long run disequilibrium in the dependent variables is corrected in each short-term period.

3.2 Structural Analysis – Impulse Response Analysis and Forecast Error Variance Decomposition

A shock to any variable in the Vector Error Correction (VEC) model not only directly affects the variable but is also transmitted to all of the other endogenous variables through the dynamic (lag) structure of the VEC. An impulse response function traces the effect of a one-time shock to one of the innovations on current and future values of the endogenous variables. While impulse response functions trace the effects of a shock to one endogenous variable on to the other variables in the VEC, variance decomposition separates the variation in an endogenous variable into the component shocks to the VEC. Thus, the variance decomposition provides information about the relative importance of each random innovation in affecting the variables in the VEC. The general form of the vector error correction model (VECM) for equation (10) is therefore expressed as:

$$Ln\Delta INF_t = \sum_{k=1}^{r} \alpha_{1,k} v_{k,t-p} + \sum_{s=1}^{p} \phi_{1,s} Ln\Delta FD_t + \sum_{s=1}^{p} \phi_{2,s} Ln\Delta MS_{t-s} + \sum_{s=1}^{p} \phi_{3,s} Ln\Delta GDP_{t-s} + \sum_{s=1}^{p} \phi_{4,s} LN\Delta EXDP_{t-s} + \sum_{s=1}^{p} \phi_{5,s} LnINF_{t-1} + \mu_t \quad (12)$$

where: p . $\tilde{l}_1$ (is the optimal lag length of the VAR)
$\alpha_{i,k}$ = the adjustment coefficients
$v_{k,t-p}$ = is the cointegrating vector
μ_i = intercepts

4. ECONOMETRIC RESULTS

The characteristics of the data series used in the regression analysis are presented in Table 2. The table reports the summary descriptive statistics used in the analysis. The mean value of log of inflation was 1.198 while the mean of the log of fiscal deficit was 0.111.

Table 2
Summary of Statistics of Variables Applied in the Regression Analysis

	Mean	Median	Maximum	Minimum	Std.Dev.	Obs
LEXDEP	22.75231	4.351496	321.9044	-9.47501	59.28653	36
LGDP	11.12829	11.09621	11.3797	10.89509	0.12569	37
LFD	0.111193	0.066115	0.50274	-0.37609	0.182012	37
LINF	1.198114	1.147584	1.862203	0.538775	0.326202	37
LMS	10.7536	10.5844	12.42014	8.990916	1.059701	37

The variables for the analysis were subjected to two types of unit roots test to determine whether they are unit roots or stationary series. The tests employed were the Augmented Dickey Fuller test (ADF) and the Phillips-Perron (PP) test. For the ADF and PP tests, two models are considered viz, with constant, with time trend. The null in both the ADF and PP test is the presence of unit root. The ADF results in Table 3 show that 99% of the variables are integrated of order one in the two models of unit root test considered. Only one variable was found to be significant at its level and other variables were at the 5% level. One exception, EXDEP was however observable. The EXDEP variable was found to be stationary and significant at 5% level in the model that includes a constant and a linear time trend at levels but insignificant in the model that includes only a constant. One interesting feature noted in the results was that all the variables were stationary in model with constant as well as constant and linear time trend at the first difference level.

Table 3
Table of the Observed Result of the Augmented Dickey Fuller Test*

Variables	Level		First difference	
	Model 1	Model 2	Model 1	Model 2
LEXDEP	-5.485	-5.54716	-9.44019	-9.31101
LFD	-3.20642	-4.67947	-5.84943	-5.86981
LGDP	-0.71521	-1.82668	-5.97603	-5.92072
LINF	-3.54217	-3.52697	-6.36578	-6.30673
LMS	-1.34321	-2.44379	-3.38974	-3.40472

*The Null Hypothesis is the presence of unit root. Model 1 includes a constant while Model 2 includes a constant and a linear time trend. Lags were selected based on Schwarz Information Criterion. *, **, *** indicate significance at 1%, 5%, and 10%, respectively.

Table 4
Table of the Observed Result of the Phillips-Perron Test (PP)*

Variables	Level		First difference	
	Model 1	Model 2	Model 1	Model 2
LEXDEP	-5.48394	-5.53421	-27.3077	-32.2452
LFD	-3.17008	-4.54522	-13.1983	-14.133
LGDP	-0.78224	-2.17373	-5.98407	-5.92585
LINF	-3.29075	-3.27206	-13.7516	-13.3734
LMS	-0.78309	-1.90896	-3.42703	-3.42266

*The Null Hypothesis is the presence of unit root. Model 1 includes a constant. Model 2 includes a constant and a linear time trend. The Bandwidth was chosen using Newey-West method with Barttlet Kernel spectral estimation. *, **, *** indicate significance at 1%, 5%, and 10%, respectively.

The PP test statistics reported in Table 5 reinforces the result in the model that includes only constant in the ADF test and also supports those models that include a constant and a linear time trend. The PP test supports the presence of unit roots in nearly all the series. However, a few exceptions that were noticed in the ADF model remain. EXDEP was found to be stationary and significant at 5% level in the model that includes a constant and a linear time trend, but insignificant in the model that includes only a constant. It is evident from Tables 3 and 4 that the variables become stationary series when appropriately differenced. From the two types of integration tests carried out (above), it may be concluded that all the variables in our models contain unit roots. Therefore, we can safely proceed to use the co-integration method in analyzing the models as conventional regression models will generate spurious results due to the integration level of the series. Following the findings that the data series are by nature, mostly non-stationary stochastic processes, econometric developments regarding the concepts of cointegration are particularly apposite in testing for equilibrium. Accordingly, the long run properties of the variables in the behavioural equations were examined using the Engle-Granger two-step procedure.

Table 5
Table of Observed Result of the Unit Root Test of Residual of ECM Variables

Equation	Augmented Dickey Fuller test	Phillips-perron test
Inflation Equation	-4.3512	-4.3581

*Note: (1) Lags were selected based on Schwarz Information Criterion in the ADF test. (2) The Bandwidth was chosen using Newey-West method with Barttlet Kernel spectral estimation in the Phillip-Perron test. (3) *, **, *** indicate significance at 1%, 5%, and 10%, respectively.

The result of the unit root tests of the residuals of the static long-run models is presented in Table 5. The regression residuals have zero mean and, as they are not expected to have deterministic trend, the unit roots exercise was conducted by excluding both the models that include constant and constant with time trend. The ADF test statistics and the Phillip-Perron statistics suggest that the disequilibrium errors are mostly I(0), and as such, the variables in the static equations are cointegrated.

Table 6
Table of Observed Result for the Johansen Multivariate Cointegration Test Results for the Inflation Equation

Sample(adjusted): 1973-2006

Included observations: 34 after adjusting endpoints

Trend assumption: Linear deterministic trend (restricted)

Series: LINF LFD LMS LGDP EXDEP

Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test

Hypothesized		Trace	5 Percent	1 Percent
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Critical Value
None **	0.784307	105.4311	87.31	96.58
At most 1	0.471063	53.27858	62.99	70.05
At most 2	0.45628	31.62449	42.44	48.45
At most 3	0.184418	10.90758	25.32	30.45
At most 4	0.110377	3.976573	12.25	16.26

***(**) denotes rejection of the hypothesis at the 5%(1%) level**

Trace test indicates 1 cointegrating equation(s) at both 5% and 1% levels

Hypothesized		Max-Eigen	5 Percent	1 Percent
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Critical Value
None **	0.784307	52.15251	37.52	42.36
At most 1	0.471063	21.6541	31.46	36.65
At most 2	0.45628	20.71691	25.54	30.34
At most 3	0.184418	6.931004	18.96	23.65
At most 4	0.110377	3.976573	12.25	16.26

***(**) denotes rejection of the hypothesis at the 5%(1%) level**

Max-Eigen value test indicates 1 cointegrating equation(s) at both 5% and 1% levels

In view of the problems with the Engle-Granger framework for testing cointegration, the results were validated using the Johansen (1991, 1995) approach. The Johansen's framework provides the number of cointegrating equations and estimates of all cointegrating vectors in the multivariate case. The Johansen cointegration test results are presented in Table 6 above. The trace test and the max-Eigen test were conducted to establish the number of cointegrating relations in each of the equations. The trace test results are presented in the first part of the table while the max-Eigen results are presented in the second part of the table. Test results indicate the existence of one cointegrating equation in the equations at the 1% and 5% significance levels. In addition, the normalized cointegrating coefficients show that the variables in the equations are relatively important. The consistency in the test results confirms the existence of long-run relationship among the exogenous and dependent variables in the model.

As the data series are non-stationary and the vector of variables in the equations appears to be cointegrated, execution of the second phase of the Engle-Granger technique leads to the estimation of error-correction forms of the stochastic equation. The equation represents the short-run behaviour and the adjustment to the long-run model. The residual from the cointegrating regression lagged one period was used as error correction mechanism in the dynamic equation. The Ordinary Least Squares (OLS) estimation method is used as it is an essential component of most other estimation techniques. In addition, the OLS remains one of the most commonly used methods in econometric investigations involving large models. Estimates of the preferred specification obtained using general-to-specific method are presented in Table 7 and discussed below. The results are evaluated using conventional diagnostic tests.

The general discussion of the error correction model is useful here. All the diagnostic test statistics are quite satisfactory. The magnitude of the coefficients confirms the absence of redundant regressors. Judged by the significance of the t-statistics, the coefficients are well determined. The disequilibrium error term, ECM_{t-1}, is statistically significant and negative (as expected) in the equation. The significance of the error terms confirms the existence of long-run relationship between the variables in the error correction model. Of particular interest is the coefficient on the lagged ECM in the inflation equation. The ECM induces about 93% adjustment per period in this equation. In addition, the equation is statistically significant and the overall statistical fit is good. The marginal significance level of the F-statistics is zero. Hence, the null hypothesis of the F-statistics is rejected at all specified significance levels. Therefore, the conclusion is that, as groups, the regression coefficients are significantly different from zero. The high value of the Durbin-Watson (DW) indicates absence of autocorrelation. Finally, the relatively low value of the standard error of the regression is a clear evidence of the goodness of fit of the equation.

Table 7
Parsimonious Model of Inflation Equation

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.032964	0.101117	-0.325998	0.7482
D(LFD)	0.233926	0.265936	0.879633	0.5907
D(LFD(-1))	-0.779860	0.310768	-2.509456	0.0219
D(LFD(-2))	-0.341655	0.244115	-1.399566	0.1786
D(LFD(-3))	-0.282034	0.240535	-1.172529	0.2563
D(LMS(-1))	2.492634	0.666969	3.737256	0.0015
D(LMS(-2))	-2.193341	0.818169	-2.680793	0.0153
D(LGDP)	-3.692967	1.717697	-2.149952	0.0454
D(LGDP(-3))	5.921697	1.726547	3.429792	0.0030
D(EXDEP)	-0.02052	0.000573	-3.580165	0.0021
D(EXDEP(-1))	-0.06271	0.000687	-0.912839	0.3734
D(LINF(-1))	0.769617	0.271060	2.839290	0.0109
D(LINF(-2))	-0.220215	0.139902	-1.574066	0.1329
D(LINF(-3))	0.213160	0.156862	1.358896	0.1910
ECM1(-1)	-0.931899	0.326746	-2.852055	0.0106
R-squared	0.840412	Mean dependent var		0.014004
Adjusted R-squared	0.716287	S.D. dependent var		0.336903
S.E. of regression	0.179451	Akaike info criterion		-0.294879
Sum squared resid	0.579645	Schwarz criterion		0.385352
Log likelihood	19.86550	Durbin-Watson Stat.		1.958137
F-statistic	0.000133			

Dependent Variable: D(LINF)

The results of the inflation equation in Table 7 are insightful. First, the table shows that even though the relationship is positive, fiscal deficit appears not to be a statistically significant driver of inflation in Nigeria. Second, the results indicate that past levels of fiscal deficits do not seem to play any significant role with respect to inflation in Nigeria. Taken together, they point to the violation of the theory in Nigeria. These results are consistent with Click (1998) who found that fiscal variables play no significant role in fuelling inflation. However, the argument of Roland (1982) that fiscal deficit-inflation relationship depends to a greater extent on the method used to finance the deficit is upheld in this empirical result. The results also corroborate the assertion by Catão and Terrones (2001) that the relationship between fiscal deficits and inflation tends to be less obvious in countries with strong institutional arrangements that curb fiscal dominance. In Nigeria, there is a consistent effort to curtail the incidence of fiscal dominance through a range of Central Bank's monetary policies.

The results also provide evidence of a positive long run-relationship between money supply and inflation in the Nigerian economy over the study period. This corroborates the findings of Islam and Wetzel (1991), Schmidt-Weztel (1993) and Njeru and Randa (1998), Magbagbeola and Adelokun (2003) and WAIFEM (2001). The estimation result (Table 6) suggests that a 1% increase in money supply leads to 2.49% increase in inflation in Nigeria. Exchange rate depreciation is however not found to have significant positive effect on inflation in Nigeria. Furthermore, GDP is found to be negatively related to inflation in Nigeria, indicating that output is negatively correlated with inflation during the study period. Also, the immediate past level of inflation is found to drive the current level of inflation in Nigeria. The strength of the effect of the immediate past year's inflation on the present period in Nigeria is dynamic, positive and significant. The error correction estimate of 0.931 indicates that 93.1% of the preceding period's disequilibrium is eliminated in the current period, with intermediate adjustments captured by differenced terms. The value of the adjusted R^2 shows that the model accounts for at least 71.6% changes in inflation.

4.1 Impulse Response Analysis and Forecast Variance Decomposition

Figure 1 shows that money supply and exchange rate depreciation have the highest shock impact on inflation among the variables in the inflation system. The effect of the money supply impulses is positive on inflation, making its full impact on the fourth period. The result of the variance decomposition estimates of inflation in Table 8 indicates that money supply shocks explain about 31.91% of the variation in inflation in the 10th period. This is followed by exchange rate depreciation which explains about 4.69% changes in inflation during the same period. However, about 0.72% of the future changes in inflation are attributable to changes in fiscal deficits, while about 61.57% of future changes in inflation are explained by present inflation.

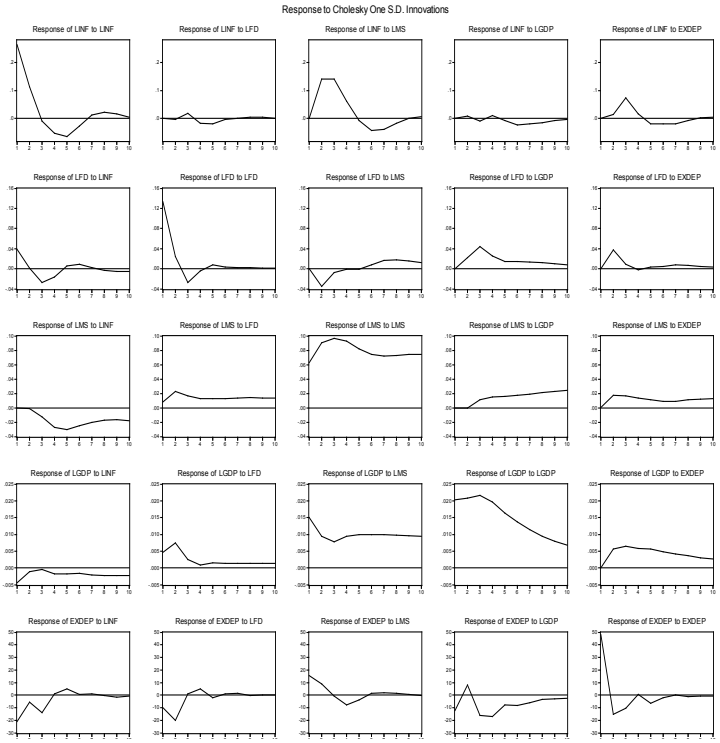

Figure 1
Impulse Response Graph

Figure 1: Accumulated impulse response functions for the Inflation equation. Money supply and exchange rate depreciation impact the highest shock on inflation among the other variables making its full impact from the first period to the fifth period. Fiscal deficit only has positive effect on inflation between the second and the third period. Thereafter it generates negative effects over the third and sixth period.

Table 8
Variance Decomposition of the Inflation Equation

Period	S.E.	LINF	LFD	LMS	LGDP	EXDEP
1	0.262555	100	0	0	0	0
2	0.318938	80.43813	0.016211	19.29863	0.054857	0.192168
3	0.356797	64.36306	0.280937	30.97723	0.111756	4.267021
4	0.366744	63.03269	0.479999	32.05632	0.189739	4.241256
5	0.373724	63.77814	0.73143	30.91064	0.223791	4.356004
6	0.378459	62.69021	0.720614	31.44376	0.628224	4.517193
7	0.381787	61.69779	0.708452	32.00362	0.904603	4.685535
8	0.383145	61.56498	0.712432	31.97321	1.05596	4.69342
9	0.383588	61.5909	0.719461	31.9	1.103292	4.686348
10	0.383696	61.57236	0.719055	31.9096	1.108587	4.690388

SUMMARY AND CONCLUSION

There is a long held view in macroeconomics about the causative relationship between fiscal deficits and inflation. However, the empirical exploration of this relationship in Nigeria remains inchoate. This paper has sought to determine the effect of fiscal deficits on inflation in Nigeria during the period, 1970-2006. After establishing the unit root status of the variables in the structural equation and the existence of cointegration, the Ordinary Least squares (OLS) two stage approach as suggested by Engle-Granger (1987) was utilized in deriving the long run and short run estimates. The structural analysis was done using the Impulse Response Analysis and Forecast Error Variance Decomposition to trace the one-time shock to one of the innovations on current and future values of the endogenous variables.

Empirical evidence emerges that there is a positive but insignificant relationship between inflation and fiscal deficits in Nigeria. In addition, past levels of fiscal deficits do not have any positive and significant role to play with respect to inflation in Nigeria. Further evidence shows that there is a positive long run relationship between money supply and inflation in the Nigerian economy over the study period indicating that money supply was procyclical, growing at a faster rate than the growth of inflation. Significantly, a 1% increase in money supply leads to 2.4% increase in inflation. Government's fiscal stance is central in liquidity and inflation management in Nigeria, as the study found that the monetary financing of fiscal deficits accentuates the problem of inflation in Nigeria, the need to sustain and deepen current efforts aimed at fiscal discipline, due process and implementation of the fiscal responsibility law cannot therefore be overemphasized. What government does by way of policy choice has serious implications for the way the economy responds to shock. Accordingly, a credible programme of fiscal deficit reduction that would keep government spending at sustainable limits is imperative.

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