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Impact of Inflation on Monetary Policy and Economic Development in Nigerian, 1980-2010. Evidence from Empirical Data

Abiola Adeola Kumapayi (School of Post Graduate Studies Nigerian Defence Academy, Kaduna)

Joseph Ufuoma Nana (Department of Accountancy Delta State Polytechnic, Oghara)

Bright Onoriode Ohwofasa (Department of Arts and Social Sciences School of General Studies Delta State Polytechnic, Oghara)

Author (s)

Abiola Adeola Kumapayi
School of Post Graduate Studies
Nigerian Defence Academy, Kaduna
E.mail:adeolakumapayi@yahoo.com

Joseph Ufuoma Nana
Department of Accountancy
Delta State Polytechnic, Oghara
E.mail:ujnana2000@yahoo.com

Bright Onoriode Ohwofasa
Department of Arts and Social Sciences
School of General Studies
Delta State Polytechnic, Oghara
E.mail:brightohwofasa@yahoo.com

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Abstract

The study explores the efficacy in the effective operation of monetary policy in Nigeria with emphasis in inflation. A number of monetary variables which include domestic credit, interest rate, exchange rate and broad money supply were employed for the study. Additionally, fiscal deficit and trade openness were included as a function of inflation in Nigeria. Again, to assess the impact of inflation on the country's growth rate, domestic credit and money supply were added to inflation as determinants of economic growth. A simple linear regression was adopted for the study and results reveal that domestic credit, fiscal deficit and a one year lag of inflation are statistically significant in explaining inflation in Nigeria. On the relationship between inflation and the explanatory variables: fiscal deficit, money supply and interest rate have a positive correlation with inflation while exchange rate, trade openness and past level of inflation have a negative impact on inflation. The findings also reveal that impact of inflation on economic growth is negative while that of money supply and domestic credit is positive. The study recommends, among other things, that since impact of inflation on economic growth is negative, policy measures aimed at curtailing such impact should include targeting of less than double digit inflation through effective monetary policy and increase in output and productivity through effective agriculture and full capacity utilization in manufacturing sector.

Introduction

The objectives of monetary and fiscal policies in Nigeria are wide-ranging. These include increase in gross domestic product growth rate, reduction in the rates of inflation and unemployment, improvement in the balance of payments, accumulation of financial savings and external reserves as well as stability in the Naira exchange rate. The policy as well as instruments applied to attain these objectives have until recently been far from adequate with undue reliance placed on fiscal policy rather than monetary policy in Nigeria (Darrat, 1984). A highly volatile rate of inflation has the potential to do great economic harm. With nominal contracts, uncertainly about future prices is likely to entail higher risk premia and unanticipated changes in the distribution of wealth (Fielding, 2008). These costs mean that

for a given average inflation rate, higher inflation volatility can depress economic growth (Elder, 2004; Fatas and Mihov, 2005; Grier and Grier, 2006). According to Olubusoye and Oyaromade (2008), monetary policy in Nigeria over the past three decades has intended to attain price and exchange rate stability. Despite the apparent continuity in this objective, Nigeria's inflation experience since 1970 has been mixed. The oil boom of the 1970s engendered by the Middle East crisis raised the revenues accruing to government from this non-renewable resource by a remarkable level.

Government expenditures gathered momentum in the wake of the determination of the authorities to accelerate post-war reconstruction

and development as envisaged in the Second National Development Plan. This time, however, the engine of finance became the massive oil revenue, which has been singularly significant since 1973. From N510 Million in 1973, the country's export earnings from oil increased phenomenally to N1,894 billion three years later in 1973 and soared to an astronomical N5,318 billion or 92 percent of total exports in 1974. Addition to this was the rapid growth in domestic money supply, exacerbated by the monetization of the earnings from oil. This exerted upward pressure on the general price level. Between 1992 and 1999, Nigeria's real gross domestic product (GDP) grew at an average of about 2.6 percent which is far short of propelling the economy into sustainable development. Inflation in the early 1990s was exceptionally high at 45, 57 and 72 percents in 1992, 1993 and 1995 respectively. However, the late 1990s witnessed a sharp reduction in the rate of inflation. For example, inflation rate fell to 10.7, 7.9 and 6.6 percent in 1997, 1998 and 1999 respectively. The figure rose reaching 6.9 percent in 2000 and 18.9 percent in 2001. It witnessed series of fluctuations within the last decade recording 13.3 percent in 2010. It is in the context of sustaining the low inflation rate of the late 1990s that the present research on modeling the inflation process in Nigeria becomes germane.

In terms of economic history, Nigeria has indeed come a long way. Since political independence in 1960, the country has suffered from civil strife and 'stop-go' economic policies which have resulted in high inflation and serious macroeconomic instability. Understanding the sources of the instability is an important challenge to empirical macroeconomists and policymakers. The reason for this challenge is related to the vast wealth of natural resources available in the country and particularly crude oil and natural gas whose huge export revenue has driven the Nigerian economy since the 1970s, yet the economy has not experienced substantial growth and development (Omotor, 2008). One of the key monetary policies of the Nigerian government is to target a low or moderate inflation rate. This is because inflation causes excessive relative price variability and misallocation of resources. It reduces real income of labour where nominal wages are without escalator clauses.

Over the last few decades, high inflation in Nigeria has caused yield on investment to decline while government policy objectives is adversely affected as the real size of its budget shrinks with rising inflation which has hampered economic growth. In order to find solution to these problems, several empirical studies have been documented in the literature; see for example Odusola and Akinlo (2001), Omotor (2008), Emmanuel (2000) among others. The bulk of empirical works on this field of study have concentrated on stating gross domestic product, exchange rate, domestic credit and money supply (M2) as the causes of inflation in Nigeria. However, impact of fiscal deficit, lag value of inflation, interest rate and trade openness are also very important in Nigeria inflation targeting. We are therefore not aware of any studies that have incorporated these variables in the literature. Thus, as part of our attempt to fill the lacuna, this study examined the quantitative effects of inflation rate dynamics in Nigeria with regards to its determinants as well as impact of inflation on economic development in the country's drive towards inflation targeting.

The objectives of the paper therefore are two folds namely: to establish the determinants of inflation as a prelude to inflation targeting in Nigeria. The relationship between inflation and economic development is also scrutinized. The rest of the paper is structured as follows. Section two deals with related literature review. In section three, the method of study is unveiled. Section four covers results and findings of the study. Finally, section five concludes and makes policy recommendations.

Conceptual Literature Review

Historically, the Origin of the current inflation dates back to the 1970s, when the revenue accruing to the government from the non-renewable oil resource rose steeply. With the increase in public expenditure, enhanced by oil resources there was vast expansion in aggregate demand. With the inelastic supply of domestic output, inflation inevitably resulted. The rapid growth in money supply as a result of the monetization of the earnings from oil also

exerted upward pressure on the general price level (Egwaikhide et. al, 1994). During the first half of the 1980s, the price of crude oil slumped in the world market and so Nigeria's crude oil which sold at slightly above US$41 per barrel in early 1981 fell precipitously to less than US$9 by August, 1986. This triggered a series of developments in the economy. One example is the state's fiscal crises, as reflected in the persistent and substantial budget deficit which cumulated to approximately ₦17.4 billion in the five years between 1980 and 1984.

Monetary policy became highly expansionary as a large part of the deficits incurred during this period were financed through the creation of credit. Indeed, the total domestic credit to the economy recorded an annual average growth rate of 29.9 percent in 1980-84 and most of the increase was attributable to net claims by the government (Egwaikhide et al, 1994). Simultaneously, two digits inflation at a yearly mean rate of 20.2 percent was registered, a clear evidence perhaps in support of the monetarist postulation. However, in 1984 inflation which stood at almost 40 percent is often explained in terms of acute shortages of imported goods and services imposed by inadequate foreign exchange earnings, a derivative of the steep fall in crude oil prices.

With the deepening internal and external disequilibria, it became imperative to adopt the structural adjustment programme (SAP) in 1986. The SAP, which is predicated mainly on the principle of 'getting prices right' has exchange rate reform as its central focus. In pursuit of this, the Second-Tier Foreign Exchange Market (SFEM) was introduced in late September, 1986 and since then the Naira has depreciated sharply against the US Dollar and other major currencies. Quantitatively, the naira which traded at ₦4.62 : $1.00 at the inception of SFEM in late September 1986, had, by end of 1989 exceeded ₦7.65 : $1.00, a change of almost 65.6 percent. During the same period, inflation jumped from barely 5.0 percent to almost 41 percent.

This development shows that the depreciation of the naira has a role to play in Nigeria's recent inflationary process. Concomitant with this is the substantial budget deficit operated annually by the Federal Government in the last two decades or so. Part of the budget deficit is financed through Bank Credit, which directly affects the money base. This also exerts upward pressure on the general price level. All these suggest that there are many sources of the current inflation. While the channels through which exchange rate depreciation and other macro variables that are employed in this study affect prices are well known and documented in the literature the extent to which this phenomenon engender price inflation in Nigeria is still not adequately researched. The study therefore intends to compliment earlier studies in this field of monetary economics by undertaking a detail investigation on the determinants of inflation as a key variable in monetary policy and impact of inflation on economic development.

Theoretical Literature
A vast array of approaches to the explanation of inflation exists in the literature. According to the monetarist or neo-Fisherian approaches to inflation, they seek to ascribe observed rates of inflation in different countries to the respective growth rates of money supply per unit of the national product. This school of thought believes that inflation is mainly a monetary phenomenon. However, this may not be totally true of the Nigerian situation as there are other factors responsible for inflation in the country.

The Economic and Financial Review of the CBN (1997) argued that inflation in Nigeria moves with a lag with fluctuations in money supply. Thus, between 1970 and 1981, peaks in growth of broad money were associated with double digits inflation and that since 1984 to date; the rate of inflation has grown faster than that of growth in money supply. This trend suggests that although growth in money supply may be significant in explaining inflation in Nigerian, it is not the only factor. Additionally, the **monetarists' argument** was advanced by Friedman (1956, 1960, and 1971). To him, changes in money supply have been seen to cause changes in price. It follows, therefore, that an increase in money supply is likely to cause an increase in prices and hence inflation.
The structuralist economists argued that inflation may not be the outcome of excess demand, high and rising costs or the willful

desire of businessmen to earn more profits by raising the prices of their products but the manifestation of structural rigidities in the system when supply create bottlenecks as there are shortages and persistence fiscal deficit. Some of these structural factors (managerial, technological and infrastructural deficiencies and climatic changes) are themselves reflection of the state of the economy's under development (Emmanuel, 2000).

There are also those who believe in **cost push** as the main cause of inflation. The cost-push views attribute inflation to a host of non-monetary supply-oriented influences of shocks that raise costs and consequently prices. In the earlier views of the cost pushers, inflation was attributed to: union wage pressure, monopoly pricing policies; competitive struggle for relative income shares; labour and capital immobility and job information deficiencies (Bowen, 1965). However, in recent times, this school of thought has attributed inflation to such random non-monetary shocks such as crop failure, commodity shortages and increase in the price of oil (Humphery, 1986).

Governments resort to money creation to finance its expenditure increases the nominal stock of money and consequently increases demand for goods and services. If output does not grow in tandem to meet this increase in demand, an upward pressure on prices will result (Onwioduokit, 1997). In synopsis, inflation would result from increased government deficit which is financed by money creation. In most developing countries, including Nigeria, poor and inadequate tax programmes make government unable to generate enough funds for expenditures, hence, the pursuance of the policy of financing government expenditures by creation of money becomes inevitable.

Empirical Literature
Adebiyi (2006), investigated whether or not one of the preconditions for a successful inflation-targeting framework is present in Nigeria and Ghana. Monetary variables of narrow money supply (M1), consumer price index (CPI), nominal exchange rate (ER), and interest rates on 3 months' time deposits (DR) were used and employing a VAR approach, the study

discovered that inflation is an inertial phenomenon in Nigeria and Ghana, and money innovations are not strong and statistically significant in determining prices when compared with price shocks themselves. The study concluded that policy linkage between inflation and monetary policy instruments in Nigeria and Ghana is not strong and predictable in the short run and thus, both countries are not yet candidates for inflation targeting. Chuku (2009) carried out a controlled experiment using a structural vector autoregressive (SVAR) model to trace the effects of monetary policy shocks on output and prices in Nigeria.

The study employed broad money (M2), Minimum Rediscount Rate (MRR) and the real effective exchange rate (REER) and found evidence that monetary policy innovations carried out on the quantity-based nominal anchor (M2) has modest effects on output and prices with a very fast speed of adjustment. While, innovations on the price-based nominal anchors (MRR and REER) have neutral and fleeting effects on output and concluded that the manipulation of the quantity of money (M2) in the economy is the most influential instrument for monetary policy implementation.

Emmanuel (2000) examined the impact of monetary policies on inflation in Nigeria for the period of 1980 – 1995. The variables employed in the study were domestic credit, exchange rate, gross domestic product and money supply (M2). Applying the ordinary least squares (OLS) technique, the findings showed that exchange rate and M2 had a negative impact on inflation, however, while exchange rate was significant in explaining inflation for the period M2 was not. On the other hand, both domestic credit and gross domestic product were positively significant in explaining inflation in Nigeria. Terlumun (2004) investigated the relationship between price volatility, expectations and monetary policy in Nigeria. The study applied the maximum likelihood estimator, and the generalized autoregressive conditional heteroscedasticity (GARCH) model to estimate the steady state model of inflation. The Gauss-Siedel algorithm was applied for forward- looking expectations with actual inflation series as start values. The study found that inflation expectation and price volatility

not only influenced the contemporaneous inflation, it also resulted in persistence interest rate differential and monetary growth, thus compromising the objective of monetary policy.

Nwafor et al. (2007) examined the stability of money demand for Nigeria using vector autoregressive approach. Their results confirmed a stable money demand function for Nigeria. Akinlo (2006) using an autoregressive distributed lag (ARDL) technique combined with CUSUM and CUSUMQ tests, examined the cointegrating property and stability of M2 demand in Nigeria. The results show M2 to be cointegrated with income, interest rate and exchange rate. The CUSUM test weakly reported a stable money demand for Nigeria. Omotor (2009) also applied the ARDL technique and equally found a stable money demand for Nigeria. Similarly, in another study on monetary policy in Nigeria, Omotor and Omotor (2010), estimated an endogenous structural break date. Using the Gregory and Hansen procedure, an endogenous break date of 1994 was estimated for the cointegrating equation of the demand for money. The study affirmed a stable money demand function for Nigeria and concluded that the Central Bank of Nigeria (CBN) has effectively used money supply as monetary policy instrument.

Feridun (2005), studied impact of monetary policy on economic instability in Turkey from 1983 – 2003 and based on quarterly data, the study affirmed that the efforts of the Turkey monetary policy at influencing the finance of government fiscal deficit through the determination of the inflation- tax rate, affected to some extent, the rate of inflation and the real exchange rate thereby causing volatility in their rate. Egwaikhide and Udoh (2008), in their studies found that exchange rate volatility and inflation uncertainty exerted significant negative effect on foreign direct investment. The study employed the popular GARCH methodology usually for the study of volatility. The studies by Fielding (2008), Olubusoye and Oyaromade (2008) showed that efforts of the monetary regulating authorities to stabilize the domestic prices would continuously be disrupted by volatility in the international price of crude oil.

Nigeria's Inflation Experience

Nigeria has experienced all manner of inflationary episodes – from creeping to moderate and from high to galloping (see Table 2.1 and 2.2). Average inflation during the period 1980 - 1994 was relatively high, the historical average rates being 20.5, 25.4 and 35.8 percent for the periods 1980-84, 1985-89 and 1990-94 respectively. When assessed on an annual basis, however, rising prices became a cause for concern for the then civilian and military governments and extending to the current civilian dispensation as inflation rate has almost consistently remains a double digits with exception of 1982, 1985/86, 1990, 1999/2000 and 2006/2007 (see table 2.1).

Table-2.1: Growth Rate of some Macroeconomic Variables (%)

Year	Inflation Rate	Exchange Rate	GDP	Domestic Credit	Interest Rate	Broad Money Supply (M2)	Narrow Money Supply (M1)
1980	10.0	0.55	8.0	25.8	6.0	47.7	51.9
1981	21.4	0.61	55.5	50.0	6.0	7.0	2.7
1982	7.2	0.67	-2.7	37.5	7.5	12.0	3.8
1983	23.2	0.72	-7.1	28.8	7.5	15.4	11.9
1984	40.7	0.76	-1.1	11.6	9.5	11.9	8.5
1985	4.7	0.89	9.5	7.6	9.5	12.4	11.0
1986	5.4	2.02	-2.5	9.9	9.5	4.2	-2.3
1987	10.2	4.02	-0.6	16.5	15.3	22.9	12.1
1988	56.0	5.54	7.4	24.2	12.1	35.0	46.3
1989	50.5	7.39	7.7	-32.5	12.6	3.5	18.2
1990	7.5	8.04	13.0	57.3	20.5	45.9	49.1
1991	12.7	9.91	-0.8	40.4	17.1	27.4	27.9
1992	44.8	17.3	2.3	109.4	22.3	47.5	51.4
1993	57.2	22.05	1.3	64.1	23.3	53.8	56.3
1994	57.0	21.87	0.2	56.4	15.0	34.5	42.6
1995	72.8	21.89	2.2	8.0	13.7	19.4	18.9
1996	29.3	21.89	4.4	-21.8	13.2	16.2	12.9
1997	10.7	21.89	2.8	-1.4	7.5	16.0	18.1
1998	7.9	21.89	2.9	40.1	10.5	22.3	18.6
1999	6.6	92.69	0.4	23.3	12.8	33.1	23.4
2000	6.9	102.11	5.4	-25.0	10.3	48.1	62.2
2001	18.9	111.94	8.4	79.9	10.5	27.0	28.1
2002	12.9	120.97	21.3	56.6	17.0	21.6	15.9
2003	14.0	129.36	10.2	35.7	13.1	24.1	29.5
2004	15.0	133.5	10.5	12.0	12.5	14.0	8.6
2005	17.8	132.2	6.5	14.5	10.4	24.4	29.7
2006	8.2	128.7	6.0	207.5	9.3	43.1	32.2
2007	5.4	125.83	6.4	-62.2	9.7	44.2	36.6
2008	11.6	118.6	6.0	28.8	11.9	46.6	46.4
2009	12.4	148.9	6.7	16.6	13.5	12.4	1.3
2010	13.3	150.2	6.7	16.6	13.5	12.4	1.3

Source: CBN Statistical Bulletins various Issues and author's calculation

Table 2.2 below shows that between 1980-84 average inflation was 20.5 percent and reaches all record high of 35.8 percent between 1990-94.

It declines thereafter and stood at 11.5 percent between 2005 -2010. The target of policy makers is to achieve a single digit inflation lower than the 2005 – 2010 level.

Table-2.2: Trend of Inflation in Nigeria, 1980-2010

Year	Average Inflation Rate
1980-1984	20.5
1985-1989	25.4
1990-1994	35.8
1995-1999	25.5
2000-2004	13.5
2005-2010	11.5

Source: CBN Statistical Bulletins various Issues and author's calculation

The table below shows that the relationship in average inflation rate for the period under review is almost inverse with growth rate. For example when inflation stood at 20.5 percent in 1980-84, growth rate was 10.5 percent and when inflation increase to 25.4 percent, growth rate decline to 4.4 percent and still further decline to 3.2 percent when inflation oscillated to 35.8 percent between 1990-94. However, both inflation and growth rate decline between 1995-99 and 2005-2010 periods respectively.

Table-2.3: Inflation and Growth Rate, 1980 - 2010 (%)

Year	Inflation Rate	Growth Rate
1980-1984	20.5	10.5
1985-1989	25.4	4.4
1990-1994	35.8	3.2
1995-1999	25.5	2.5
2000-2004	13.5	11.2
2005-2010	11.5	6.4

Source: CBN Statistical Bulletins various Issues and author's calculation

Methodology

The statistical technique to be used in the analysis of our data is essentially the ordinary least squares (OLS) test. This section then contains sources of data, the model specification and the estimation procedure. All the variables were tested for stationarity.

Sources of Data

Annual time series data of secondary nature are used for the research which was culled mostly from Central Bank of Nigeria (CBN) publications of various years, World Bank and IMF publications, Federal Ministry of Finance and National Bureau of Statistics (NBS).

Model Specification

In this study, we adopted a simple linear regression model employed by Emmanuel (2000) in which the determinants of inflation rate is modeled below:

$INF_t = \beta_0 + \beta_1 InDMC_t + \beta_2 InM2_t + \beta_3 InEXR_t + \beta_4 InFD_t + \beta_5 InTO_t + \beta_6 INT_t + \beta_7 InINF_{t-1} + V_t$…………………(1)

Where:
INF = Inflation rate
DCM = Domestic credit
M2 = Broad Money supply
FD = Fiscal deficit
TO = Trade Openness (i.e. Export + Import/GDP)
INT = Interest Rate
INF_{t-1} = One year lag of inflation
V_t = Error term
t = time trend
β_0, $\beta_1 - \beta_7$ = coefficients to be estimated

In order to determine the impact of inflation on economic development in Nigeria, the relationship between economic development proxied by nominal gross domestic product (GDP) and inflation is specified below.

$GDP = f(INF, MSP, DMC,)$………(2)

In stochastic form, this can be rewritten as:

$logGDP_t = c_0 + c_1 INF_t + c_2 LogMSP_t + c_3 logDC_t + e_t$……(3)

where:
GDP = nominal gross domestic product

A prior Expectation

Apart from exchange rate whose impact may either be positive or negative on inflation as well as inflation rate that should also have a similar impact on economic development; all other coefficients in both equations 1 and 3 are expected to have positive signs.

Test for Stationarity

Before our data was used for the analysis, its time series properties was investigated to establish whether the variables are stationary I(O), or non-stationary. The test was conducted using the Augmented Dickey-Fuller (ADF) and the Sargan-Bhargewa Durbin-Watson (SBDW) procedures discussed by Eagel and Granger (1987). To check for the order of integration we followed the Augmented Dickey-Fuller (ADF) (1981) test for unit roots stated thus;

$$\Delta Yt = \alpha 0 + \alpha 1t + \alpha 2Yt\text{-}1 + \sum_{i=1}^{k} \alpha_i \, \Delta Y_{t\text{-}i} + \mu_t \, \ldots\ldots(4)$$

The ADF can be restated thus:

$$\Delta Y_t = \delta Y_{t\text{-}1} + \sum_{i=1}^{k} \delta_i \, \Delta Y_{t\text{-}i} + \mu_t \, \ldots\ldots\ldots (5)$$

The ADF is generally regarded as the most efficient test from among the simple tests for integration and is at present the most widely used in practice (Charemza and Deadman, 1997). The testing procedure follows an examination of the student t-ratio for δ. The critical values of the test are all negative and larger in absolute terms than standard critical t-values, so they are called DF and ADF statistics. If the null hypothesis cannot be rejected then the series Y_t cannot be stationary and it may be I(1) or I(2) or have an even higher order of integration.

Presentation and Analysis of Results
Results of Stationarity Tests

The ADF test results in table 4.1 below show that all the variables employed for the study were non stationary. However, at first or second order differencing, stationarity was achieved at either 1 or 5 percent confidence levels. Additionally, domestic credit (DMC), trade openness (TO), broad money supply (M2) and gross domestic product (GDP) are in logarithmic values, inflation (INF), interest rate and exchange rate were not log since they were already in rates while fiscal deficit could not be logged due to large number of negative values.

Table-4.1: ADF Unit Root Test Results

Variable	Order	ADF Test	Mackinnon Critical Value	Included in Test Equation
INF	I(I)	-5.4571	1% = -4.3226	Trend & Intercept
EXR	I(I)	-3.3204	5% = 2.9706	Intercept
FD	I(2)	-5.2609	1% = -4.3382	Trend & Intercept
INT	I(I)	-4.9644	1% = -4.3226	Trend & Intercept
LDMC	I(I)	-4.3542	1% = -3.6852	Trend & Intercept
LTO	I(I)	-4.5348	1% = -4.5000	Trend & Intercept
LM2	I(I)	-3.5435	5% = -2.9705	Intercept
LGDP	I(I)	-3.1193	5% = -2.9705	Intercept

Regression Results: Determinants of Inflation (1980 -2010)

INF = -209.7 − 0.8EXR + 3.2FD + 17.7LDMC + 0.2INT − 4.8LTO + 4.2LM2 −
  (-2.8)   (-3.4)   (1.5)   (1.7)   (0.2)   (-0.5)   (0.4)
2.6 INF(-1)
  (-2.6)

$R^2 = 0.59$, F-Stat = 3.5, DW = 1.8

Table-4.2: Diagonistic Tests

Jarque Bera	0.28		No Specification Error
Breusch-Godfrey Serial Correlation LM Test	F-Stat = 2.0 Obs R^2 = 0.9	Probability = 0.2 Probability = 0.1	No Serial Correlation
ARCH LM	F-Stat = 0.2 Obs R^2 = 0.7	Probability = 0.7 Probability = 0.7	No Heretroscedasticity Problem
White Heteroskedasticity	F-Stat = 2.1 Obs R^2 = 18.5	Probability = 0.1 Probability = 0.2	Nil

The results above show that the variables are not serially correlated as the DW of 1.8 and the diagnostic tests of table 4.2 revealed. Similarly, the R^2 and the F-stat are relatively robust. A cursory look at the results shows that FD, DMC, INT and M2 have positive correlation with inflation in Nigeria. Thus, any of these variables has the potential to induce inflation within the study period. However, only FD and DMC are statistically significant in explaining inflation within the period under review. For example a unit increase in FD increases inflation by 3.2 percent while a unit decrease in FD decreases inflation by over 3 percent. The a prori signs of FD and DMC give credence to the findings of Emmanuel (2000) while that of M2 contradict the same study (Adebiyi, 2006). The insignificant nature of M2 is contrary to the widely held belief that it is a potent source of high inflation in Nigeria.

On the contrary, exchange rate (EXR), trade openness (TO) and a one year lag of inflation (INF(-1)) have a negative relation with inflation with only TO statistically insignificant. This means that a one percent increase/decrease in exchange rate leads to about 0.8 percent decrease/increase in inflation. The negative sign of INF(-1) shows that an increase or decrease in previous year inflation decreases or increases the current year inflation. The fact that it is significant shows how strong its influence on current inflation while the negative constant reveals that in the absence of all the explanatory variables, inflation would be negative.

Regression Results: Determinants of GDP with double log, 1980 -2010.

GDP = 600463.6 − 16456.0INF + 0.7DMC +
          (2.2)   (-2.0)   (2.0)
2.0M2
 (13.3)
$R^2 = 0.99$, F-stat = 431.8, DW = 1.5

Table-4.3: Diagnostic Tests

Breusch-Godfrey Serial Correlation LM Test	F-Stat = 0.9 Obs R^2 = 2.3	Probability = 0.4 Probability = 0.3	No Serial Correlation
ARCH LM	F-Stat = 0.01 Obs R^2 = 0.01	Probability = 0.9 Probability = 0.9	No Heteroscedasticity

In the results above, all the variables (i.e, INF, DMC and M2) are statistically significant in explaining economic growth in Nigeria. However, while the impact of DMC and M2 are positive on growth rate that of inflation is negative. This means that an increase in inflation decreases economic growth with a higher magnitude. The results show that about 99 percent of growth rate is explained by the combined effect of the independent variables. Although, the DW of 1.5 reveals a little presence of positive serial correlation, the diagnostic tests (see table 4.3) show that the

model is free from residual problems and thus the model is normally specified.

Regression Results – Determinants of GDP without log, 1980-2010.

$$GDP = 1353267.0 - 23784.8INF + 1.7DMC +$$
$$\quad\quad (1.9) \quad\quad (-1.1) \quad\quad (1.6)$$
$$2.1\ M2$$
$$(4.8)$$
$$R^2 = 0.93,\ F\text{-Stat} = 144.0,\ DW = 0.59$$

Here again, the impact of inflation on growth rate is negative with domestic credit and money supply exhibiting positive correlation. The results thus mirror the earlier findings. However, inflation is statistically insignificant in explaining growth rate in Nigeria. Although, the R^2 and the F-statistic are relatively high, the DW of 0.59 shows presence of positive serial correlation and thus the results cannot be relied upon.

Conclusion and Recommendation

The study sets for itself the task of investigating effective administration of monetary policy in Nigeria with emphasis on inflation. Thus, determinants of inflation in Nigeria as well as impact of inflation on economic development were investigated. Monetary policy in Nigeria has not been very effective over the years due mainly to the destabilizing effect of price level and or inflation. It has been theorized by many scholars that inflation retards economic growth (Adebiyi, 2006) and that inflation targeting must be aimed at less than double digits. Theoretically, it was discovered that inflation rises with increases in money supply and domestic credit but increase in inflation push down economic growth. The interests in the study spur from the fact that inflation is the most talk about and indeed of major concern to economists and policy makers. Inflation was of serious concern to the monetary economists and they recommended necessary possible measures to check it.

The study employs a simple linear regression while EXR, INT, DMC, M2, FD, TO and INF (-1) were employed as a determinants of inflation while INF, DMC and M2 as determinants of economic growth. A stationarity tests conducted revealed that apart from fiscal deficit which was stationary at second differencing, other variables in the study were stationary at first difference. The econometric results reveal that fiscal deficit, domestic credit and past level of inflation were determining factors influencing inflation in Nigeria within the study period. The impact of money supply on inflation was not significant though with positive sign while EXR, TO and INF (-1) negatively correlated with inflation. Examining the impact of inflation, domestic credit and broad money supply on economic growth, the study found that impact of inflation on economic growth is negative while money supply and domestic credit actually enhanced economic growth during the period under review. In this study therefore, it was discovered that inflation in Nigeria has a deleterious effect on economic development and we can conclude here that the Nigerian economy may not have performed well over the last 30 years because of debilitating effect of inflation. It is therefore recommended that

The monetary authority should ensure effective inflation targeting of less than double digit since the current impact of inflation on economic growth is negative.

Some variables such as domestic credit and fiscal deficit should not be made to grow excessively since, as we discovered in the study, were the major causes of inflation during the period, 1980 – 2010.

The agricultural sector in Nigeria should be developed while the manufacturing sector should be made to operate at full capacity. All these are to ensure that total output is increased and inflation is contained.

Finally, the various instruments of monetary policy such as open market operation, cash reserve ratio, bank rate etc, should be effectively deployed by the monetary authority to check inflation and minimize its negative influence on the economy.

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