



Research Paper

## Fiscal Policy And Inflation In Nigeria: An Insight Into The Critical Limit Hypothesis

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**Abstract:** This paper sought to investigate the effect of government activities on inflation in Nigeria by testing the presupposition of the critical limit hypothesis that was posited by Collin Clerk. Government activities was measured as a ratio of total government expenditure to aggregate output. The study covers the period 1991 to 2019 and the time series data were obtained from the Central Bank of Nigeria statistical bulletin and the World Bank database. The study utilized the Augmented Dickey-Fuller unit root test, Bounds test for cointegration, and the error correction model. The result of the unit root test indicated that the variables are stationary at mixed order of level and first difference. Meanwhile, the bounds test for cointegration revealed the existence of a long run relationship between government activities and inflation in Nigeria. Both the long run and the short run result indicates that government activities do not propel inflation in Nigeria over the study period. This signifies that the critical limit has not yet been reached. The error correction model indicates that 56.17% of the short run disequilibrium is corrected annually. The paper concludes that increased government expenditure in Nigeria is still desirable as it is not inflationary in any way. This is because government activities have not reached the 25% critical limit as set by Collin Clerk.

**Keywords:** Inflation, Government Activities, Fiscal Imbalance, Critical Limit Hypothesis.

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### I INTRODUCTION

Government activities can be measured by the rate of government involvement in the economy. In its conventional form, it is measured as the ratio of total government expenditure to aggregate output of the economy. Increased government activities have been linked to various reasons. As pointed out by Adolf Wagner, “there is a functional relationship between the growth in the per capita income and the growth in public expenditure” [1]. Meanwhile, the rate of growth in government expenditure, with time will be higher than the rate of growth in per capita income as a result of key factors such as the need to establish a system of justice to administer commercial laws and contracts, the growth in the scope and coverage of state activities from the traditional functions of maintaining peace and order to the provision of social and welfare services, increase in population resulting in increased demand for social services, and the shift from rural to urban centres with the attendant increase in per capita expenditures on civic amenities [2].

In attempting to explain the increasing government activities in the modern economy, Musgrave and Roster also established the development theory of public expenditure [1]. They concluded in their theory that government spending is necessary for economic development. They believed that in the early stages of economic growth, spending would be large in comparison to other sectors of the economy. The government is in charge of providing economic and social overheads, like roads, hospitals, water, electricity, sanitation, etc. as well as directly involved in the production of goods and services. These expenditures are critical for putting the economy on a road of long-term growth and prosperity. Since public spending complements private sector investment, public expenditure would be much lower in the middle stage of growth. At this time, public spending would be limited to infrastructure provision. As economic growth takes place, the balance of public investment shifts towards human capital development through increased spending on education, health and welfare services [3]. They believed that “the state expands like an individual, making decisions on behalf of its people, as society’s need for infrastructure services such as schooling, health, utilities, transportation, and so on, grows faster than per capita income” [4].

Digressing from the conventional approach of examining the reasons for the growth in public expenditures, Collin Clerk put forward the critical limit hypothesis to ascertain the optimal level of government

involvement in the economy that will not lead to inflation. As pointed out in his hypothesis, when the share of the government sector exceeds 25% of the total economic activity in the economy, inflation occurs even under balanced budget. When the share of government expenditure surpasses 25% of the “total economic activity, income recipients are so affected by reduced spurs due to high tax incidence that their productivity falls. Aggregate output falls as a result of the declining productivity. But the increased government spending aggravates the intensity of demand. Thus pushing up prices even at balanced budget. It follows that a country desirous to keep inflation at lowest minimum level will keep public expenditure within the 25% limit” [1].

Given the above hypothesis, it follows that excessive government spending can propel inflation if not backed by concomitant stimulation of aggregate output. In Nigeria, the share of government expenditure on total economic activity has been fluctuating over the years. A picture of this is presented in Figure 1 where we observed that government activities has declined over the years.

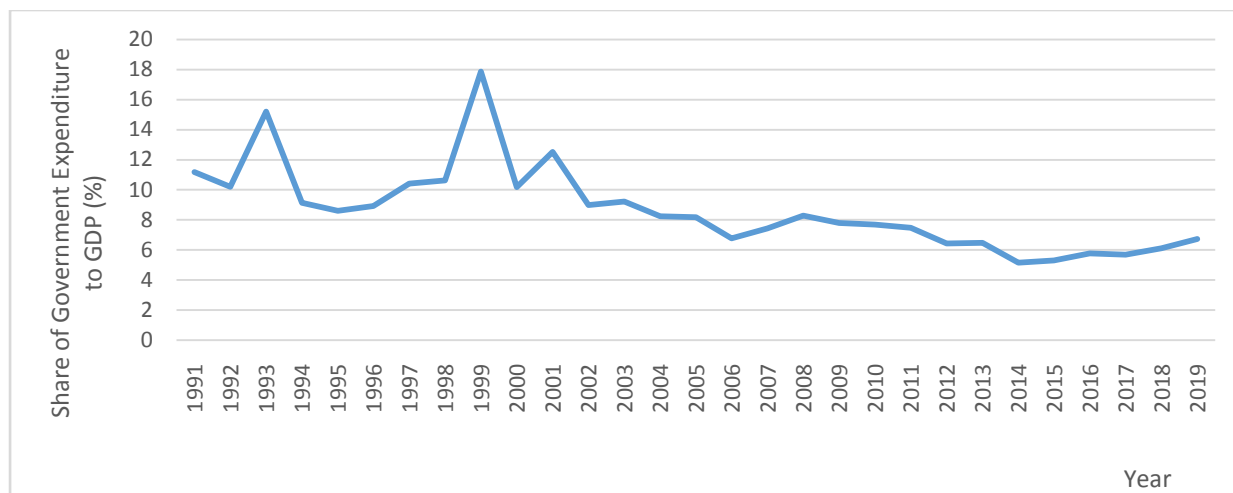


Figure 1: Share of Government Expenditure to GDP (1991 – 2019)

Looking at Figure 1, it is observed that the period 1991 to 2000 was matched with cyclical fluctuations in the share of government expenditure in total economic activity. Meanwhile, the period 2001 to 2014 witnessed continual decline in the share of government in total economic activities; while an increase is observed to be established for 2015 to 2019. It can be noticed that over the study period, the country has not reached or surpassed the critical limit of 25% as set by Collin Clerk in his critical limit hypothesis.

Over this study period, the rate of inflation has been fluctuating too, thereby making one to think whether fluctuations in government involvement can be linked to the rate of inflation in the country. A snapshot of the trend is presented in figure 2.

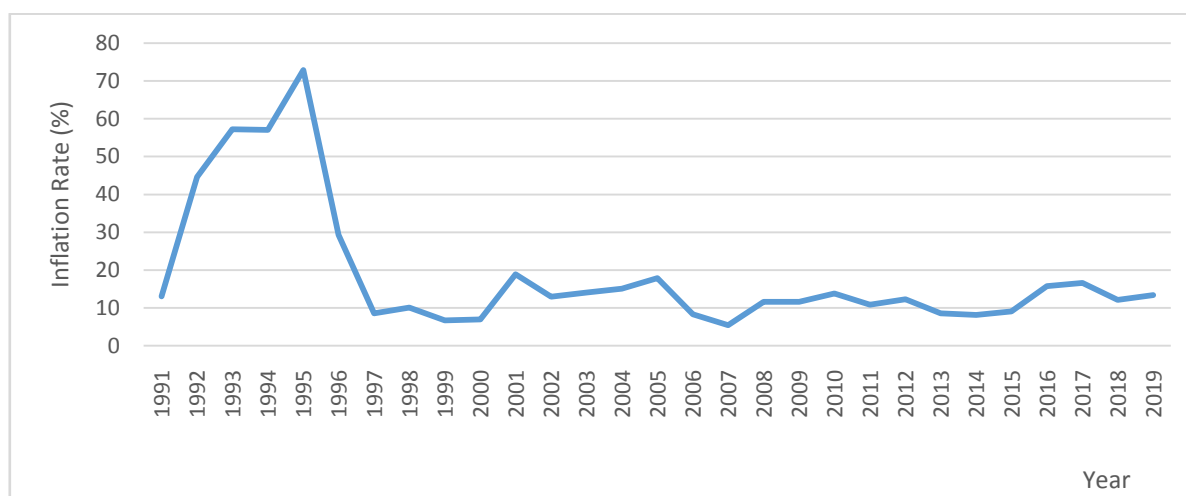


Figure 2: Trend of Inflation (1991 – 2019)

A look at Figure 1 and Figure 2 reveals that a period of high and fluctuating share of government expenditure to aggregate output was characterised with a sharp increment and concomitant decline in the rate of

inflation. Meanwhile, periods of stable and somewhat decline in government activities is characterised by low and somewhat stable rate of inflation. This relationship is shown in Figure 3.

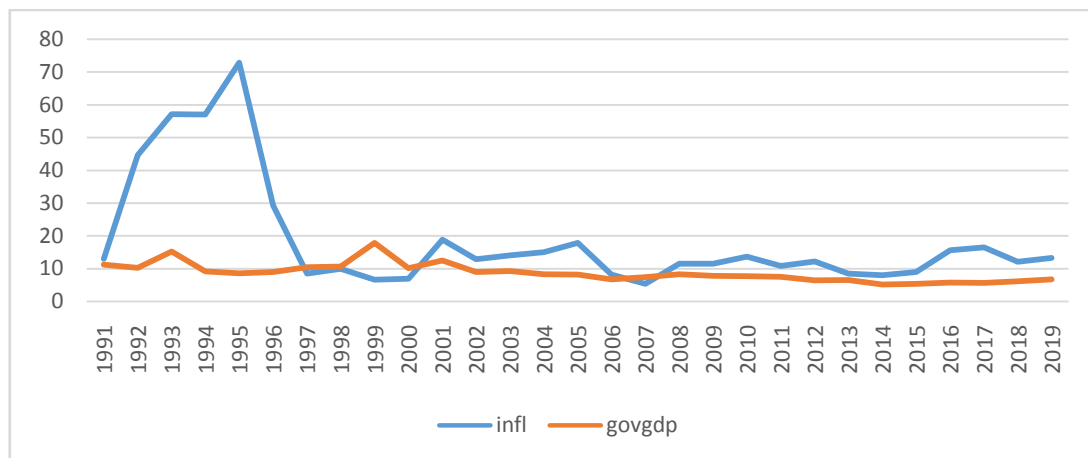


Figure 3: Trend of inflation and share of government spending to GDP

Given the above close nature of relationship in Figure 3, it can be said that “fiscal policy is relevant to achieving price stability even in an environment where monetary policy is conducted by an independent Central Bank” [5][6][8][9][10][11][12]. This idea therefore arouses the need to investigate whether the share of government expenditure on aggregate output could be linked to the rate of inflation in the country. That is, to investigate the effect of government activities on the rate of inflation in Nigeria over the period 1991 to 2019.

## II LITERATURE REVIEW

In theory, demand-pull, cost-push, structural inflation, and imported inflation have all been discussed in relation to inflation. As Gbanador [13] points out, demand-pull inflation theories characterize inflation as a condition in which aggregate demand for goods and services exceeds aggregate supply, resulting in a general increase in price levels. When there is full employment, the excess demand on the factors of production leads to higher costs for the factors, which then leads to an increase in the cost of production. It may also be a short-term anomaly caused by unanticipated market dynamics. Where there are supply constraints, demand that exceeds the maximum output level can result in inflation [14]. Demand-pull inflation may occur during cyclical booms during or shortly after war, as shown by the high rates experienced in Nigeria during the civil war from 1969 to 1970. During the war, the rate of inflation was very high [14].

Cost-push inflation is another explanatory backdrop to the problem of inflation. The term “cost-push inflation” refers to inflation that arises from the supply side. The rising cost of output is often to blame. This happens as manufacturing cost rise and have an effect on end product prices. [15]. The ‘cost push inflation’ may also be considered the ‘market power inflation’ since the rise in the costs of goods and services stems from the ‘supply side’ of the economy. These rises may be the result of higher wage prices or a drop in productivity, all of which raise the cost of labour production. “It may also be caused by other output conditions or variable costs, such as power supply, transport or raw materials” [15]. In monopolistic and oligopolistic markets, cost-push inflation may also occur as a result of manufacturers’ benefit motivations [14]. Since such businesses are inherently imperfect, their manufacturers may use price discrimination tactics to manage their prices.

We can also understand cost-push inflation by examining supplier conducts. As a result of the manufacturing costs (which are also not exclusive to any one producer), producers typically pass the cost burden to customers in the form of general price changes [16]. If all manufacturers follow suit, commodity costs are expected to escalate around the board. In imperfect economies, this is more common. Cost-push inflation is very popular in Nigeria. When the government announces a higher minimum wage, prices of goods and services increase, resulting in inflation [14]. This also negates the benefits of the pay increase, putting the Nigerian worker in a worse position than before the wage increase [17].

In the ‘structural theory of inflation’, inflation is linked to the economic growth mechanism. This is due to the fact that the mechanism produces disequilibria as a result of the structural changes that are required for growth [18]. Inflation is generally correlated with economic development, according to theorists, particularly in developed countries where institutional and structural constraints are present (Friedman [19]; Friedman, [20]; Varshney & Maheshwari, [21]). Inflation has a long-term trend, especially in developed western countries, due to gaps in productivity growth rates in the manufacturing and service sectors. Inflation emerges from the mechanism of competition to sustain overall revenue, total real expenditure, and total production, according to Turvey (1951) cited in Jhinghan [22].

In an analysis of inflation in the United States of America from 1955 to 1957, Schultz [27] found that price fluctuations were driven by sectorial changes in production rather than demand pull or cost-push causes. He theorized that because prices in deficient sectors do not collapse, surplus demand in other sectors would trigger a general price increase in a deficient market, resulting in an inflationary pattern in the economy [27].

Economies that depend heavily on imported products or services suffer from imported inflation [22]. Inflationary pressures could occur as a result of products being dumped in the importing economy, either as inputs or as final production. The high costs of these manufactured commodities are passed on to the local economies, resulting in an inflationary trend [22]. Inflation is distributed via a variety of networks, which have been established. If practicable, the domestic supply of goods and services to satisfy rising demand will be one of the most effective anti-inflationary policies in Nigeria. The inelastic market for international goods, on the other hand, is a significant restriction that must be addressed. Inflation could be regulated in oil-producing countries like Nigeria if crude oil could be refined in the country in the short term and the economy restructured into a more unified regime in the long run [23]. Imported inflation can be reduced with effective exchange rate management.

Gali and Gertler [24] examined inflation using the structural econometric analysis. They develop a systemic model of inflation that includes a small number of firms that set prices using a backward looking law. The strictly forward-looking New Keynesian Phillips curve is nestled as a special case in the model. Instead of an ‘ad hoc production gap’, they use measurements of ‘marginal cost’ as the relevant determinant of inflation, as the theory implies. Real marginal costs are a major and “quantitatively relevant determinant of inflation”, according to their results. Though statistically significant, ‘backward looking price setting’ is not quantitatively relevant. As a result, they argue that the ‘New Keynesian Phillips curve’ is a good first approximation for inflation dynamics.

Otto and Ukpere [17] conducted an observational analysis in Nigeria to determine the effect of monetary policy on inflation. The aim of the analysis was to demonstrate that the demands of the Academic Staff Union of Universities (ASUU), which could result in an increase in government spending, would not be inflationary. The study relied on time series data spanning the years 1980 to 2011. The Ordinary Least Squares (OLS) method of regression was utilized in the study. The findings of the study indicated that fiscal policy has an insignificant impact on inflation. The findings thus led to the recommendation that government should attend to the demands of ASSU since such will not trigger inflationary tendencies in the country.

López-Martín, Ramírez de Aguilar, and Samano [25] developed a secret Markov model in which inflation is dictated by government deficits funded by money creation and/or by destabilizing expectations dynamics. Sargent, *et al.* [26] suggested a baseline model that was used to examine the relationship between fiscal deficits, inflation perceptions, and inflation in Mexico. For the period 1969-1994, the behaviour of monetized deficits adequately accounts for high inflation episodes and stabilizations. The model is then extended to examine the likelihood that monetary policy will influence inflation perceptions in the form of Central Bank independence, as in Mexico after 1994. There is evidence that the exchange rate and sovereign interest rate spreads have an effect on the evolution of aggregate prices.

### III METHODOLOGY

#### 3.1 Basic Study Design

This paper utilizes an econometric approach to examining the validity of the Critical Limit Hypothesis in the Nigerian situation. The study covers the period of 1991 to 2019. The data were obtained from secondary sources and were analysed using econometric software.

#### 3.2 Model Specification

The model for this study is specified to incorporate variables of interest which include fiscal imbalances, growth rate of broad money supply, government activities, and unemployment rate. This is specified as follows:

$$INFL = f(FIMB, GMSS, GOVGDP, UNMP) \quad (1)$$

Where:

INFL = Inflation Rate (Consumer Price Index)

FIMB = Fiscal Imbalances (budget deficits and surpluses)

GOVGDP = Government Activities (measured as the ratio of total government expenditure to GDP)

UNMP = Unemployment Rate

Then Equation (1) is transformed into an estimable form which is amendable to econometric analysis as follows:

$$INFL = \gamma_0 + \gamma_1 FIMB + \gamma_2 GMSS + \gamma_3 GOVGDP + \gamma_4 UNMP + \mu \quad (2)$$

Where  $\gamma_0$  is the constant term;  $\gamma_1$  to  $\gamma_4$  are the parameters to be estimated; and  $\mu$  is the error term. It is expected that  $\gamma_1, \gamma_2$  and  $\gamma_4 < 0$  while  $\gamma_3 > 0$ .

### 3.3 Sources of Data

The data utilized in this study were obtained from the Central Bank of Nigeria statistical bulletin and the World Bank database. The data covers the period 1991 to 2019 and are purely annual time series data. Data on fiscal imbalance, growth rate of broad money supply, and government activities were all extracted from the Central bank of Nigeria statistical bulletin, while data on inflation and unemployment were obtained from the World Bank database on world development indicators.

### 3.4 Technique of Analysis

The technique of analysis employed in this study include the Augmented Dickey-Fuller (ADF) unit root test, the Autoregressive Distributed Lag (ARDL) Bounds test for cointegration, and the error correction model. The unit root test is conducted to ascertain the stationarity of the time series variables. The test assumes the constant assumption which is a random walk model with drift. The Bounds test is carried out to know whether a long run relationship exist given the fact that some of the time series variables may not be stationary at level. The error correction model captures how the short run distortions are corrected so as to attain equilibrium in the long run. The error correction model is estimated based on the ARDL approach.

## IV EMPIRICAL RESULTS AND DISCUSSION OF FINDINGS

### 4.1 Unit Root Test

The unit root test is based on the Augmented Dickey-Fuller (ADF) unit root test with the constant assumption. The result of the test is displayed in Table 1 using the 5% critical values.

**Table 1: ADF Unit Root Test Result with Constant Assumption**

| Variables | ADF Statistic at Level | 5% Critical Value at Level | ADF Statistic at First Difference | 5% Critical Value at First Difference | Order of Integration |
|-----------|------------------------|----------------------------|-----------------------------------|---------------------------------------|----------------------|
| INFL      | -1.9602                | -2.9718                    | -5.1574**                         | -2.9762                               | I(1)                 |
| FIMB      | 0.6848                 | -2.9718                    | -4.2865**                         | -2.9762                               | I(1)                 |
| GMSS      | -3.5309**              | -2.9718                    | -7.6774                           | -2.9762                               | I(0)                 |
| GOVGDP    | -1.4380                | -2.9762                    | -9.4889**                         | -2.9762                               | I(1)                 |
| UNMP      | 0.5311                 | -2.9762                    | -4.1001**                         | -2.9762                               | I(1)                 |

Source: Authors' Computation

It follows from the result of the ADF unit root test that the variables are stationary at mixed order – level I(0) and first difference I(1). Inflation rate, fiscal imbalances, government activities and unemployment rate are all stationary at first difference. This is because their respective 5% critical values are statistically significant. Also, only the growth rate of broad money supply is observed to be stationary at level. We then conduct a cointegration test to ascertain the existence of any levels relationship in the model.

### 4.2 Bounds Test for Levels Relationship

Since our variables were in mixed order of integration both at level and first difference, the Bounds test for cointegration is employed to ascertain the existence of any levels relationship. The output is presented in Table 2, where we present the F-test and the upper and lower bounds values at the 10%, 5% and 1% level of significance.

**Table 2: Bounds Test for Cointegration Result**

| Test Statistic | Value    | Level of Significance | I(0) | I(1) |
|----------------|----------|-----------------------|------|------|
| F-statistic    | 3.5539** | 10%                   | 2.2  | 3.09 |
| k              | 4        | 5%                    | 2.56 | 3.49 |
|                |          | 1%                    | 3.29 | 4.37 |

Source: Authors' Computation

We observe that the F-statistic (3.5539) is greater than the 1% and 5% critical values at both the lower and upper bounds thus, the F-statistic is significant. The significance of the F-statistic signifies that there is a long run relationship in the model. Therefore, cointegration exists. We then estimate both the long run and short run estimates of the model.

### 4.3 Long Run Error Correction Estimates

In examining the effect of government activities on inflation in Nigeria, the long run estimates are presented in Table 3. Here, the long run coefficients of the variables of interest are observed to know the magnitude of their effect on inflation as well as monitoring the t-statistic to ascertain whether such coefficients have any significant impact on inflation.

**Table 3: Long Run Result**

| Variable | Coefficient | Standard Error | t-Statistic | Probability |
|----------|-------------|----------------|-------------|-------------|
| FIMB     | -0.071      | 0.022          | -3.150      | 0.0062**    |
| GMSS     | 1.533       | 0.411          | 3.729       | 0.0018**    |
| GOVGDP   | -3.448      | 2.091          | -1.649      | 0.1186      |
| UNMP     | -29.661     | 11.042         | -2.686      | 0.0162**    |
| C        | 135.587     | 58.488         | 2.318       | 0.0340**    |

Source: Authors' Computation

From the result, we observe that fiscal imbalances, growth rate of broad money supply and unemployment rate have a significant effect on inflation rate in Nigeria. Meanwhile, government activities seem to have an insignificant effect over the study period. Both fiscal imbalances and unemployment exerted a negative effect on inflation rate. It thus follows that a unit percentage increase in fiscal imbalance will cause inflation to reduce by 0.071%; while a unit percentage increase in unemployment rate will lead to a 29.661% reduction in the rate of inflation. The effect of the fiscal imbalances can be explained based on the fact that it is a general belief that a budget deficit will be inflationary while a budget surplus will be less inflationary. Also, the effect of unemployment is captured on the Philips' postulation that an inverse relationship exists between the rate of inflation and the rate of unemployment. The insignificance of the government activities in influencing the rate of inflation do not hold as postulated in the Critical Limit Hypothesis. An insight into our data shows that government expenditure as a percentage of the total economic activities do not reach the 25% benchmark as stated in the Critical Limit Hypothesis. As such, government activities are not inflationary over the study period. It is also observed that the growth rate of broad money supply exerts a positive and significant effect on the rate of inflation. Thus, a unit percentage increase in the growth rate of broad money supply will lead to a 1.533% increase in the rate of inflation and vice versa. This finding is realistic in the sense that too much of money in circulation will likely force prices up leading to a high rate of inflation in the economy.

### 4.4 Short Run Error Correction Mechanism

Given the fact that some short run dynamics can cause some degree of distortions in inflation, the short run error correction model is also estimated to ascertain how the short run disequilibrium is corrected annually. This is presented in Table 4.

**Table 4: Short Run Error Correction Estimates**

| Variable              | Coefficient | Standard Error | t-Statistic             | Probability |
|-----------------------|-------------|----------------|-------------------------|-------------|
| D(FIMB)               | -0.0185     | 0.0058         | -3.1786                 | 0.0058**    |
| D(GMSS)               | 0.2790      | 0.1104         | 2.5275                  | 0.0224**    |
| D(GMSS(-1))           | -0.2122     | 0.1135         | -1.8699                 | 0.0799*     |
| D(GOVGDP)             | -0.7226     | 0.5958         | -1.2129                 | 0.2428      |
| D(UNMP)               | -5.1898     | 3.1046         | -1.6716                 | 0.1140      |
| ECM(-1)               | -0.5617     | 0.1062         | -5.2903                 | 0.0001**    |
| R-squared             | 0.5817      |                | Adjusted R-squared      | 0.4822      |
| Akaike Info Criterion | 7.166       |                | Durbin-Watson statistic | 2.091       |

Source: Authors' Computation

In the short run, fiscal imbalances also exert a negative and significant effect on the rate of inflation. Thus, a unit percentage change in fiscal imbalances will lead to a 0.0185% decrease in inflation. Also, the growth rate of broad money supply exerts a positive and significant short run effect on inflation. It follows that a unit percentage change in the growth rate of broad money supply will lead to a 0.2790% increase in the rate of inflation. It is also being revealed from the result that the one-period lag of the growth rate of broad money supply decreases the rate of inflation by 0.2122%. Changes in government activities in the short run is also termed to be less inflationary since its effect is negative and statistically insignificant at the 5% level of significance. This same trend is also observed for the short run effect of unemployment on the rate of inflation in Nigeria over the study period.

The coefficient of the error correction mechanism ((ECM(-1)) which is -0.5617 is negative as expected and statistically significant at the 5% level. We can say that 56.17% of the short run disequilibrium is corrected annually so that equilibrium is restored in the long run. It follows that it will take approximately two years for equilibrium to be fully restored. The R-squared, which measures the coefficient of multiple determination and as

an indicator of the goodness of fit of the regression line, is 0.5817 and indicates that 58.17% of the total variations in the rate of inflation is caused by the variations in the explanatory variable. This is not quite high and therefore indicates that other key variables may be responsible for the rising rate of inflation in Nigeria. This can be linked to factors such as high transportation cost, exchange rate volatility which causes an upsurge in the prices of imported inputs for domestic production, and other structural issues that faces the country.

#### 4.5 Stability Test

The stability of the coefficient is tested using the Cumulative Sum (CUSUM) approach. The output of the test is shown in Figure 1 where the green line depicts the CUSUM and the dash red lines depicts the 5% significance.

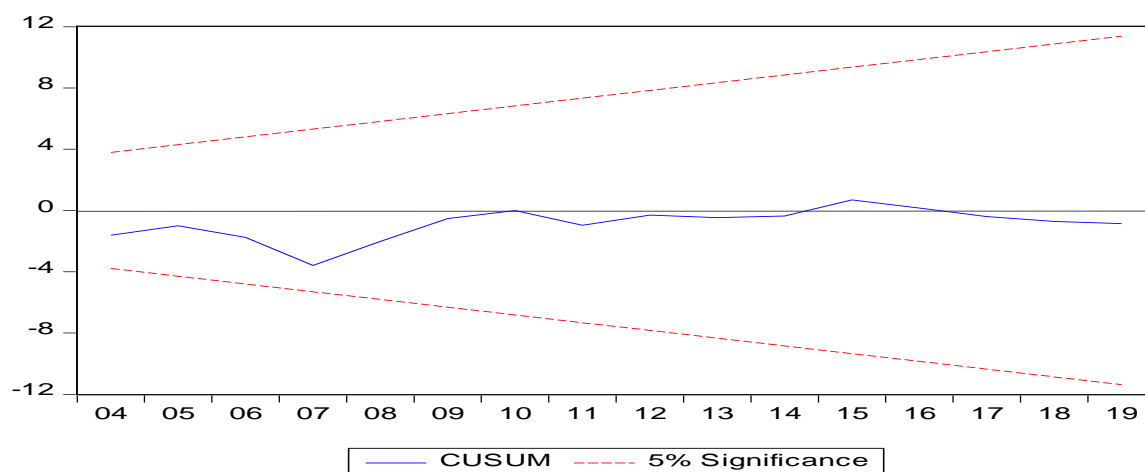


Figure 1: Stability Test using CUSUM approach

It follows from the test that the CUSUM line lies within the 5% critical values for both the upper and the lower bounds. As such, the coefficients are stable and can be rightly used for inferences.

## V CONCLUSION AND RECOMMENDATION

In this paper we examined the effect of government activities in accelerating inflationary pressures in Nigeria. Government activities was captured to be the ratio of total government expenditure to aggregate output of the economy. This paper got its inspiration from the critical limit hypothesis which states that “when the share of the government sector exceeds 25% of the total economic activity in the economy, inflation occurs even under balanced budget”. The paper utilized the error correction model to ascertain both the long run and the short run dynamics of the effect of government activities on inflation in Nigeria over the period 1991 to 2019. The Bounds test for levels relationship indicates that there is a long run relationship between inflation and the explanatory variables in the model.

From the long run analysis, fiscal imbalance, growth rate of broad money supply and unemployment rate were all statistically significant in influencing the rate of inflation in Nigeria. Meanwhile, government activities were seen not to be inflationary in nature. In the short run, fiscal imbalance and the growth rate of broad money supply were all significant in influencing inflation in Nigeria, while government activities and unemployment were both insignificant in propelling inflation in Nigeria. The error correction model signifies that 56.17% of the short run disequilibrium is corrected annually. The paper therefore advocates for increased government activities since the critical limit has not yet been reached.

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