

# COUNTER CYCLICAL POLICIES AND THE PARADOX OF INFLATIONARY RECESSION IN NIGERIA

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## **Abstract**

*This study examined the feedback of inflationary recession based on its response to monetary and fiscal policies in Nigeria. This is against the postulation of A.W. Phillips in 1958 who assumed a negative relation between inflation and unemployment. The paper used data from 1971 – 2015 (the period underlying the emergence of stagflation) and adopted the Ordinary Least Square (OLS) method to give empirical content to the theoretical postulations. The study found out that monetary and fiscal policies are not significant in curbing inflationary recession in Nigeria and needs to be re-examined. Also, the fairly strong relationship between the variables suggests that there is still weak complementarity between monetary and fiscal policies in Nigeria. Comparatively, fiscal policy seems more effective than monetary policy in reducing economic stagnation and inflation in Nigeria. Also, the Philips relationship appears to be inverse in the Nigerian economy and the response of stagflation to monetary and fiscal policies is still inconsequential. The study therefore recommends that, first; the fiscal authority should complement the monetary authority by providing a good regulatory environment that will encourage the appropriate conduct of monetary policy in Nigeria, second; to reduce inflationary recession, fiscal policies should be focused on the objective of easing labour market conditions and increasing productivity, and third; to buffer internal balance measures of monetary policy, the monetary authority should avoid rapid changes in the rate of monetary growth as this would lead to variations in the rate of inflation.*

**JEL Classification:** 458, H5, P24, P44

## **1. Introduction**

THE continuous slowdown of growth in emerging economies, sustained pressure in global financial markets, reduced aggregate global demand and dampened global oil market have persistently affected world output. Cross-country contagion has transmitted this spillover effect to Nigeria (especially from oil price shocks) affecting domestic output, which has decelerated notably – declining from 6.22% in 2014 to 2.79% in 2015 and further to -0.36% and -2.06% in Q1 and Q2 of 2016 respectively (CBN, 2016). On the home front shortage in foreign exchange, scarcity of fuel, increased energy tariff, security challenges in some parts of the country – and consequently rising inflation accounts for the output loss. The policy

response to mitigate this sluggish economic performance seems ineffectual as the country failed to capitalise on the significant growth (boom) witnessed in the last decade to buffer its reserves, create employment and narrow its infrastructure deficit.

Indeed, the Nigerian economy has over the years consistently exposed fundamental realities about managing vulnerabilities and ensuring sustained stability against theoretical postulations and a priori expectations. The challenges confronting the Nigerian economy in recent times are complex and simultaneous. According to Todaro and Smith (2010), economic theory suggests that sustained economic growth say for a period of 10 years will automatically translate into economic development. Thus, it is believed that an expanding economy provides the impetus for a rising level of employment and a falling rate of unemployment. This situation however seems to be untrue in most underdeveloped countries and shelve a paradox. According to Hassan, Sule and Abu (2015), rapid growth in China, Malaysia and India succeeded in lifting millions of people beyond subsistence living; while Nigeria and other African countries have experienced the opposite. Nigeria has succeeded in expanding its productive potential in the past decade; however, this sustained economic growth has not translated to higher real living standards and higher employment.

This paradox of growth and development has been accompanied by a sustained increase in the general price level leading to a fall in the purchasing power/value of money – birthing inflation. The problem of inflation has been endemic since the early 1970s and emerged as a thorny economic phenomenon for countries all over the world (Dwivedi, 2008). Persistent inflation is perhaps the second most critical economic problem confronting the world economy today – second only to hunger and poverty in the third world; thus becoming one of the dominant objectives of macroeconomic policy. Inflation being a dominant economic problem has undergone different rhythms with its associated costs. By the late 1970s, a new problem of accelerating inflation associated with prolonged and persistent unemployment (paradox of inflationary recession) had arisen to confront policy makers and economists.

Inflationary recession is a far cry in comparison to the postulation of Phillip (1958) who asserted that when unemployment is high, the rate of money increase in money wage rate is low; implying that inflation (as substituted by the neo classical) and full employment are proportional. This is contradictory as the Nigerian economy has witnessed simultaneous increase in both inflation and unemployment in recent times. Inflation increased steadily from 9.55% in December 2015 to

18.48% in December 2016 (CBN, 2016) while unemployment rate rose from 10.4% in December 2015 to 12.1% in the first quarter of 2016 (NBS, 2016) which is the sixth consecutive rise since the fourth quarter of 2014. Persistent inflation has led to political and social instability while unemployment has imposed heavy economic and social costs on Nigerians.

Drastic action has been taken to stabilise the economy from high and volatile inflation alongside accelerating unemployment in the form of fiscal and monetary policies. Empirical studies have shown that the impact of monetary policy (Okwori and Abu, 2015) and fiscal policies (Abata, Kehinde and Bolarinwa, 2012) is weak in ensuring financial and economic stability in Nigeria. The effectiveness of monetary and fiscal policies in the Nigerian economy is therefore paramount for national sustainable development and disaster management. To close this gap, this study thus seeks to investigate; first, the trade-off between persistent inflation and rising unemployment in Nigeria, second, the effect of government policies on inflation and unemployment and third, the relative efficacy of fiscal and monetary policies in combating inflationary recession in Nigeria. To achieve these measures, the empirical model will be analysed via the ordinary least square technique.

## **2. Review of Related Literature**

### **2.1 Stagflation**

Stagflation is a new term which has been added to economic literature in the 1970s. The word 'stagflation' is the combination of *stag* plus *flation*, taking 'stag' from stagnation and 'flation' from inflation. Thus, it is a paradoxical situation where the economy experiences stagnation or unemployment along with a high rate of inflation. It is therefore also called inflationary recession. One of the principal causes of stagflation has been restriction in the aggregate supply. When aggregate supply is reduced there is a fall in output and employment and the price level rises. A reduction in aggregate supply may be due to a restriction in labour supply. The restriction in labour supply, in turn, may be caused by a rise in money wages on account of strong unions or by a rise in the legal minimum wage rate, or by increased taxes which reduce work effort on the part of workers. When wages rise, firms are forced to reduce production and employment. Consequently, there is a fall in real income and consumer expenditure. Since the decline in consumption will be less than the fall in real income, there will be excess demand in the commodity market which will push up the price level. The rise in the price level in turn reduces output and employment (Jhingan, 2003).

Another cause of restriction in aggregate supply is the increase in indirect taxes by central state and local governments. When indirect taxes are increased, they raise costs and prices and reduce output and unemployment. Moreover, when the government increases taxes, it leads to the transfer of real purchasing power from the people to the government. As a result, aggregate demand falls, and output and employment are adversely affected. If however, the government increases its expenditure equal to the increase in tax revenue, it would raise the price level further due to increase in additional demand (Binks and Jennings, 1986).

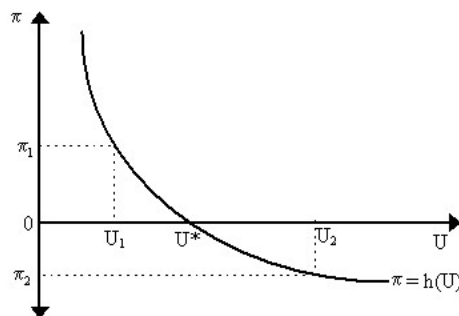
Often, economies impose direct controls as a means controlling inflation. But when such controls are removed, decontrolled sectors raise prices of their products with the result that wages rise and the wage price spiral spreads to the entire economy. This in turn adversely affects production and employment through a decline in the real quantity of money, rise in interest rates, fall in investment via the Pigou effect, and exports becoming dearer and imports attractive. Restriction in aggregate supply can also be caused by external forces such as rise in the world prices of agricultural products and crude oil prices. In all these cases, the domestic price level is raised by outside forces. When international prices of food grains and crude oil rise, they lead to the outflow of purchasing power away from domestic consumers. They accentuate inflation, raise wages and prices. As a result, the real quantity of money declines, interest rates rise and investments decline via the Pigou effect making domestic output and employment decline. Economists have suggested measures which slow inflation and maintain higher unemployment. These measures exist through monetary and fiscal policies. This research thus examines the feedback of the inflation-unemployment nexus in response to these fiscal and monetary policies.

## **2.2 Theoretical framework: The Phillips curve**

Central to the classical view of the Aggregate Supply Schedule (ASS) is the flexibility of money wages and hence real wages. The fundamental difference between the classical and Keynesian ASSs rests on the treatment of wage flexibility in the labour market. Keynes introduced the assumption of wage rate rigidity. In particular he assumed that money wages would be flexible in an upward direction but, because of imperfections in the labour market, downward movements in the money wage would be very difficult to achieve (Binks and Jennings, 1986). The implication of this is that, while an excess demand for labour would be only short-lived because the money wage would be quickly bid up, an excess supply would persist as money wages would not be equally bid down. The labour market is thus

in a state of disequilibrium or ‘Keynesian’ unemployment. The classical assumed that flexible markets would ensure that equilibrium is quickly reached. Keynesian economists questioned the speed of this adjustment process and opened the possibility for governments to trade off short run reductions in unemployment against price level increases.

Of crucial importance to the above description of the Keynesian equilibrium is the speed at which markets adjust. The long run cost of a demand management policy, the higher the price level, outweighs any short run gain. If markets are inflexible, however, and it takes time to regain a new equilibrium, there is a short term benefit from creating excess demand in the economy. In particular, it raises the possibility of ‘trading-off’ lower unemployment against higher inflation. This trade-off is central to the Keynesian thesis. It was formalised and given apparent statistical backing by A.W. Phillips in 1958 and became enshrined in the curve which bears his name (figure 1). The Phillips curve examines the relationship between the rate of unemployment and the rate of money wage changes – expressing an inverse relationship. Basing his analysis on data for the United Kingdom, Phillips derived the empirical relationship that when unemployment is high, the rate of increase in money wage rates is low (Phillips, 1958). This is because ‘workers are reluctant to offer their services at less than the prevailing rates when the demand for labour is low and unemployment is high so that wage rates fall very slowly.’ On the other hand, when unemployment is low, the rate of increase in money wage rates is high. This is because, ‘when the demand for labour is high and there are very few unemployed, we should expect employers to bid wage rates up quite rapidly.’



**Figure 1: The relation between unemployment and inflation**

The second factor which influences this inverse relationship between money wage rate and unemployment is the nature of business activity. In a period of rising

business activity, when unemployment falls with increasing demand for labour, the employers will bid up wages. Conversely, in a period of falling business activity when demand for labour is decreasing and unemployment is rising, employers will be reluctant to grant wage increases. Rather they will reduce wages. But workers and unions will be reluctant to accept wage cuts during such periods. Consequently, employers are forced to dismiss workers, thereby leading to high rates of unemployment. Thus, when the labour market is depressed, a small reduction in wages would lead to large increases in unemployment (Jhingan, 2003). Philips concluded on the basis of the above argument that the relation between rates of unemployment and of change of money wages would be highly non-linear when shown on a diagram.

In its original format, as developed by Phillips and later economists, such as R. Lipsey, the trade-off was presumed to be permanent; rates of unemployment below  $U^*$  would lead to persistent positive rates of inflation. The later emphasis placed on the speed of adjustment of the labour market implied that the trade-off would only be temporary, lasting only until the labour market had regained its equilibrium position. In addition, they also cast doubts on the practical operation of Keynesian demand management, pointing out that such a policy requires a detailed knowledge of the current position of the economy, the speed at which adjustment is taking place and the exact level of fiscal and monetary stimuli required to achieve a desired position on the Phillips curve. Monetarists claim that to assume access to such information is unrealistic. However, the simultaneous occurrence of high inflation and high unemployment in the 1970s and 1980s highlighted the weaknesses of the Keynesian model presented so far. The Phillips relationship appeared to have broken down. The economy is reverting to its natural level of unemployment, but with accelerating inflation. This situation appears to be true in Nigeria which has witnessed both accelerating inflation and unemployment in recent times. This has necessitated this study to investigate if or otherwise the Phillips relation holds using Nigeria data.

### **2.3 Empirical review**

Umoru and Anyiwe (2013) examined the ‘dynamics of inflation and unemployment in Nigeria.’ The vector error correction model was used to examine the data collected for a period of twenty-seven years from 1986 - 2012. The study reveals that there is evidence of stagflation in the Nigerian economy within the study period. It also found out that the Nigerian economy is managing inflation shocks alongside economic recession due to an astronomic rise in unemployment putting

the country at cross roads. Based on the finding, the study recommended that the CBN should maintain a stance of gradual reduction in of the inflation benchmark to a single digit as the excessive contraction of the monetary policy rate seems to have become counterproductive in recent times. They further opined that single digit inflation rate can be achieved if the CBN could increase GDP growth above money supply and increase lending to the real sector of the economy.

Orji, Orji and Okafor (2015) analysed the inflation-unemployment nexus in Nigeria hinging the theoretical underpinning on the Philip's curve. In their bid to test if the original Philip's curve proposition holds for Nigeria, they adopted a distributed lag model with data covering the period of 1970 – 2011. The variables used were consumer price index, unemployment rate, growth rate of money supply, budget deficit, real gross domestic product, interest rate and the lag of current interest rate. The result reveals that unemployment is a significant determinant of inflation in the country. Also, it shows that there is a positive relationship between inflation and unemployment rate, thus invalidating the original postulation of Philip's curve with respect to Nigeria. They recommended that the economy should be diversified and appropriate policies be put in place by government and monetary authorities to curb the menace of inflation and unemployment, thereby reducing the problem of stagflation in Nigeria. Also, they stated that there is a need for strong institutional collaboration in dealing with inflation and unemployment.

Matthew (2015) evaluated the effectiveness of monetary policy in controlling inflation in the Nigerian economy using a data-rich framework. The relevance of monetary policy indicators in explaining changes in the general price level was investigated using the ordinary least squares (OLS) technique and the granger causality test using annual data for the period 1986 – 2013. The variables used were: inflation rate, monetary policy rate, broad money supply, exchange rate and economic growth. The granger causality result indicated that a unidirectional relationship exists between inflation and monetary policy rate and between economic growth and INF running from INF to GDP. The OLS result showed that monetary policy rate is not significant but has a positive impact on inflation. Broad money supply and exchange rate impacts inflation negatively and are not statistically significant. On the other hand, economic growth is significant and positively impacts inflation in Nigeria. The study concluded that there is evidence of the price puzzle and confirmed that monetary policy is not effective in stabilizing prices in Nigeria. Thus, the study recommended that monetary policy in Nigeria would be effective in taming inflation if financial inclusion is strengthened

and new non-bank models are sought in ensuring that the monetary authority has good control of money supply and other monetary indicators.

Gbadebo and Mohammed (2015) examined the effect of monetary policy on inflation in Nigeria. This was done in order to evaluate the effectiveness of monetary policy as an anti-inflationary measure in Nigeria. In order to explore this relationship, the cointegration and error correction methods were employed using quarterly time series data spanning from 1980Q1 to 2012Q4. The variables used were: money supply, exchange rate, interest rate, oil price, GDP and inflation. The estimated result reveals that interest rate, exchange rate, money supply and oil-price are the major causes of inflation in Nigeria. It was observed that although in the short-run increase in income encourages inflation, proper utilization of economic growth reduces inflation. Money supply shows a significant positive impact on inflation both in the short and long run implying that the Nigerian inflationary situation is driven by monetary impulses. The study therefore recommended that anti-inflationary monetary policy measures, backed by some necessary fiscal policies, are incumbent for structural and economic stabilization in Nigeria. Also, the government should also stimulate the productive capacity of the economy, especially the agricultural sector to increase aggregate supply of food products so that prices will come down and consequently reduce the rate of inflation.

Eze (2015) evaluated the relative impact of inflation and unemployment and economic growth in Nigeria for a period of 1980 – 2013. The OLS method was used to amplify the analysis. The Johansen co integration test showed evidence of long run equilibrium relationship between unemployment, inflation and gross domestic product in Nigeria. Even though the coefficients of inflation and unemployment were found to be highly significant, their parameter estimates showed an inverse relationship with gross domestic product. The granger causality test revealed that there is no causality between inflation and unemployment, thus they are independent of each other. The study recommended that the Central Bank of Nigeria should pursue more vigorously and transparently its policy of inflation targeting. Also, the energy sector should be revived to absorb millions of unemployed youths that are graduates.

Kareem, Afolabi, Raheem, and Bashir (2013) analysed the effect of fiscal and monetary policies on economic growth in Nigeria with evidence from the country's democracy. Data were collected on inflation, interest rate, narrow money, broad money, government recurrent and capital expenditure and were analysed using regression analysis, correlation analysis and descriptive statistics. The result revealed that there have been fluctuations in the trend of the policy variables with



reference to the stable democracy in Nigeria between 1999 and 2008. The study, however, showed that narrow money, broad money, government recurrent and capital expenditure are significant variables that affect economic growth in Nigeria and recommends that in order to put the Nigerian economy on the path of sustainable growth and development, the democratically elected government must harness and better coordinate her fiscal and monetary policies in conjunction with the Central Bank of Nigeria in order to enhance the welfare of the citizenry.

Egbulonu and Amadi (2016) examined the relationship between fiscal policy and unemployment rate in Nigeria for the period 1970 to 2013. The study variables were: government expenditure, government debt stock (as proxy for government borrowing), government tax revenue and unemployment rate. The study found a negative relationship between fiscal policy tools (government expenditure and government debt stock) and unemployment rate in Nigeria while government tax revenue exhibited a positive relationship with unemployment rate. This means that increase in tax rate reduces employment in Nigeria. The results also revealed that, there exist a long-run equilibrium relationship between unemployment and fiscal policy in Nigeria. It recommended that government should increase her capital expenditure mostly on infrastructure as this will help improve national income and create more employment in the economy; borrowed funds by the government should be invested properly on capital and physical goods which will stimulate national incomes and create more jobs; and that government should also intensify fight against corruption to mitigate diversion of government funds to private pockets. The study also recommended strong implementation of viable fiscal and monetary policy mix as well as diversify the nation's economic base in order to expand the employment base of the nation.

Chigarande (2012) examined the relative effectiveness of monetary and fiscal policies on economic activity in Zimbabwe. The study adopted a modified St. Louis equation for the period 1981:4 to 1998:3 using an error correction approach. The estimated equations were found to exhibit structural stability implying their usefulness for the purpose of forecasting and policy analysis. Money supply was found to be consistent with economic theory while the impact of exports on economic activity was not significant. The result indicated that monetary influence is relatively stronger and more predictable than fiscal policy in determining economic activity— thus it can be relied upon as a successful macroeconomic stabilization tool in Zimbabwe. The study suggested that fiscal policy should therefore be streamlined as it is found to have an insignificant impact on economic activity in Zimbabwe.

Abubakar (2016) investigated the effect of fiscal policy shocks on output and unemployment in Nigeria under the Keynesian framework by employing the structural vector autoregression (SVAR) methodology to analyse annual series on the relevant variables for the period 1981- 2015. Findings of the SVAR model shows shock in public expenditure as having a positive long-lasting effect on output. Revenue shock was found to exert a positive effect (lower than that of public expenditure shock) on output. However, the effect of revenue shock on unemployment was found to be negative but short-lived. The study suggested that government should restructure its spending pattern by allocating more to productive expenditure. In the same vein, it was suggested that government should harness its revenue potentials by expanding its revenue base via effective and efficient taxation system and also through diversification of its revenue base.

Umaru and Zubairu (2012) empirically estimated the effect of inflation on the growth and development of the Nigerian economy. The study employed the granger causality test to ascertain the direction of causality between inflation and GDP in Nigeria. Simple regression analysis was also used to estimate the relationship. Data were collected for the period 1970 – 2010 on inflation and GDP. The study found out that there is a unidirectional relationship between inflation and GDP suggesting that GDP causes inflation, but not inflation causing GDP. It also revealed that inflation positively affects economic growth. The study recommended that concerted efforts should be made by policy makers to increase the level of output. This can be done by improving productivity in order to reduce the prices of goods and services– thereby reducing the rate of inflation, so as to boost the growth of the economy.

Most of the studies reviewed have focused on the relationship between monetary policy and inflation or fiscal policy and unemployment in Nigeria. Others have examined the inflation-unemployment dynamics while some studies have extended the effect of this relationship to the economy. The results have not provided a unanimous report of the relationships highlighted above. This study improves on the reviewed studies by evaluating the joint effects of monetary policy, fiscal policy and other measures on stagflation. This is important because, inflation and unemployment have been rising together in Nigeria against the postulation of A.W. Phillips. Thus, the study examined the feedback of inflationary recession based on its response to monetary and fiscal policies in Nigeria.

### 3. Methodology

#### 3.1 Model specification

One of the most widely used concepts in the modern analysis of the problem of inflation and unemployment is the Phillips curve. In its original formulation, this relation depicts an empirically based negative relation between the rate of growth of money wage and the rate of unemployment:

$$w = f(U) [f'(U) < 0] \tag{1}$$

Where:

W = rate of growth of money wage W (i.e.,  $w \equiv W/W$ ) and  
 U = rate of unemployment

It thus pertains only to the labour market. Later usage, however, has adapted the Phillips relation into a function that links the rate of inflation (instead of  $w$ ) to the rate of unemployment. This adaptation may be justified by arguing that mark-up pricing is in wide use, so that a positive  $w$ , reflecting growing money-wage cost, would necessarily carry inflationary implications. And this makes the rate of inflation, like  $w$ , a function of  $U$ . The inflationary pressure of a positive  $w$  can, however, be offset by an increase in labour productivity, assumed to be exogenous and denoted by  $T$ . Specifically, the inflationary effect can materialise only to the extent that money wage grows faster than productivity. Denoting the rate of inflation – that is, the rate of growth of the price level  $P$  – by  $p$ , ( $p \equiv P/P$ ) may thus be written as:

$$p = w - T \tag{2}$$

Combining equations 1 and 2, and adopting the linear version of the function  $f(U)$ , we then get an adapted Phillips relation:

$$p = \alpha - T - \beta U (\alpha, \beta > 0) \tag{3}$$

More recently, economists have preferred to use the *expectations-augmented* version of the Phillips relation:

$$w = f(U) + g\pi (0 < g \leq 1) \tag{4}$$

Where:  $\pi$  denotes the expected rate of inflation. The underlying idea of equation 4, as propounded by Friedman (1968), is that if an inflationary trend has been in effect long enough,

people are apt to form certain inflation expectations which they then attempt to incorporate into their money wage demands. Thus,  $w$  should be an increasing function of  $\pi$ . Carried over to 3, this idea results in the equation:

$$p = \alpha - T - \beta U + g\pi \quad (0 < g \leq 1) \quad 5$$

With the introduction of a new variable to denote the expected rate of inflation, it becomes necessary to hypothesize how inflation expectations are specifically formed. Here we adopt the *adaptive expectation hypothesis*

$$\frac{d\pi}{dt} = j(p - \pi) \quad (0 < j \leq 1) \quad 6$$

Note that, rather than explain the absolute magnitude of  $\pi$ , this equation describes instead its pattern of change over time. If the actual rate of inflation  $p$  turns out to exceed the expected rate  $\pi$ , the latter having now been proven to be low, is revised upward ( $d\pi/dt > 0$ ). Conversely, if  $p$  falls short of  $\pi$ , then  $\pi$  is revised in the downward direction. In format, equation 6 closely resembles the adjustment mechanism  $dP/dt = j(Q_d - Q_s)$  of the market model. But here the driving force behind the adjustment is the discrepancy between the *actual* and *expected* rates of inflation, rather than  $Q_d$  and  $Q_s$ .

Equations 5 and 6 can be considered as constituting a complete model. More significantly, this will provide us with the opportunity to take into account the feedback effect of inflation on unemployment. Equation 5 tells us how  $U$  affects  $p$  – largely from the supply side of the economy. But  $p$  surely can affect  $U$  in return. For example, the rate of inflation may influence the consumption-saving decisions of the public, hence also the aggregate demand for domestic production, and the latter will, in turn, affect the rate of unemployment.

Even in the conduct of government policies of demand management, the rate of inflation can make a difference in their effectiveness. Depending on the rate of inflation, a given level of money expenditure (fiscal policy) could translate into various levels of real expenditure, and similarly, a given rate of nominal money expansion (monetary policy) could mean varying rates of real-money expansion. And these, in turn, would imply differing effects on output and unemployment.

For simplicity, we shall take into account the feedback of inflationary recession (stagflation) through the conduct of monetary and fiscal policies – based on the assumption that inflation is an increasing function of unemployment. Both monetary and fiscal measures alone are insufficient in controlling stagflation. They are supplemented by non-monetary and non-fiscal measures, otherwise called physical measures. Thus:

Where

- STA = Stagflation (Inflation + Unemployment)
- MP = Monetary policy
- FP = Fiscal Policy
- OM = Other measures

Monetary policy can be proxied by money supply, inflation rate, and exchange rate which represent CBNs internal and external balance measures. Fiscal policy on the other hand is executed using government expenditure and taxation. The other measures aimed at increasing aggregate supply and curbing stagflation directly are increasing GDP, increasing savings, and increasing consumer spending. Thus, to combat stagflation, a vast spectrum of policy measures is needed. Substituting these proxies into equation 7, the functional form of the model is stated as:

$$DI = f (MS, INF, EXR, GEX, TAX, GDP, SAV, CEX) . . . . . 8$$

The econometric form of the model is specified as:

$$DI = \alpha_0 + \alpha_1 MS + \alpha_2 INF + \alpha_3 EXR + \alpha_4 GEX + \alpha_5 TAX + \alpha_6 GDP + \alpha_7 SAV + \alpha_8 CEX + \mu$$

3.11

Where

- DI = Discomfort Index
- MS = Money Supply
- INF = Inflation Rate
- EXR = Exchange Rate
- GEX = Government Expenditure
- TAX = Total Tax Revenue
- GDP = Gross Domestic Product
- SAV = Total Savings
- CEX = Consumption Expenditure
- $\alpha_0 - \alpha_8$  = Parameters to be estimated, and
- $\mu$  = Stochastic term

Note: *Discomfort Index* is the best measure of stagflation and is computed as:

$$DI = \frac{\text{Inflation+Unemployment}}{\text{Implicit Price Deflator}}$$

On a priori basis, it is expected that these variables are expected to combat inflation and reduce unemployment in Nigeria. Thus, there should be a negative

relationship between the dependent and independent variables. In other words, an increase in MS, INF, EXR, GEX, TAX, GDP, SAV and CEX is expected to significantly reduce stagflation in Nigeria. Symbolically, it is expected that:

$$\alpha_1 - \alpha_8 < 0.$$

### 3.2 Method of study

The ordinary least square (OLS) technique is used to examine the efficacy of monetary and fiscal policies in combating the paradox of inflationary recession in Nigeria. The model is estimated using data gotten from 1971 – 2015. This time period is chosen because it underlies the era covering the emergence of inflationary recession in the world. Thus, it gives a picture of the root of this phenomenon in Nigeria whether or not it coincides with the aforementioned period. Regression analysis is used to measure the cause-effect relationship of the data series, to obtain plausible numerical estimates of the parameters, and to give empirical content to the estimated function. This data is sourced from CBN Statistical Bulletin and the Annual Abstract of Statistics from National Bureau of Statistics (NBS).

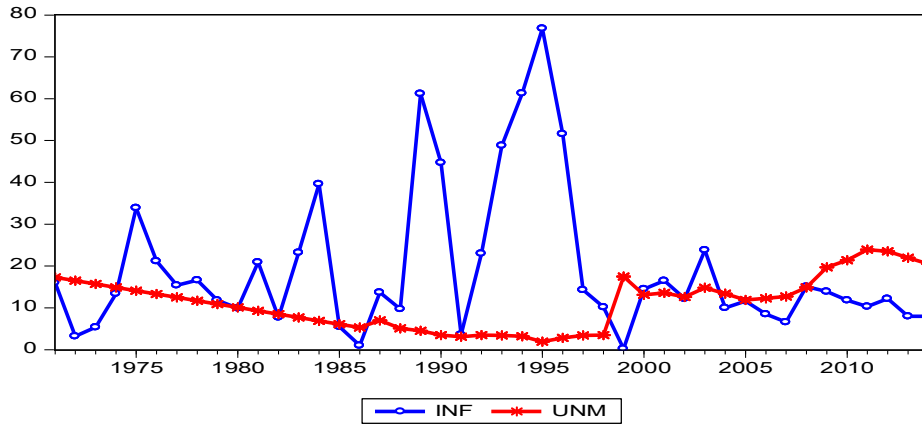
## 4. Results and Discussion

### 4.1 Trend of stagflation in Nigeria

Prior to the 1930s, most economists believed that macroeconomic objectives could be best achieved through the operation of the price mechanism. Based on the idealised model of the market system, the classical believed – which is now a general consensus, that the rate of price inflation should be moderate (3% or less) and there should be a low level of unemployed factors of production (3% or less). However, it is necessary to examine its practicability in the real world. The graph below shows the trend of inflation and unemployment in Nigeria to investigate the level of their respective fluctuation.

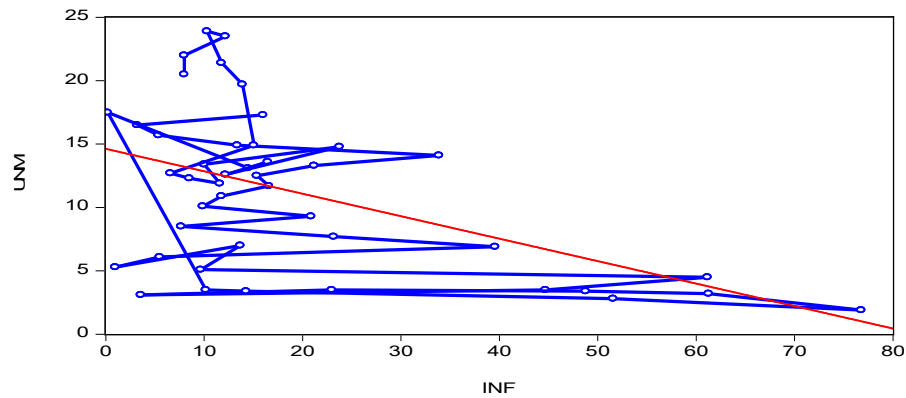
Figure 2 shows the trend of inflation and unemployment in Nigeria. The graph reveals that the trend of inflation and unemployment in Nigeria has been quite unstable over the study period. Inflation threshold has been highly volatile ranging between 0.2% (1999) and 76.8% in 1995. The time path of inflation follows no systematic pattern– showing upward and downward trends across the 45-year period. Unemployment has been more stable compared to inflation. The decade 1971–1980 witnessed double digits in unemployment rates, which became a downturn in the following decade. From 1981 – 1993, unemployment recorded a single digit rate even as low as 1.9% in 1995 – same year that inflation recorded its

highest in Nigeria. The succeeding period retrogressed back to double digits inching 21.4% in 2010, which has continued to be endemic in Nigeria.



**Figure 2: The trend of Inflation and unemployment in Nigeria (1971 – 2015)**

Source: Eviews 9 output, 2017.



**Figure 3: The Phillips curve for Nigeria**

Source: Eviews 9 output, 2017.

Figure 3 shows the inflation-unemployment nexus in Nigeria to determine if or otherwise, the Phillips curve fits the Nigerian data. The graph exhibits irregular fluctuations. The Nigerian Phillips curve clearly depicts that both inflation and recession have both positive and negative relationships. The data reveals that in some years inflation had an inverse relationship with unemployment while in other years, they increased simultaneously. The trend thus reveals that the Phillips curve relationship is inverse in Nigeria as the data does not fit the Phillips line. Thus,

there is need to empirically investigate this relationship vis-a-vis its response to monetary and fiscal policies in Nigeria.

In order to avoid nonsensical regression estimates which may lead to spurious results, the data is subjected to unit root test to examine the stationarity of the data series. The result of the Augmented Dickey-Fuller (ADF) test is presented table 1.

**Table 1: Results of the stationarity test**

Variable	ADF Test Statistic	1% Critical Value	5% Critical Value	10% Critical Value	Prob.	Order of Integration
DI	-6.97	-3.60	-2.94	-2.61	0.0000	I(1)
MS	-8.74	-3.59	-2.93	-2.60	0.0000	I(1)
INF	-7.18	-3.61	-2.94	-2.61	0.0000	I(1)
EXR	-5.79	-3.60	-2.93	-2.60	0.0000	I(1)
GEX	-3.74	-3.61	-2.94	-2.61	0.0070	I(1)
TAX	-4.57	-3.60	-2.94	-2.61	0.0065	I(1)
GDP	-4.14	-3.60	-2.93	-2.60	0.0023	I(1)
SAV	-4.53	-3.60	-2.94	-2.61	0.0057	I(1)
CEX	-4.30	-3.60	-2.93	-2.60	0.0014	I(1)

Source: Eviews9 Output, 2017.

**Table 2: Co integration Test**

Null Hypothesis	Trace Statistic	0.05 Critical Value	Null Hypothesis	Max-Eigen Statistic	0.05 Critical Value
$r = 0^*$	640.32	197.37	$r = 0^*$	223.56	58.43
$r \leq 1^*$	416.76	159.53	$r \leq 1^*$	173.07	52.36
$r \leq 2^*$	243.69	125.62	$r \leq 2^*$	91.37	46.23
$r \leq 3^*$	152.32	95.75	$r \leq 3^*$	58.26	40.08
$r \leq 4^*$	94.05	69.82	$r \leq 4^*$	42.43	33.87
$r \leq 5^*$	51.62	47.86	$r \leq 5^*$	27.95	27.58
$r \leq 6$	23.67	29.80	$r \leq 6$	15.00	21.13
$r \leq 7$	8.66	15.49	$r \leq 7$	8.00	14.26
$r \leq 8$	0.66	3.84	$r \leq 8$	0.66	3.84

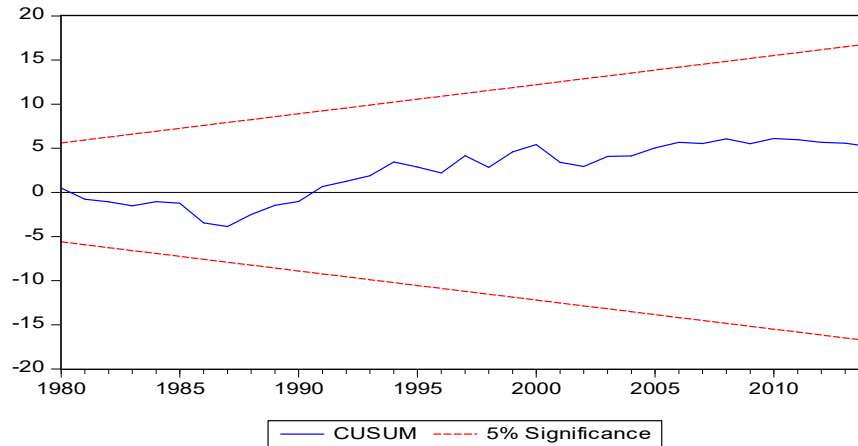
Source: Eviews9 Output, 2017.

Note: r represents number of co integrating vectors. Both Trace statistic and Max-Eigen statistic indicates 6 co integrating equation each. \* denotes rejection of the hypothesis at the 0.05 level

The ADF statistic values for DI, MS, INF, EXR, GEX, TAX, GDP, SAV and CEX are -6.97, -8.74, -7.18, -5.79, -3.74, -4.57, -4.14, -4.53 and -4.30 respectively. The associated one sided p-values (for 45 observations) are less than 0.05. The result also shows that the statistic  $t_\alpha$  value is greater than the critical values at 1%, 5%, and 10% for all the variables, so we reject the null hypothesis at the conventional test size. Thus, the variables are stationary at first difference series. The finding that the macro time series contains a unit root has spurred the nonstationary time series analysis. Engle and Granger (1987) pointed out that a linear combination of two or more non stationary time series may be stationary. If such a stationary linear combination exists, the nonstationary time series is said to



be cointegrated. The stationary linear combination may be interpreted as a long run equilibrium relationship between the variables. The Johansen system framework is employed to test for the presence of cointegrating relationships among the nonstationary variables. The result is presented in table 2.



**Figure 4: CUSUM test**

Source: Eviews8 Output, 2016.

The trace test and Max-Eigen value test show a long run equilibrium relationship between the variables. Thus, the null hypothesis of no cointegrating equation is rejected, since their statistics are greater than their respective critical values for the cointegrating equations at 5% significance level. This implies a stationary linear combination; hence, the non-stationary time series are cointegrated. The application of the OLS technique will therefore yield informative, non-spurious and dependable results. The cumulative sum of the recursive residuals shows that there is stability in the equation within the sample period. The result is shown figure 4. Movement of recursive residuals inside the critical lines is suggestive of coefficient stability. This further substantiates the long run equilibrium relationship between the variables.

#### 4.2.1 *Effect of Monetary and Fiscal Policies on Inflationary Recession in Nigeria*

The estimated model is given as:

$$DI = \alpha_0 + \alpha_1 MS + \alpha_2 INF + \alpha_3 EXR + \alpha_4 GEX + \alpha_5 TAX + \alpha_6 GDP + \alpha_7 SAV + \alpha_8 CEX + \mu$$

The numerical values of the theoretical parameters are given in table 3.

**Table 3: Regression Analysis**

<i>Variable</i>	<i>Coefficient</i>	<i>Standard Error</i>	<i>T Statistic</i>	<i>Prob.</i>
<i>Regression Estimates</i>				
C	0.93	1.34	0.69	0.4926
MS	0.01	0.01	1.32	0.1953
INF	0.01	0.01	1.29	0.2033
EXR	0.02	0.01	2.19	0.0354
GEX	-0.95	0.53	-1.79	0.0824
TAX	-0.51	0.572	-0.99	0.3303
GDP	-0.50	0.79	-0.63	0.5315
SAV	-0.40	0.47	-0.85	0.3986
CEX	1.59	0.54	2.96	0.0054
<i>Diagnostic Statistic</i>				
R <sup>2</sup>	0.67	F <sub>0.05</sub>	2.18	
Adj. R <sup>2</sup>	0.60	DW	1.39	
F*	9.24	D <sub>L</sub>	1.139	
Prob (F Stat)	0.0000	D <sub>U</sub>	1.958	

Source: Eviews8 Output, 2016.

Table 3 is the regression model. It shows that 0.01 is the partial regression coefficient of MS and tells us that with the influence of INF, EXR, GEX, TAX, GDP, SAV and CEX held constant, as MS increases, say, by one percent, on average, stagflation goes up by 0.01 percent. Similarly, the coefficient of INF suggests that, other variables held constant, a 1% change in inflation will increase stagflation by 0.01%. Furthermore, the coefficient of EXR shows that any fluctuation in the naira by say, 1% will cause stagflation to increase by 0.03%. From the model, government expenditure has great impact on stagflation than. The coefficient of -0.95 suggests that a ₦1 billion increase in GEX, on average, other things being equal, will engender a 0.95% decrease in stagflation.

The coefficient -0.51 tells us that holding the influence of other variables constant, on average, stagflation decreases by about 0.50% as tax revenue increases by ₦1 billion. SAV also shows a negative impact on stagflation. Its coefficient of -0.40 implies that, ceteris paribus, on average, stagflation will fall by 0.40% if SAV increases by ₦1 billion. An increase in GDP constrains inflationary recession as shown in the empirical model. It shows that if GDP goes up by ₦1 billion, inflationary recession falls by 0.50%. CEX in the model is the major cause of stagflation in Nigeria as the result shows that a ₦1 billion increase, on average, will increase the level of stagflation by 1.59%. The intercept value of 0.93 means that if the values of MS, INF, EXR, GEX, TAX, GDP, SAV and CEX were fixed at zero, the average level of stagflation in Nigeria would rise by 0.74%.

The coefficients of four of the explanatory variables conform to a priori having the expected negative signs showing there is an indirect relationship between GEX, TAX, GDP SAV and Stagflation. The coefficients of the other four

variables do not conform to a priori displaying positive signs implying there is a direct relationship between MS, INF, EXR, CEX and Stagflation. Under the null hypothesis that the true population value of each regression coefficient individually is zero, we find that the  $p$  values of EXR and CEX are not statistically different from zero. This implies that the probability of obtaining a  $t$  value or greater for EXR (0.02) and CEX (1.59) are 0.0354 and 0.0054, which is practically zero. This means that the coefficients of EXR and CEX are statistically significant. The  $p$  values of the other variables are statistically different from zero. It shows that the probability of obtaining a  $t$  value or greater for MS (0.01), INF (0.01), GEX (0.95), TAX (0.51), GDP (0.50), and SAV (0.40) is 0.3792 for MS, 0.2239 for INF, 0.0967 for GEX, 0.3840 for TAX, 0.7602 for GDP, and 0.3690 for SAV, which is significantly different from zero. This means that the coefficients of MS, INF, GEX, TAX, GDP, and SAV are not statistically significant within the study period.

The study also finds out that MS, INF, EXR, GEX, TAX, GDP, SAV and CEX are jointly significant. The  $F$ -statistic shows the overall significance of the estimated regression line. The result reveals that the  $p$  value of obtaining an  $F$  value of as much as 9.24 or greater is simultaneously equal to zero, leading to the rejection of the hypothesis that together MS, INF, EXR, GEX, TAX, GDP, SAV and CEX have no effect on inflationary recession in Nigeria. The adjusted  $R^2$  value of 0.60 means that about 60% of the variations in inflationary recession is explained by MS, INF, EXR, GEX, TAX, GDP, SAV and CEX. This is fairly strong considering that the maximum value of  $R^2$  can at most be one (1). This shows that our regression line moderately fits the data. The coefficient of about 0.60 shows that money supply, inflation rate, exchange rate, government expenditure, tax revenue, gross domestic product, total savings, consumption expenditure, and inflationary recession are strongly positively correlated.

The Durbin-Watson  $d$  test of autocorrelation shows the absence of serial correlation. The aggregate demand model shows the estimated  $d$  value to be 1.39,  $d_L = 1.139$  and  $d_U = 1.958$  at the 5 percent significance level. Since the computed  $d$  value of 1.74 lies between the lower limit ( $d_L$ ) and the upper limit ( $d_U$ ) (i.e.  $d_L \leq d \leq d_U$ ), there is inconclusive evidence regarding the presence or absence of positive first order serial correlation.

## **5. Conclusion and Recommendations**

The study reveals that monetary and fiscal policies are not significant in curbing inflationary recession in Nigeria and needs to be re-examined. The moderate relationship between the variables (proxying these policies) suggests that there is

still weak complementarity between monetary and fiscal policy in Nigeria. Comparatively, fiscal policy seems more effective than monetary policy in reducing economic stagnation and inflation threshold in Nigeria. Government expenditure and tax revenue posit the expected negative relationship with stagflation and have higher magnitude while money supply, inflation rate and exchange rate are contrary to this expectation with lower magnitude. This shows that fiscal policy has not achieved its mandate of re-enforcing and complementing monetary policy. The magnitude of output, savings and consumption expenditure also shows that the other measures exert more influence on stagflation than monetary policy. Consumption expenditure from the results contributes more to spurring stagflation in Nigeria than other variables. The significance of exchange rate shows that monetary policy variables buttress more effectiveness towards external balance measures than internal stability. Thus, the Philips relationship appears to be inverse in the Nigerian economy and the feedback of stagflation based on its response to monetary and fiscal policies appears to be weak. Based on the findings and conclusion, the study therefore recommends that:

1. The fiscal authority should complement the monetary authority by providing a good regulatory environment that will encourage the appropriate conduct of monetary policy in Nigeria.
2. To reduce inflationary recession, fiscal policies should be focused on the objective of easing labour market conditions and increasing productivity.
3. The government and private sectors should channel their consumption expenditures toward the real sector for inclusive growth.
4. Finally, to buffer internal balance measures of monetary policy, the monetary authority should avoid rapid changes in the rate of monetary growth as this would lead to variations in the rate of inflation.

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