Effects of Inflation Rate on Economic Growth in Nigeria (1986-2014)

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Abstract

This paper investigates the effects of inflation on economic growth in Nigeria between 1986 and 2014; secondary data culled from CBN Statistical Bulletin (2014) were used for the study. The Augmented Dickey-Fuller technique was adopted to test the unit root property of the series while Granger causality was used to test the causation between GDP and inflation.

The objectives of the study are to: describe the trend of inflation in Nigeria over the years under review: to determine the effect of inflation on economic growth and to proffer policy recommendations based on the findings of the study.

The result of table 1 shows that R^2 is 0.147. This implies that about 14 percent in total variation in dependent (economic growth) is being explained by explanatory variable (inflation rate). The coefficient of inflation rate is negative; this implies that a percentage increase in inflation rate will lead to 27 percent reduction in economic growth. However, the inflation rate is significant at 5 percent. The constant is statistically significant at 1% implies that GDP does not only depend on inflation but other variables may affect GDP. The F-statistics of 4.68, which is a measure of the joint significance of the explanatory variables, is found to be statistically significant at 5% as indicated by the corresponding probability value 0.0394. The Adjusted R^2 0.116 (11.6%) implies that 11.6 percent total variation in GDP is explained by the regression equation. Coincidentally, the goodness of fit of the regression remained too low after adjusting for the degree of freedom. The results of unit root suggest that all the variables in the model were stationary at 1%, 5% and 10% critical values with first difference. The results of Causality suggest that GDP causes inflation and not inflation causing Growth. The results also revealed that inflation had a negative impact on economic growth.

The study also showed that inflation possessed a positive impact on economic growth through encouraging productivity and output level and on evolution of total factor productivity. A good performance of an economy in terms of per capita growth may therefore be attributed to the rate of inflation in the country. A major policy implication of this result is that concerted effort should be made by policy makers to increase the level of output in Nigeria by improving productivity/supply in order to reduce the prices of goods and services (inflation) so as to boost the growth of the economy.

Keywords: Inflation, economic growth and development (GDP).

1. Introduction

The word inflation rings a bell in the market economies of the world; it is a 'monster' that threatens all economies because of its undesirable effects. The problem of inflation surely is not a new phenomenon; it has been a major problem in the country over the years. To attain sustainable economic growth coupled with price stability continues to be the central objective of macroeconomic policies for most countries in the world today. Among others the emphasis given to price stability in conduct of monetary policy is with a view to promoting sustainable economic growth as well as strengthening the purchasing power of the domestic currency (Umaru and Zubairu, 2012). The question on whether or not inflation is harmful to economic growth has recently been a subject of intense debate to policy makers and macro economists. Several studies have estimated a negative relationship between inflation and economic growth. Specifically the bone of contention is that whether inflation is necessary for economic growth or it is detrimental to growth. Basically the rate of economic growth depends primarily on the rate of capital formation and the rate of capital formation depends on the rate of savings and investment (Datta and Kumar, 2011).

World economic growth and inflation rates have been fluctuating. Likewise, inflation rates have been dominating

to compare with growth rates in virtually many years (Madhukar and Nagarjuna, 2011) and relationship between inflation and the economic growth continued to be one of the most macroeconomic problems. Similarly, Ahmed (2010) maintains that this relationship has been argued in various economic literatures and these arguments shown differences in relation with the condition of world economy order. In accordance with these policies, increases in the total demand caused increases in production and inflation too. However, inflation was not regarded as a problem in that period rather considered as a positive impact on the economic growth which was widely accepted. Amid these views, Phillips first introduced hypothesizes that high inflation positively affects the economic growth by lowering unemployment rates. In 1970s, countries with high inflation especially the Latin American countries begun to experience a decrease in growth rates and thus caused the emergence of the views stating that inflation has negative effects on the economic growth instead of the positive effects. Evidence showing relationship between inflation and economic growth from some of the Asian countries such as India showed that the growth rate of Gross Domestic Product (GDP) in India increased from 3.5% in the 1970s to 5.5% in the 1980s while the inflation rate accelerated steadily from an annual average of 1.7% during the 1950s to 6.4% in the 1960s and further to 9.0% in the 1970s before easing marginally to 8.0% in the 1980s (Prasanna and Gopakumar, 2010).

Nigeria economy experienced many internal and external shocks. All sectors of the economy were affected by shocks, whose manifestations were, among others, large budget deficits and an imbalance between productive and non-productive activities. The signs closely associated with these were high rates of inflation, large balance of payments (BOP) deficits, declining domestic savings, growing government expenditure, falling produce and decreased utilization of industrial capacity which in turn hindered economic growth.

There have been extensive theoretical and empirical researches to examine the relationship between inflation and economic growth in Nigeria countries. The Nigeria economy has undergone fundamental structural changes over the last five decades. Evidences show that the dramatic structural shifts that occur did not result in any appreciable and sustained economic growth and development. The economy exhibit negative growth rates which indicates depressed economic situation partly caused by the world wide economic recession of the early 80s, and partly by over dependence of the Nigeria economy on oil proceeds and gross mismanagement of the economy by successive governments (Biobaku, 2004).

A central objective of Nigeria's macroeconomic policies is to promote economic growth and to keep inflation on a low level. However, in recent years there has been substantial debate on the relationship between inflation and economic growth. Some scholars, mainly those in favor of the Keynesian perspective tend to believe that inflation is not harmful to economic growth whereas other scholars particularly those in favor of monetarist views, argue that inflation is harmful to economic growth. Some findings say that there is significant short-run relationship but not in the long-run (Datta and Kumar, 2011). Hence, this study seeks to investigate the effect of inflation on economic growth of Nigeria.

Hypothesis

Ho: There is no significant relationship between inflation rate and economic growth.

HA: There is a significant relationship between inflation rate and economic growth.

2. Review of Related Literature

The performance of any economy can be accessed through the stability of certain economic indicators such as the rates of interest and the rate of inflation.

According to Awokiyesi, (1999), the aim of every economy is the attainment of a healthy and sustainable position for the critical macro economic variables, which are the balance of payment (BOP), Gross Domestic Product (GDP), Inflation and Unemployment. The pursuits of these goals have become one of the major pre-occupations of policy maker worldwide. This is understandable due to the tremendous impact of developments in Balance of payment (BOP), inflations, GDP and unemployment on the social welfare of the society. Generally, the outcome of these critical macro-economic variables provides a useful guide for appraising the appropriateness current policy measures designed to bring about a well ordered economic structure.

The objectives of macro-economic policy for the government of a contemporary mixed capitalist country (like Nigeria) have come to be formulated as the maintenance of high employment levels, low level of inflation and the achievement of adequate rate of economic growth and the preservation of balance of payments equilibrium.

According to the Phillips Curve, two major goals of interest to economic policy makers are low inflation and low unemployment, but quite often, these goals conflict. The adoption of monetary and/or fiscal policy moves the

economy along the short-run aggregate supply curve to a point of higher price level. As higher output is recorded, this is followed by lower unemployment, as firms need more workers when they produce more and vice-versa. This trade-off between inflation and unemployment is described as the Phillips curve. This was an empirical discovery by Phillips (1958), which showed an inverse relationship between wage and unemployment rates, using United Kingdom data plotted over the period 1862-1957. The discovery is strengthened by the fact that movement in the money wages could be explained by the level and changes of unemployment. An argument in favor of the Phillips curve is the extension that establishes a relationship between prices and unemployment. This rests on the assumption that wages and prices move in the same direction. The strength of the Phillips curve is that it captures an economically important and statistically reliable empirical relationship between inflation and unemployment.

In the aftermath of the recent global financial crisis in 2008, inflation gained momentum in Nigeria. Inflation remained higher and persisted at above the comfort level of the Central Bank of Nigeria. The debate of growth-inflation trade-off and the role of monetary policy reappeared and have once again acquired center stage of recent policy debate. The conventional view influenced mostly by the short run Phillips Curve, subscribed that higher inflation tolerance could yield higher growth against the view that inflation itself is a risk to growth beyond a level.

Monetary policy ensures that inflation remains low and stable over time contributes to long-run economic growth and financial stability (Bernanke, 2011). Low and stable inflation improves the functioning of the markets, making them more effective at allocating resources. It also allows households and businesses to plan for the future without having to be unduly concerned with unpredictable movements in the general level of prices. Therefore, price stability with growth is the prime objective for any central bank. This means central banks try to achieve low and stable inflation and high output growth through their monetary policy. Much of the research on growth-inflation nexus had tried to address three key questions: (i) Is there a robust negative relationship between inflation and growth? (ii) Is there a relationship such that, at low levels of inflation, the relationship is positive? (iii) Does inflation have to reach some minimum threshold before the growth effects turn adverse?

All these questions suggest the possibility of a non-linear relationship between inflation and output growth. If such a non-linear relationship exists, then it should be possible to estimate the inflexion point, or threshold, at which the sign of the relationship between inflation and growth would switch. Inflation beyond the threshold level makes growth costly and calls for policy changes.

The Keynesian opposed the monetarists' view of direct and proportional relationship between the quantity of money and prices. According to this school, the relationship between changes in the quantity of money and prices is non-proportional and indirect, through the rate of interest. The strength of the Keynesian theory is its integration of monetary theory on the one hand and the theory of output and employment through the rate of interest on the other hand. Thus, when the quantity of money increase, the rate of interest falls, leading to an increase in the volume of investment and aggregate demand, thereby raising output and employment. In other words, the Keynesians see a link between the real and the monetary sectors of the economy an economic phenomenon that describes equilibrium in the goods and money market (IS-LM). Equally important about the Keynesian theory is that they examined the relationship between the quantity of money and prices both under unemployment and full employment situations. According, so long as there is unemployment, output and employment will change in the same proportion as the quantity of money, but there will be no change in prices. At full employment, however, changes in the quantity of money will induce a proportional change in price. Olofin (2001) thus, this approach has the virtue of emphasizing that the objectives of full employment and price stability may be inherently irreconcilable.

Several recent empirical studies have examined the growth-inflation relationship in a non-linear framework using long annual cross-country data specifically looking at the change in the relationship between inflation and growth below and above a threshold.

Sergii, (2009) found that growth - inflation interaction was strictly concave with some threshold level of inflation. Inflation threshold level is estimated using a non-linear least squares technique, and inference made by applying a bootstrap approach. The main findings were that inflation rate above 8 percent tend to slow down economic growth while below 8 percent promotes economic growth. Espinoza et al. (2010) examined threshold effect of inflation on GDP Growth by using a panel data of 165 countries including Oil Exporting Countries and Azerbaijan over the period of 1960-2007. Their study found that for all country groups' threshold level of inflation for GDP growth was about 10 percent (with the exclusion of industrialized countries where threshold level was much lower). Estimated results suggested that inflation from higher than 13 percent decreases real non-oil GDP by 207 percent per year. Lastly, review of literature on money supply and exchange rate influence on

economic growth and inflation. Mehari and Wondafrash, (2008) revealed that money supply had a direct impact on inflation.

3. Research Methodology

The method of analysis used was the econometric analysis with special focus on the regression analysis. This is because economic theory is mainly concerned with relationship between economic variables hence; this method of analysis helped to establish the relationship that exists between inflation rate and economic growth.

3.1 Nature and Sources of Data

The data used in this research work was mainly secondary data adopted from the publication of the Central Bank of Nigeria (CBN). The choice of secondary data was made since it is more accurate, cheaper to obtain and time saving. However, there is no doubt envisaged on the reliability of secondary data used, but, the possibilities of random errors were not neglected.

The data used for this research work covered a period of twenty nine (29) years between 1986 and 2014.

3.2 Method of Analysis

The regression analysis technique was used to determine the effect of inflation on economic growth

3.3 Model Specification

The model is as specified below

$$Y = \beta 0 + \beta 1 X1 + Ut$$

Where;

Y = Gross Domestic Product proxy for Economic Growth (Dependent Variable)

X1 = Inflation Rate (Independent variable)

β0= the intercept of the equation

β1= the co-efficient of Inflation Rate (independent variable)

Ut= the Stochastic Error Term

3.4 Apriori Expectation

On a Priori ground we would expect the coefficient of the equation β1 to be negative since high inflation rate is negatively related to the gross domestic product (GDP) i.e β1 < 0. But inflation rate cannot be 0, because people will not be motivated to invest. Therefore, a certain level of inflation rate is healthy to the economy.

4. Empirical Results

4.1 Trends of Inflation

The rate of inflation in Nigeria which was as low as 5.4 in 1986 rose to as high as 56.0 in the year 1988 but reduced to 50.5 in 1989 and dropped to 12.7 in the year 1991. It started to rise again and stood at 44.8 in 1992 and later rose to 57.0 in 1994 and reached the highest level during the period of this study which is 72.8 in 1995.

The inflation rate then started to fall and stood at 10.7 in 1997 and 6.9 in 2000 and then rose again, it rose to 12.9 in 2002 and later rose to 17.8 in 2005 and started to fall again. It fell to 5.4 in the year 2007 and started to rise again. It rose to 11.6 in 2008 and later rose to 13.7 in the year 2010. It then fell to 10.8 in the year 2011 and rose to 12.2 in 2012; it dropped to 8.0 in 2013 and rose to 8.3 in 2014 which is the last year of the period of this study. Thus, the trend of inflation rate in Nigeria has been fluctuating during the period of the study.

4.2 Regression Analysis

The result of table 1 shows that R^2 is 0.147. This implies that about 14 percent in total variation in dependent (economic growth) is being explained by explanatory variable (inflation rate). The coefficient of inflation rate is negative; this implies that a percentage increase in inflation rate will lead to 27 percent reduction in economic growth. However, the inflation rate is significant at 5 percent.

The constant is statistically significant at 1% implies that GDP does not only depend on inflation but other variables may affect GDP. The F-statistics of 4.68, which is a measure of the joint significance of the explanatory variables, is found to be statistically significant at 5% as indicated by the corresponding probability value 0.0394. The Adjusted R^2 0.116 (11.6%) implies that 11.6 percent total variation in GDP is explained by the regression

equation. Coincidentally, the goodness of fit of the regression remained too low after adjusting for the degree of freedom.

The Durbin-Watson statistics was 0.200 which is not in the neighborhood of 2 indicated the presence of positive autocorrelation; therefore, the unit root test became important to make the data to be stationary.

4.3 Unit Root Test

The results of the unit root tests in table 2 revealed that the two variables of the model were found to be stationary at 1 percent, 5 percent, and 10 percent level, which is indicated by ADF results at all levels less than the critical values in negative direction. The ADF value for GDP is -2.2831 and the critical values are -3.3734, -2.9907 and -2.6348 at 1, 5, and 10 percent respectively.

4.4 Granger Causality Test

The results of table 3 revealed that inflation does not Granger causes GDP, as indicated by the high probability value 0.96263. The results also revealed that GDP does Granger Cause inflation is accepted at 1% probability level (0.08595) and this is confirmed by the F-statistics value of 2.74. This result therefore indicates one-way causation flowing from GDP to inflation. Therefore, the alternative hypothesis is accepted meaning that there is unidirectional relationship between the Gross Domestic Product (GDP) and inflation.

5. Summary of Findings and Conclusion

This paper investigated the effects of inflation on economic growth in Nigeria through the application of Augmented Dickey-Fuller technique in testing the unit root property of the series and Granger causality test of causation between GDP and inflation.

The result showed that there was fluctuating trend in inflation rate during the period of the study. The results of unit root suggested that the two variables in the model were stationary at 1%, 5% and 10% critical value with first difference. The results of Causality suggest that GDP Granger cause inflation and not inflation causing GDP. The results concluded that inflation rate had a negative impact on economic growth of Nigeria.

The study concluded that there exists significant relationship between the Gross Domestic Product (GDP) and inflation during the period of study between 1986 and 2014.

5.1 Recommendations

Based on the findings of this study, the following recommendations are made:

On ground of inflation, high interest rate developed by liquidity of banks should be reduced to a tolerable level. This is to enable appreciable level investment to exist within the economy and in turn stimulate economic growth.

A good performance of an economy in terms of per capita growth may therefore be attributed to the rate of inflation in the country. A major policy implication of this result is that concerted effort should be made by policy makers to increase the level of output in Nigeria by improving productivity/supply in order to reduce the prices of goods and services (inflation) so as to boost the growth of the economy. Inflation can only be reduced to the barest minimum by increasing output level (GDP).

All factors which cause an increase in the general price levels in the economy such increase in money supply should be addressed with the appropriate policies so as to foster economic growth.

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Appendix

Table 1: Regression Result

Dependent Variable: LOGGDP
Method: Least Squares
Date: 03/12/15   Time: 11:49
Sample: 1986 2014
Included observations: 29

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	5.944736	0.154609	38.45013	0.0000
LOGINF	-0.273102	0.126192	-2.164177	0.0395

R-squared	0.147826	Mean dependent var	5.622759
Adjusted R-squared	0.116264	S.D. dependent var	0.240979
S.E. of regression	0.226537	Akaike info criterion	-0.065342
Sum squared resid	1.385618	Schwarz criterion	0.028954
Log likelihood	2.947456	F-statistic	4.683664
Durbin-Watson stat	0.200608	Prob(F-statistic)	0.039462

Table 2: Unit Root Test Results For LogGDP

ADF Test Statistic	-2.283186	1% Critical Value*	-3.7343
		5% Critical Value	-2.9907
		10% Critical Value	-2.6348

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LOGGDP,3)
Method: Least Squares
Date: 03/12/15   Time: 12:04
Sample(adjusted): 1991 2014
Included observations: 24 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LOGGDP(-1),2)	-3.403062	1.490488	-2.283186	0.0335
D(LOGGDP(-1),3)	1.087309	1.110155	0.979421	0.3391
D(LOGGDP(-2),3)	0.264732	0.473744	0.558808	0.5825
C	0.009914	0.012406	0.799177	0.4336

R-squared	0.703165	Mean dependent var	0.009583
Adjusted R-squared	0.658640	S.D. dependent var	0.103901
S.E. of regression	0.060705	Akaike info criterion	-2.614558
Sum squared resid	0.073703	Schwarz criterion	-2.418215
Log likelihood	35.37469	F-statistic	15.79252
Durbin-Watson stat	1.191243	Prob(F-statistic)	0.000017

Table 3: Causality Test Result

Pairwise Granger Causality Tests
Date: 03/12/15   Time: 12:14
Sample: 1986 2014
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Probability
LOGINF does not Granger Cause LOGGDP	27	0.03815	0.96263 R
LOGGDP does not Granger Cause LOGINF		2.74929	0.08595 A

R – Rejected

A – Accepted

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