INFLATION DYNAMICS AND INDUSTRIAL OUTPUT GAP IN NIGERIA

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Abstract

Rising costs of production in Nigeria in the past few decades has rendered the local industry less competitive than their international counterparts. Rational consumers in Nigeria have intelligently substituted expensive and poor quality made-in-Nigeria products for high quality and lowly priced imported products. A combination of poor patronage, rising cost of doing business and an unstable macroeconomic environment has contributed to a dozen recessions in the industrial sector in the last 30 years. A pertinent economic issue is the high rate of inflation in the country. This paper investigates the relationship between inflation and industry output gap in order to ascertain if the negative output gaps in the industry have been caused by strong inflationary pressures. Secondary data was derived from the CBN Statistical Bulletin 2016 between 1985 and 2016. The study used HP Filter technique to estimate the output gap. The Johansen Co-integration test and Vector Error Correction Model was used to determine the long run relationship between inflation and output gap. The study found that there exist a statistically insignificant long run positive relationship between inflation and output gap. However, up to 78 percent of errors generated in the model due to a shock to inflation in the current period are corrected in the next period. The study recommends that policymakers need not take the rate of inflation into consideration when attempting to forecast changes in the output gap, however in the long run, an unstable inflation can contribute to the output gap, therefore inflation needs to be put in check.

Keywords: Inflation, Industrial Output, Output Gap, etc.

1 INTRODUCTION

Tiwari, Oros and Albulescu (2014) defined potential economic output as the output level in a situation of stable inflation. Therefore, in a situation where inflation is unstable, output could fail to reach its potential thereby causing what economists refer to as an output gap. To Justiniano, Primiceri, and Tambalotti (2013), an output gap is the difference actual and potential economic output which summarizes the efficiency of the use of economic resources in a nation. By potential output, we refer to the expected the level of production given the available human, capital and technology resources. When output gaps occur, either positive or negative, it means the economy is growing at an inefficient rate as economic resources are either underworked or overworked beyond its full potential (Mitra, Maheswari, & Mitra, 2011). For this reason, output gap could theoretically signal future inflationary pressures in an economy when output undershoots its potential or overshoots it.

A stable predictive relationship between inflation and the output gap which is often referred to as a Phillips curve provides the basis for countercyclical monetary policy in many models (Orphanides & Van Norden, 2003). A large output gap usually calls for a demand stimulus, while slow trend growth is more conducive to supply-side policies (Jarociński & Lenza, 2016). This means that policymakers tend to adopt a contractionary monetary policy to restrict aggregate demand in order to contain the acceleration in prices when a positive output gap results in inflationary pressures in market prices for economic output. Therefore, the assessment of current economic output from its potential economy is crucial for evaluating the inflationary pressures and determining the most appropriate economic policy mix for Central Banks all over the world (Jarociński & Lenza, 2016).

Theoretically, a situation where the productive capacity of the economy is underutilized – that is a positive output gap – increases the chances of the occurrence of a recession and vice versa. In order to avoid the negative economic consequences of output gaps, policy makers quickly initiate economic stabilization policies to get the economy progressing at an efficient pace. However, the effectiveness of such stabilization policies depends on numerous factors where if not present could cause should policies to fail to achieve its objective.

In Nigeria, the local industry has witnessed a total of 16 recessions in the last 35 years. During this period, inflation remained consistently high and volatile despite strategic monetary policy responses to the industry slowdowns. The median rate of inflation was 12 percent and the standard deviation was as high as 19.44. The high cost of locally made goods forced consumers to look for imported substitutes for the locally made products. By substituting domestic goods for foreign goods, consumer behavior may be one of the overarching factors that led to multiple recessions in the industry sector in the past three decades. This rationale thus expresses a possibility that output gap could be explained by inflation lags. This paper examines the effect of inflation on output gaps in Nigeria between 1985 and 2016.

Prior research in Nigeria has largely focused on the relationship between inflation and output with none discussing the link between output gap and inflation. Most empirical literature in the international domain has focused on the usefulness of output gap in forecasting future inflation. While there is a consensus that output gap is a fair predictor of future inflation, its predictive power and reliability depend on the estimation technique for obtaining the output gap and the model specification used in forecasting. This paper goes one step further to determine if current inflation can infact influence future output gap in an economy.

2 LITERATURE REVIEW

Orphanides and Van Norden (2003) analyzed the effectiveness of real time output gap in predicting inflation. Ouput gap were obtained using alternative univariate and multivariate estimates measures. They found that ex post output gap measures were fair predictors of inflation but real-time estimates of output gap were not able to reliably forecast inflation. Since inflation can hardly be predicted in real time, the operational usefulness of real time output gap-inflation models to policymakers is at best weak. They conclude that instead of output gaps, generally more reliable forecasts of inflation may be obtained by simply incorporating information from the growth rate of output. However, research suggested that instead of economic growth rate, changes in the stock of money relative to economic growth rate are more useful predictors of inflation rate.

Calza (2008) attempted to ascertain if globalization has increased the sensitivity of domestic inflation to global output gap in Europe. The study uses two different weighting schemes based o PPPs and trade data to measure global output gap. The study found that global output gap does not affect domestic prices in the euro area. The study concludes that the prescription that central banks should specifically react to developments in global output gaps does not seem to be justified for the euro area. However, Central Bank reaction to global output gap should be contextual rather than general as there may be countries in which changes in the global output gap can lead to variations in the country's inflation.

Mitra, Maheswari and Mitra (2011) examined the causal relationship between output gap and inflation in India. Using three different output gap estimates which were obtained using wavelet filtering, Hodrick Prescott filter and Seasonal ARIMA modeling techiques respectively, they found that there exists no granger causal relationship between any of the output gap estimates and inflation. Even though theoretically, there is a relationship between output gap and inflation, the fact that the output gap was derived using Index of Industrial Production rather than the GDP limited the ability of the industry output estimates exhibit any significant relationship with inflation which is a macroeconomic data and not an industry sector data.

Tiwari, Oros and Albulescu (2014) studied the relationship between inflation and output gap in France using the wavelet transform approach. The wavelet method helped to concurrently assess how variables are related at different frequencies and how such a relationship has evolved over time by capturing the non-stationary features. This is an improvement on similar studies which were done using the GMM approach which did not take into cognizant the non-stationarity of the variables over time. The study found that output gap is useful in predicting inflationary pressures in both short and medium term. Infact, the paper explained that since output gaps can predict 1 year future inflation, it is necessary for monetary policy to integrate discussions on output gap into their policy considerations. The main weakness in the paper is the adoption of the industrial production series as a proxy for GDP. In countries where industry represents only a small portion of the broad economy like Nigeria, such proxies may lead to false conclusions about the relationship between the economic output gap and inflation. Also the model proved inadequate as it failed to consider the influence of monetary policy on both short and long run inflation.

Jarociński and Lenza (2016) examined trends in output gap in the euro area using a small Bayesian dynamic factor model to explain the evolution of inflation during the period under review. Using different model specifications, they sought to find the best version to forecast real time inflation. They found that the version that forecasts inflation best implies that after the 2011 sovereign debt crisis the output gap in the euro area has been much larger than the official estimates. Versions featuring a secular-stagnation-like slowdown in trend growth, and hence a small output gap after 2011, do not adequately capture the inflation developments. However, since potential output is an unobservable trend component, the best version of output gap chosen does not necessary have to be a fair estimate of the actual output gap but one that exhibits the relationship with inflation the researcher hopes to find.

Edge and Rudd (2016) considered the revision properties of Federal Reserve Board staff estimates of the output gap after the mid-1990s and examine the usefulness of these estimates for inflation forecasting. Over this period, they found that the Federal Reserve's output gap is more reliably estimated in real time than previous studies have documented for earlier periods and alternative estimation techniques. In contrast to previous work, they also found no deterioration in forecast performance when inflation projections are conditioned on real-time rather than on final estimates of the output gap.

Onanuga, Tella and Osoba (2016) investigated the effect of output gap uncertainty on monetary policy decisions in Nigeria. Using the GARCH and GMM econometric techniques, they found that the uncertainty of real output gap and inflation significantly and negatively affects monetary policy rate in Nigeria. This further buttresses the point that Central Banks take the size of the output gap and the expected inflation into cognizance when making monetary policy decisions. However the study fails to recommend how the Central Bank can reduce the level of uncertainty in the output gap and inflation in order to improve monetary policy decisions.

Zhang, Ji and Dai (2017) examined the effect of globalization on increasing the sensitivity of inflation to the global output gap in China. The global output gap is measured by weighted output gap of China's top eighteen trading partners. Estimating Phillips curve models and vector autoregressive models, they found that global capacity constraints have both explanatory and predictive power for domestic consumer price inflation in China. They conclude that the central bank of China should react to developments in global output gaps. The findings in this paper are in contrast to the findings of Calza (2008), although it should be noted that the scope of study are in different economic regions.

3 METHODOLOGY

3.1 Theoretical Framework

To investigate the relationship between inflation and output gap, we rely on the Phillips curve. Philips (1958) describes a non-linear relationship between unemployment and inflation such that as unemployment begins to fall the money wage rate of labour begins to appreciate, thus exhibiting a negative relationship. Higher wages lead to a modest rise in the rate of inflation as aggregate demand expands due to a rise in employment of the labour force of the nation.

Put differently, we can assume that during periods of high unemployment, the rate of output is the economy trends downwards. A period of low employment leads to a negative output gap as the economy begins to grow at a less than efficient rate. Since the unemployed can continue to consume economic goods financed by their borrowings or savings, the fall in output quickly causes a price pressure on the scarce commodities. Manufacturers then react to the higher price by increasing output. But output can only be increased by employing additional units of labour. By putting for human and capital resources to work, the producers begin to narrow the previously wide output gap. The reverse tends to occur when prices fall in the market. Firms retrench workers to preserve their profit margins, thus leading to an underutilization of the human resources basically causing another output gap. Therefore we hypothesize that there is a realm of possibility- at least theoretically- that inflationary pressures could cause changes in the output gap.

3.2 Model Specification

We specify a reverse Phillips curve in a conventional vector error correction model for cointegrated series to describe the relationship between inflation and output gap as:

$$\Delta gap_t = \beta_0 + \sum_{i=1}^{n} \beta_1 \Delta gap_{t-i} + \sum_{i=0}^{n} \delta_i \Delta inf_{t-i} + \varphi Z_{t-1} + \mu_t \text{ .... (1)}$$

Where Δgap_t = change in output gap at time t

Δinf_{t-i} = change in the lagged values of inflation at time t

Z = Error correction term and the OLS residuals from following long run cointegrating regression.

Z can then be defined as:

$$Z_t = ECT_{t-1} = gap_{t-1} - \beta_0 - \beta_i inf_{t-1} \text{ .... (2)}$$

3.3 Data Sources

The study used secondary data between 1985 and 2016 from Central Bank Statistical Bulletin Real Sector Statistics 2016 to obtain data on industry output and CBN Statistical Bulletin Financial Statistics 2016 to obtain data on inflation rate for empirical analysis.

4 RESULTS

4.1 Unit Root Test

We take the unit root test to determine if the time series are stationary. This because the use of non-stationary time series data can lead to spurious results as such it is necessary to ascertain if the variables are non-stationary and correct the unit root problem if it exists. We use the Augmented Dickey Fuller Approach to test for unit root. If the series is found to be non-stationary at level, we then have to difference the series and test for its stationarity after the first difference. If the variables remain non-stationary after the first difference, then a second difference is necessary to ensure series stationarity.

Table 1: Unit Root Test Results for Stationarity of Variables

Variables	**ADF (Level)**	**Test Critical Values**	**ID**	**Remarks**
Lind	-2.15	-2.96	I(0)	Non-stationary
Inf	-1.11	-2.97	I(0)	Non-stationary

Source: Authors Compilation Using Eviews 7

From the table result above, we cannot reject the null hypothesis that industry output has a unit root because the ADF at levels is less than the test critical values at 5% level of significance. Therefore, we conclude that industry output is non-stationary at levels. Also, we cannot reject null hypothesis that inflation is non-stationary at levels because the ADF is less than the test critical values at 5% level of significance. We then conclude that inflation is also non-stationary at levels. To correct for the unit root problem, we must then take the difference of the series and test for stationarity.

Table 2:Unit Root Test Results for Stationarity of Variables after First Difference

Variables	**ADF (First Difference)**	**Test Critical Values**	**ID**	**Remarks**
Lind	-4.16	-2.96	I(1)	Stationary
Inf	-4.97	-2.97	I(1)	Stationary

Source: Authors Compilation Using Eviews 7

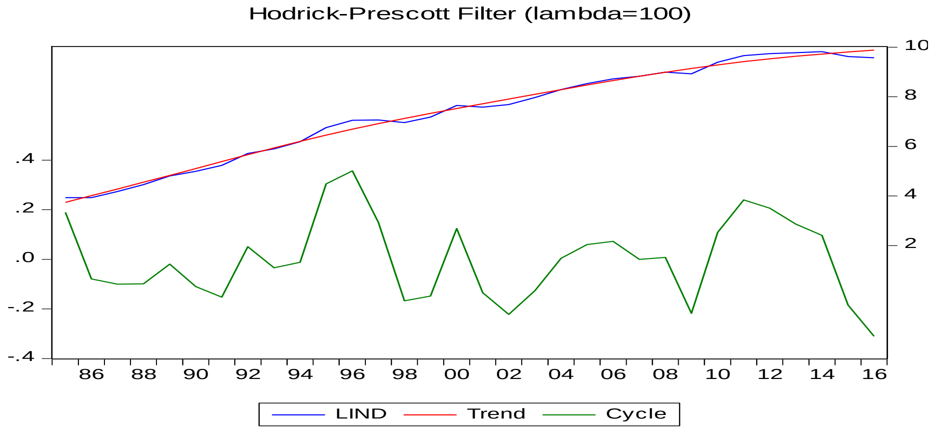
Note for Table 1 and 2: LIND and INF represent the logged values of Industry output and Inflation, respectively. We took the log of the variables to smoothen the data for ease of processing for HP filter. The logarithm of Inflation was not taken since both data are already in reported in percentage. ID represents the order of integration: I(0) stationary at levels and I(1) stationary after first difference.

From the table result above, we can reject the null hypothesis that industry output has a unit root because the ADF at levels is greater than the test critical values at 5% level of significance. Therefore, we conclude that industry output is stationary after first difference. Also, we can reject null hypothesis that inflation is not stationary at levels because the ADF is greater than the test critical values at 5% level of significance. We then conclude that inflation is also stationary after first difference. Since both variables are stationary after first difference, it is then possible to conduct a Johansen Cointegration test and vector error correction mechanism to determine the long run association between the variables.

4.2 Hodrick Prescott Filter

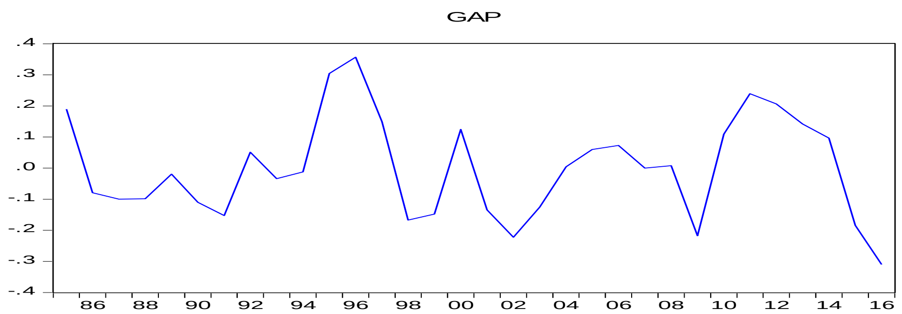
The HP filter is a univariate detrending technique used to determine the cyclical characteristics of the gross domestic product. The HP filter is used to extract the cyclical component from the trend component of the time series data. The cyclical component is then studied to determine frequency of cycles, the length of cycles and to examine that rarity of unusual deviation of the variable from its trend during particular periods. A deviation from the trend is known as an output gap.

Figure 1: Trend Component and Cyclical Component of the Industry Output (LIND)



Source: Authors Compilation Using Eviews 7

Figure 2: Industry Output Gap



Source: Authors Compilation Using Eviews 7

From the above figures, we find the industry output gap between 1985 and 2016. In figure 2, when the gap is positive, it means the industry output gap is positive and when the gap above is negative it means the industry output gap during those periods was negative. We can easily observe that the gap is very volatile in this series but for most periods, there is a negative output gap. A negative output gap means that the actual output is less than potential output or in other words, we say that industry is producing at rate that is less than its capacity due to the underutilization of its resources. The output gap can be influenced by many factors but for the sake of this study, we attempt to understand the relationship between the output gap and inflation.

4.3 Pairwise Correlation Coefficient

Table 3: Correlation of the Output Gap and Inflation

	GAP	INF
GAP	1	0.001042
INF	0.001042	1

Source: Authors Compilation Using Eviews 7

The result above shows that there is a very weak positive correlation between output gap and inflation. The correlation strength is 0.1%. This means that the rate of inflation and direction of the output gap almost do not move together. Still, we investigate further to ascertain their long run relationship.

4.4 Johansen Co-integration Test

When variables are integrated at the same order, we can run a Johansen cointegration test to determine if these variables have a long run relationship.

Table 4: Johansen Co-integration Result

Date: 12/07/17 Time: 13:20				
Sample (adjusted): 1987 2016				
Included observations: 30 after adjustments				
Trend assumption: No deterministic trend				
Series: GAP INF				
Lags interval (in first differences): 1 to 1				
Unrestricted Cointegration Rank Test (Trace)				
Hypothesized		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.387672	17.80829	12.3209	0.0055
At most 1	0.097983	3.093651	4.129906	0.093
Trace test indicates 1 cointegratingeqn(s) at the 0.05 level				
* denotes rejection of the hypothesis at the 0.05 level				
**MacKinnon-Haug-Michelis (1999) p-values				
Unrestricted Cointegration Rank Test (Maximum Eigenvalue)				

Hypothesized		Max-Eigen	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.387672	14.71464	11.2248	0.0117
At most 1	0.097983	3.093651	4.129906	0.093
Max-eigenvalue test indicates 1 cointegratingeqn(s) at the 0.05 level				
* denotes rejection of the hypothesis at the 0.05 level				
**MacKinnon-Haug-Michelis (1999) p-values				

Source: Authors Compilation Using Eviews 7

From the result above, we found that relying on either the Trace statistic or the maximum-eigen values, there is 1 cointegrating equation at 5% level of significance. Since their p-value is greater than 0.5, we can reject the null hypothesis and conclude that there is one cointegrating equation at 5% level of significance which indicates a long run relationship between output gap and inflation.

4.5 Normalized Co-integrating Coefficient

Table 5: Result for Normalized Co-integrating Coefficients

1 Cointegrating Equation(s):		Log likelihood	-107.459
Normalized cointegrating coefficients (standard error in parentheses)			
GAP	INF		
1	-0.00031		
	-0.00108		
	[0.28703]		
Adjustment coefficients (standard error in parentheses)			
D(GAP)	-0.76994		
	-0.20721		
D(INF)	-29.8657		
	-26.6504		

Source: Authors Compilation Using Eviews 7

The result of the normalized co-integrating coefficient is explained in the reverse of their signs. If the t-statistic is greater than 2, then its means that the variable is statistically significant at 5 percent level of significance. From the result we found that inflation has a positive but statistically insignificant relationship with the output gap such that as inflation rises, so does the output gap. However, the rate of inflation does not significantly influence the direction or size of the output gap.

4.6 Vector Error Correction Model (VECM)

The error correction term relates to the fact that last period deviation from long run equilibrium (the error) is influences the short run dynamics of the dependent variable. Thus, the coefficient of the ECT is the speed of adjustment, because it measures the speed at which Y returns to equilibrium after a change in X. The coefficient is expected to be between 0 and -1. If the coefficient is within the prescribed range and closer to -1 then it would mean that there is a meaningful correction of the errors in that equation as well as convergence of the variables in the long run.

Table 6: Vector Error Correction Model Result for the Model

Error Correction:	D(GAP)	D(INF)
CointEq1	-0.76934	-35.5283
	-0.28504	-33.973
	[-2.69904]	[-1.04578]

Source: Authors Compilation Using Eviews 7

From the result above, we found that that the speed of adjustment is statistically significant and lies between 0 and -1. We can then interpret the result and state that 76.9 percent of the errors generated in the current period will be corrected in the next period to restore equilibrium.

4.7 OLS Test

Dependent Variable: D(GAP)				
Method: Least Squares				
Date: 12/07/17 Time: 13:42				
Sample (adjusted): 1988 2016				
Included observations: 29 after adjustments				
D(GAP) = C(1)*(GAP(-1) - 0.000531373925508*INF(-1)) + C(2)*D(GAP(-1))				
+ C(3)*D(GAP(-2)) + C(4)*D(INF(-1)) + C(5)*D(INF(-2))				
	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	-0.76934	0.285041	-2.69904	0.0125
C(2)	0.420372	0.226294	1.857636	0.0755
C(3)	-0.02094	0.207799	-0.10075	0.9206
C(4)	-0.00066	0.001642	-0.40188	0.6913
C(5)	-7.05E-05	0.001622	-0.04348	0.9657
R-squared	0.360198	Mean dependent var		-0.00725

Adjusted R-squared	0.253564	S.D. dependent var		0.165947
S.E. of regression	0.143372	Akaike info criterion		-0.89116
Sum squared resid	0.493335	Schwarz criterion		-0.65542
Log likelihood	17.92178	Hannan-Quinn criter.		-0.81733
Durbin-Watson stat	1.917761			

Source: Authors Compilation Using Eviews 7

We carried out the OLS test using the structural equation above to obtain the p-value for the coefficients of the lagged values of the dependent variables and the coefficients of the independent variables which can help us determine if they are statistically significant at 5% level of significance or not. While C1 refers to the error correction term, C2 and C3 represent the coefficient of the lagged values of the dependent variable (output gap) and C4 and C5 represent the short run coefficients of the independent variable (inflation). We found that the short run coefficients of inflation are not statistically significant in explaining short run dynamics in output gap.

4.8 Wald Test

Test Statistic	Value	Df	Probability
F-statistic	0.08076	(2, 24)	0.9227
Chi-square	0.161521	2	0.9224

Source: Authors Compilation Using Eviews 7

We used the Wald Test to test the causality running between the inflation and output gap. From the result above we cannot reject the null hypothesis so we conclude that there is no short run causality running from inflation to output gap because the p-value of the chi-square is greater than 0.05.

4.9 Breusch-Godfrey Serial Correlation LM Test

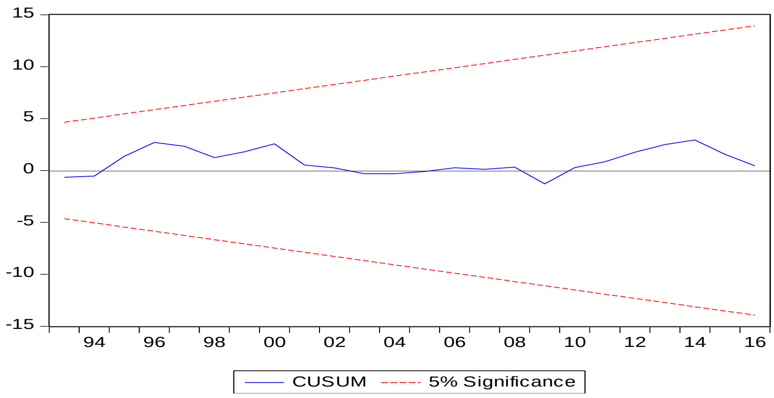
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	-2.47924	4.80645	-0.51581	0.6111
C(2)	-0.79564	1.133124	-0.70217	0.4899
C(3)	1.392341	2.262419	0.615421	0.5446
C(4)	-0.00127	0.002907	-0.43569	0.6673
C(5)	-0.00191	0.004094	-0.46661	0.6454
RESID(-1)	3.285652	5.882695	0.558528	0.5821
RESID(-2)	-0.13213	0.680184	-0.19426	0.8478
R-squared	0.042699	Mean dependent var		-0.00917
Adjusted R-squared	-0.21838	S.D. dependent var		0.132408

S.E. of regression	0.146153	Akaike info criterion		-0.80182
Sum squared resid	0.469935	Schwarz criterion		-0.47178
Log likelihood	18.6264	Hannan-Quinn criter.		-0.69846
Durbin-Watson stat	2.006585			

Source: Authors Compilation Using Eviews 7

The null hypothesis is that there is no serial correlation in the model. Since the p-value of the coefficients are greater than 0.05, we conclude that there is no presence of serial correlation at 5% level of significance in this model.

CUSUM Test



Source: Authors Compilation Using Eviews 7

The CUSUM test helps us to ascertain if our model is dynamically stable and our results are reliable. If the CUSUM line lies within the boundary at 5% level of significance then we can conclude that the model is dynamically stable and reliable. From the result above, we found that the CUSUM line lies within its boundary; we therefore conclude that the model is dynamically stable and reliable.

4.10 Discussion of Findings

From the results above, we observed that the correlation between output gap and inflation is weak so therefore a small movement in inflation cannot be a reliable signal to policy makers of a potential shift in the output gap in the economy. Although the long run relationship is positive, the predictive strength is statistically insignificant at 5% level of significance. However, what is most surprising is that errors created in the system that causes output gap to deviate from its path are generously corrected in the following periods to restore equilibrium. This means that when inflation shocks cause the output gap to deviate from its normal path, the economy is quick to recover in the next period, thereby causing a reversion to the mean for the output gap after every unexpected inflationary pressure. To policymakers, this means that policy inducement or stabilization policy may not be needed to cause economic recovery after a price shock in the economy leads to a recession or a rapid expansion in the economy since up to 76.9 percent of the errors generated during that period will automatically be corrected in the next period. Therefore policies must be focused at correcting the remaining 23 percent of errors that are not self-corrected by the economic system.

The results also show that short run dynamics in inflation are not useful in forecasting the output gap and that inflation does not cause output gaps in the short run. Therefore policies must rely on other metrics such as average capacity utilization to determine the expected level of the output gap instead of relying solely on inflation level for clues on the direction or size of the output gap.

5 CONCLUSION

5.1 Summary

Determining the factors that cause output gaps is essential to Central Banks so as to forecast changes in the output gaps and ascertain the necessary policies needed to reduce the gap to zero. There is an abundance of literature discussing how output gap drives inflation but very few literatures have evaluated the effect of inflation or rising prices on the output gap. This paper seeks to bridge that gap in knowledge. The paper studies the long run relationship between inflation and output gap. Secondary data was gathered from the Central Bank Statistical Bulletin 2016. The paper reversed the traditional Phillip curve model to describe the relationship between inflation and output gap.

Output gap was extracted from the difference between the trend components of industry output and the actual industry output using the Hodrick-Prescott Filter technique. The correlation strength between inflation and the output gap was then tested. The study found a weak but positive correlation between the variables. The two variables were stationary after second difference, thus paving the way for the Johansen Cointegration technique to be used to determine the long run relationship between inflation and output gap, after which the vector error correction mechanism was used to estimate the error correction term for the model. The study found that there exist a long run association but statistically insignificant relationship between the inflation and output gap and almost 80 percent of errors generated in the current period after a deviation or shock will be corrected in the next period. Still, using the Wald Test, the study found no causality between inflation and output gap which was in line with our earlier findings.

5.2 Conclusion

While it seemed very logical to expect that the output gap and inflation will have a high correlation, the results of the study show that the output gap and inflation in fact are not highly correlated. Rather the relationship is weak in the short run and insignificant in the long run. Still there is need to learn more about the relationship between output gap and inflation in order to improve monetary policy decisions. Theoretically, the output gap should indicate inflation but what was previously unknown the role of inflation in predicting future output gaps.

There is a need for more research to be done in this area to comprehend how inflation may cause changes in the output gap. This study found that there is a long run association between both variables even though the relationship is statistically insignificant. The study concludes that although inflation is not a fair signal of future output gap, there is still need to learn more about the factors that influence the output gap in order to effectively reduce the gap and get the economy of the nation growing at an efficient rate.

5.3 Recommendations

From our findings above, we recommend the following monetary policies:

1. Central Banks need not focus on inflation when analyzing the output gap.

2. Central Banks need not react to inflation changes to reduce the output gap; rather they should react to inflation changes to ensure price stability.

3. Stabilization policies to boost output or reduce output growth are necessary during periods of wide output gaps, excluding policies on price control to check inflation.

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