MONETARY POLICY AND UNEMPLOYMENT IN NIGERIA

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Abstract

This study investigated the link between monetary policy and unemployment in Nigeria from 1986 – 2016. Employing unemployment rate as the dependent variable and interest rate, monetary policy rate, foreign exchange rate, inflation rate and money supply as independent variables, the ordinary least square (OLS) estimation technique was used to check the relationship existing between these variables. The study revealed a link between unemployment and money supply, inflation rate and monetary policy rate. The Unit root test revealed that all variables were stationary at order one, the Johansen Co-integration test revealed a long run equilibrium relationship among the variables while the estimated error correction mechanism (ECM) revealed that 32 percent of disequilibrium is corrected for in the long run. Based on findings, the study recommended that as a control rate to other monetary variables, the monetary policy rate should be moderately placed; also, as a requirement for steady and continuous growth in investment necessary for the creation of jobs, price level and foreign exchange rate should be stable and low.

Keywords: Monetary Policy, Unemployment, Nigeria.

Introduction

The role of monetary policy in influencing macroeconomic objectives lies in the formulation and implementation strategies by the appropriate authorities . As an economic tool employed by the government to aid in the realisation of set out economic aims, monetary policy involves a combination of measures designed to regulate the values, supply and cost of money in an economy in conformity with the level of economic activity, for the purpose of achieving broad economic objectives such as price stability, balance of payment equilibrium, employment creation, output growth and sustainable development (Ajudua, Ojima & Okonkwo, 2015). The authorities do these manipulations by

targeting money supply and interest rate while putting into consideration the prevailing economic situation.

Monetary policy adopted is either expansionary or restrictive. An expansionary policy is employed in a situation where aggregate demand is low in relation to the capacity of the economy to produce goods and services while restrictive comes to play when aggregate demand is high in relation to the capacity of the economy to produce goods and services (Ahuja, 2013). In the case of expansionary, it is designed to stimulate the growth of aggregate demand through increase in the rate of money supply thereby making credit more available and interest rates lower; eventually promoting employment level in the economy through rise in investment ceteris paribus. On the contrary, if the quantity of money is reduced or restricted, money income will rise slowly so that consumers spend less and funds for investment are difficult to acquire thereby decreasing aggregate investment.

Irrespective of the regulating tools adopted, the goals of monetary policy remains the same and the desire of the policies employed has a way on the economy with its success depending on the operating economic environment, institutional framework adopted and the choice and mix of the tools used. Indirect control is mostly used by market based economies and involves the control of the money stock through the manipulation of the sources of the monetary base by the application of the open market operation (OMO), and reserve requirements among other, so as to impact monetary aggregates used for monetary control (Aladejar, Danjuma and Nyputen, 2017). This has been predominantly operational in Nigeria, since the Structural Adjustment Programme (SAP) era. Prior to SAP in Nigeria, there was the use of direct monetary policy control which rest on establishing limits on interest rates, credit and lending and include direct credit control, direct interest rate control and direct lending to banks. During this era, monetary policy objectives was centred on maintenance of confidence in the naira through measures to stabilise domestic wages and prices, control of inflation, reduction of unemployment rate, promotion of productive capacity, capital formation and Balance of Payment (BOP) stability etc (Anyanwu, 1993). This era, according to Soludo (2008) was a stifled era as nominal interest rate was lowest while inflation was high. Real interest rate was negative which led to low savings, low investment and low economic growth. Monetary policy in Nigeria during

the SAP era (deregulation era) aimed at stimulating output and employment, promote domestic and external stability through market oriented saving and efficient resources allocation (Ajudua *et al*, 2015). Interest rate was targeted as it helps in the mobilisation of financial resources so as to ensure efficiency in resource utilisation in the production process thereby increasing the level of investment which in turn improve employment rate. Monetary policy has a dual mandate of guaranteeing high employment rate and price stability. Overtime, economists have employed monetary policy to achieve almost every conceivable economic objective with economic growth and low level unemployment often high in the list (Essien, *et al.,* 2016).

In Nigeria, unemployment has become a prominent feature of the economy with its associated high poverty level and misery index. As the day goes by, unemployment and its consequences continue to increase. There is a huge churn out of all kinds of graduates into the labour market with little or nothing to engage them in terms of employment. In November 2016, the federal tax agency received 700,000 applications for 500 vacancies while in May 2016, nearly a million people applied for 10,000 employment spaces in the Nigerian Police Force. As at 2017, Nigeria recorded an unemployment rate of about 18.8% (NBS, 2017). A report from the World Poverty Clock in 2018 put Nigeria as the poverty capital of the world, overtaking India as the country with the most extreme poor people in the world. The study further stated that of about 180 million Nigerians, 86.9 million Nigerians now live in extreme poverty representing about 46.7% of its estimated population. This goes to show that the country's full potentials of labour-surplus have not been fully exploited.

Monetary policy and unemployment link in Nigeria depends on the instruments used and the economic condition of a country. A close look at the economic trend shows that with the adoption of the liberalization and deregulation of the economy in 1986 which also encompassed privatization of state enterprises, liberal trade and investment policies, a market determined exchange rate was adopted which led to the depreciation of the naira to the dollar, leading to the inability of many firms to import raw materials required to support their output levels, this was due to fall in the value of the naira and an increase in general price level which subsequently led to a fall in real

wages thereby weakening the purchasing power of people. Consequently, there was a fall in national aggregate demand. In reply to the situation, there was a reduction in the workforce in the manufacturing sector due to retrenchment and no employment into the public sector. Thus, there was a swell in the idle workforce leading to an increase in unemployment in the country.

With Fasanya, Onakoya and Agboluaje (2013) positing that monetary policy innovations have real and nominal effects on economic parameter, this study seeks to investigate the relationship between unemployment and monetary policy in Nigeria.

Theoretical Underpinnings

Monetary theory aims at understanding and explaining the impact of changes in money supply on the price level, real income, output and employment. The Keynesian economics advocates government intervention to help overcome the lack of aggregate demand to reduce unemployment and increase economic growth. The Keynesians posited that unemployment can be reduced through a reduction in interest rates and government investment in infrastructure. According to the Keynesian monetary transmission mechanism, given the assumption that the economy is at less than full employment equilibrium, the built-in-policy transmission mechanism works through the financial system to the real sector via interest rate (Gbosi, 2005). The effect of money supply on economic activity works through interest rate which determines investment in the economy (Ahuja, 2013). Determined by equilibrium between demand for money and supply of money, interest rate effect on money supply provides a mechanism through which changes in money supply affect the goods market which determines level of economic activity. Movements of interest rate result in increase/decrease in money supply which increases/decreases investment leading to an increase/decrease employment via the multiplier.

The classical monetary theory is hinged on Irvin Fisher's quantity theory of money. According to Fisher, he posited that other things remaining unchanged, as the quantity of money in circulation increases, the price level also increases in direct proportion while the value of money decreases and vice versa (Jhingan, 1997). To him, the quantity of money is the main

determinant of the price level. He further assumed that the rise in commodity prices would precede the increase in interest rate which was regarded as the main channel of firms operating costs. The rise in commodity price would lead to an increase in the firm's profits followed by increase in investment leading to a rise in employment (Okonkwo, Egbulonu and Emerenini, 2015).

Empirical Studies

Okonkwo, Egbulonu & Emerenini (2015) examined the impact of monetary policy on manufacturing in Nigeria. They concluded that money supply (MS) and credit to private sector (CPS) exert great pressure on manufacturing.

Analysing monetary transmission in Croatia using the Granger causality test and error correction model, Vizek (2006) revealed that monetary policy affects industrial output through changes in the exchange rate and money supply, while interest rate changes do not have any influence.

Nwosa and Saibu (2012) investigated the transmission mechanism in Nigeria on sectoral output growth in Nigeria for the period 1986 to 2009. Using quarterly data, the study showed that interest rate channel was most effective in transmitting monetary policy to agriculture and manufacturing sectors.

Using simple regression, Olorunfemi and Dotun (2008) investigated the impact of monetary policy on Nigeria's economic performance. They revealed that there exist a negative relationship between interest rate and GDP and inflation and GDP.

Imoughele and Ismaila (2014) examined manufacturing sector output and monetary policy variables in Nigeria and found out that there exist a long run relationship between manufacturing sector output and monetary policy variables in their study indicating a self-adjusting mechanism for correcting any deviation of the variables from equilibrium.

Using panel data analysis, Göçer (2013) examined the relationship between changes in money supply in terms of total lending of the banking sector and unemployment in fourteen selected European from 1980-2012 . His findings showed a reduction in unemployment rate in these countries being attributed to increase in lending.

Damachi (2001) studied past policy measures for solving unemployment problems in Nigeria. He opined that there is a strong need for institutional collaboration and improved coordination of policy measures for dealing with unemployment.

Methodology

This study adopts an ex-post facto research design, since it involves secondary time series data obtained from the CBN Statistical Bulletin for 31 years ranging from 1986 to 2016. Independent variables employed include Interest Rate (INR), Monetary Policy Rate (MPR), Foreign Exchange Rate (FEX), Inflation Rate (INF) and Money Supply (MS). Unemployment Rate (UER) was the dependent variable. The technique of analysis is the ordinary least square due to its BLUE features and the method of analysis is the Error Correction Mechanism (ECM) which correct for all short run errors so as to achieve a better long run relationship while stipulating the duration of adjustment. Pre-estimation tests were carried out to smooth the dataset and have glimpse to the long run relationship among the variables through augmented Dickey Fuller unit root test and Johansen cointegration test respectively. Also, a post-estimation test was carried out to be sure of the correctness of the model estimated. This was done through residual error test and stability test.

Model Specification

The model specification in this study streams from the theoretical underpinnings and is thus presented as follows;

$$Y_t = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \varepsilon_t \quad ---------(1)$$

Equation (1) explains that X_1, X_2, X_3, X_4 and X_5 are the presumed exogenous variables that explain any variation in Y_t. α is the intercept, $\beta_1, \beta_2, \beta_3, \beta_4 \, and \, \beta_5$ are output elasticities with respect to individual input or macroeconomic factor, which are the parameter to be estimated, while, ε_t is the error term of the model.

Equation 1 could be transformed as follows;

$$UER_t = \alpha_0 + \beta_1 INT + \beta_2 MPR + \beta_3 FEX + \beta_4 INF + \beta_5 MS + \varepsilon_t \quad --(2)$$

Equation (2) is the long run model of linear relationship between the dependent variable Unemployment Rate (UER) and other independent variables (Interest Rate, Monetary Policy Rate, Foreign Exchange Rate, Inflation Rate and Money Supply). These variables exhibited the presence of non stationarity properties in their level, this therefore call for a short run model. The choice of Error Correction Model (ECM) is beckoned on the fact that all included variables became linearly integrated at first difference, and they were equally cointegrated, implying that both the long run and short run model are relevant as all short run drift will eventually converge to long run equilibrium.

Apriori expectations include, $\beta_1 < 0, \beta_2 < 0, \beta_3 < 0, \beta_4 < 0, \beta_5 > 0$

Analysis and Presentation of Result

Descriptive Analysis of the Model

Table 1: Descriptive Analysis of variables employed

	UER	INT	MPR	FEX	INF	LnMS
Mean	12.72581	18.82839	13.61097	88.79971	19.63935	7.600395
Median	12.20000	17.98000	13.50000	111.9433	12.90000	7.600402
Maximum	28.50000	29.80000	26.00000	253.4900	72.80000	7.606885
Minimum	1.800000	10.50000	6.130000	2.020600	5.400000	7.593878
Std. Dev.	9.282563	3.833177	3.882549	70.24839	17.54331	0.003971
Skewness	0.400130	0.907165	0.851709	0.208855	1.677795	-0.004597
Kurtosis	1.829662	4.450254	4.866329	1.996112	4.730203	1.796759
Jarque-Bera	2.596391	6.968578	8.247054	1.527104	18.41088	1.628857
Probability	0.273024	0.030676	0.016187	0.466008	0.000100	0.442892
Sum	394.5000	583.6800	421.9400	2752.791	608.8200	205.2107
Sum Sq. Dev.	2584.979	440.7974	452.2257	148045.1	9233.034	0.000410
Observations	31	31	31	31	31	31

Source: Authors' Computation from output, 2018

The descriptive analysis of the variables employed in the model shows that during the period of study, inflation level averaged 20%, interest rate is 19%, and exchange rate is N88.80K per dollar. Also, unemployment rate was 12.72% reaching a maximum of 28.5%. Interest rate averaged 18.8%.

Unit Root Test

Table 2: Summary of Unit Root Test Results Using Augmented Dickey Fuller (ADF)

Variables	5% Critical Value	ADF Test Statistic at Level (I(0))	ADF Test Statistic at 1st Differencing (I(1))	Prob at 1st Differencing	Status I(d)
UER	-2.967767	-0.279133	-6.805769	0.0000	I(1)
INT	-2.991878	-2.507037	-4.860252	0.0007	I(1)
MPR	-3.004861	-2.960547	-4.689564	0.0013	I(1)
FEX	-2.967767	-0.884902	-3.462390	0.0167	I(1)
INF	-2.986225	-2.056053	-3.430434	0.0194	I(1)
LnMS	-2.891322	-2.154328	-3.332155	0.0026	I(1)

Source: Author's computation from output

The table above shows the stationarity tests of the variables employed. Variables became stationary at the point where the value of ADF test statistic is greater than the critical value at 5%. At level, variables employed were not stationary. They became stationary after first difference implying that all variables in the model are integrated of order 1, denoted by I(1). The study further carried out a co-integration test, using the Johansen cointegration technique.

Cointegration Analysis

Sample (adjusted): 1988 2016
Included observations: 29 after adjustments
Trend assumption: Linear deterministic trend
Series: UER INT MPR FEX INF

Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.749404	73.49423	69.81889	0.0247
At most 1*	0.639015	53.36078	47.85613	0.0369
At most 2	0.334206	19.01869	29.79707	0.4916
At most 3	0.174519	7.222195	15.49471	0.5520
At most 4	0.055644	1.660306	3.841466	0.1976
At most 5	0.043124	1.194122	2.4871231	0.1833

Trace test indicates 2 cointegrating eqn(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 No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.749404	40.13345	33.87687	0.0079
At most 1*	0.390158	34.34209	27.58434	0.0483
At most 2	0.334206	11.79649	21.13162	0.5679
At most 3	0.174519	5.561889	14.26460	0.6698
At most 4	0.055644	1.660306	3.841466	0.1976
At most 5	0.052341	1.544901	2.991281	0.1772

Max-eigenvalue test indicates 2 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

As shown above, the trace statistic indicated 2 cointegrated equations at 5% critical value. Thus, the null hypothesis of no cointegration is rejected. Similarly, the maximum eigenvalue indicated two (2) cointegrating equation at 5% level with Max-eigen statistic. Therefore, the null hypothesis of no

cointegration is rejected. Both results imply the existence of long-run relationship among the variables in the model. Nevertheless, since the variables in the model are all integrated at order one (I(1)), then the error correction mechanism (ECM) is a possibility and it equally indicates that the long run static OLS is not spurious and meaningful since the short run dynamic model will at the end adjust to long run equilibrium after overcoming the short run drift.

Error Correction Model

Dependent Variable: D(UER)
Method: Least Squares
Sample (adjusted): 1986 2016
Included observations: 31 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.223624	0.021265	3.211243	0.0176
D(INT)	-0.040987	0.024314	-1.911121	0.1426
D(INT(-1))	-0.074382	0.029225	-2.035139	0.0521
D(INT(-2))	-0.046386	0.031399	-1.425421	0.1765
D(MPR)	-0.054390	0.030124	-2.997765	0.0445
D(MPR(-1))	-0.048634	0.028684	-2.832048	0.0499
D(MPR(-2))	-0.065683	0.027623	-2.377814	0.0549
D(FEX)	-0.000358	0.000274	-1.306036	0.2394
D(FEX(-1))	-0.000422	0.000277	-1.523630	0.1784
D(FEX(-2))	-0.036473	0.020646	-1.766592	0.1277
D(INF)	-0.000393	0.000225	-3.746551	0.0313
D(INF(-1))	-0.000656	0.000333	-2.966441	0.0462
D(INF(-2))	-0.000701	0.000331	-2.118909	0.0784
D(LNMS)	3.427710	0.597164	3.543229	0.0317
D(LNMS(-1))	2.102598	0.562987	3.734716	0.0022
D(LNMS(-2))	-0.299229	0.368303	-0.812453	0.4301
ECM(-1)	-0.320016	0.030586	-2.993214	0.0354

R-squared	0.739340	Mean dependent var	0.020821
Adjusted R-squared	0.665431	S.D. dependent var	0.011953

S.E. of regression	0.009804	Akaike info criterion	-8.384667
Sum squared resid	0.000577	Schwarz criterion	-7.547389
Log likelihood	89.19190	Hannan-Quinn criter.	-6.066480
F-statistic	7.894534	Durbin-Watson stat	1.965433
Prob(F-statistic)	0.035214		

The parsimonious error correction mechanism in the table above revealed that monetary policy rate (MPR) money supply (LNMS) and inflation rate (INF) at either current or lagged values appeared with expected sign and significantly influenced unemployment rate Nigeria at 5% critical level. Interest rate and Foreign Exchange Rate appeared with expected sign but were not significant. The R squared of 0.739 revealed that about 74 percent changes in unemployment rate in Nigeria is explained by the independent variables in the model, with no indication of serial auto correction seen as suggests by DW of 1.96. The error correction coefficient was rightly signed and significant at 5 percent with 32 percent disequilibrium in unemployment rate is corrected for in the long run.

Causality Test

Pairwise Granger Causality Tests
Sample: 1986 2016
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
INT does not Granger Cause UER	29	2.25742	0.1264
UER does not Granger Cause INT		1.87172	0.1756
MPR does not Granger Cause UER	29	1.24878	0.3048
UER does not Granger Cause MPR		2.26791	0.1253
FEX does not Granger Cause UER	29	0.84970	0.4400
UER does not Granger Cause FEX		1.25475	0.3032
INF does not Granger Cause UER	29	0.49981	0.6128
UER does not Granger Cause INF		2.03488	0.1526

LNMS does not Granger Cause UER	29	4.59572	0.0204
UER does not Granger Cause LNMS		0.79885	0.4614
MPR does not Granger Cause INT	29	0.87473	0.4299
INT does not Granger Cause MPR		3.12567	0.0622
FEX does not Granger Cause INT	29	2.48708	0.1043
INT does not Granger Cause FEX		1.07827	0.3561
INF does not Granger Cause INT	29	3.12803	0.0621
INT does not Granger Cause INF		0.90290	0.4187
LNMS does not Granger Cause INT	29	3.84884	0.0355
INT does not Granger Cause LNMS		0.12333	0.8845
FEX does not Granger Cause MPR	29	2.20578	0.1320
MPR does not Granger Cause FEX		0.09549	0.9093
INF does not Granger Cause MPR	29	2.28275	0.1237
MPR does not Granger Cause INF		5.18808	0.0134
LNMS does not Granger Cause MPR	29	3.25185	0.0563
MPR does not Granger Cause LNMS		0.42494	0.6586
INF does not Granger Cause FEX	29	0.90546	0.4177
FEX does not Granger Cause INF		2.30159	0.1218
LNMS does not Granger Cause FEX	29	3.96515	0.0325
FEX does not Granger Cause LNMS		0.16289	0.8506
LNMS does not Granger Cause INF	29	2.69232	0.0881
INF does not Granger Cause LNMS		0.04627	0.9549

The causality test shows no bidirectional causality. However unidirectional causality was seen running from LNMS to UER, LNMS to INT, MPR to INF and LNMS to FEX.

Test of Stability

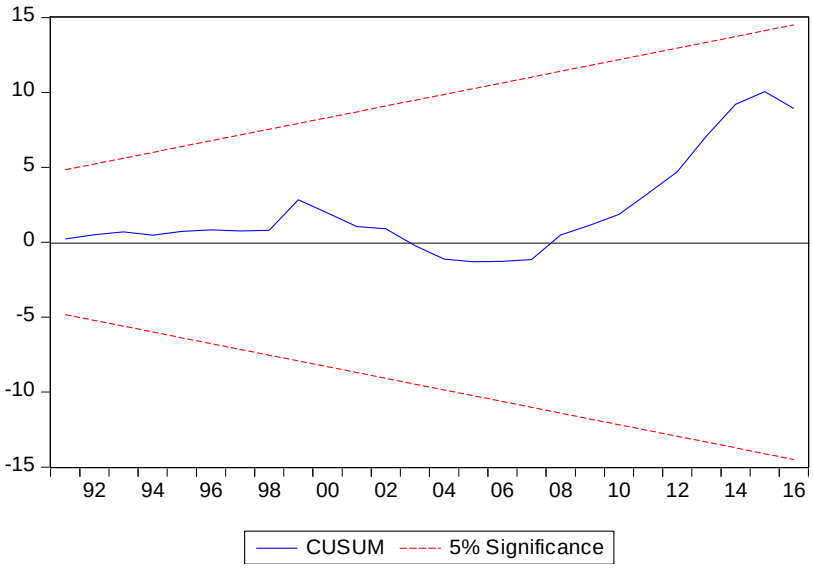


Figure 1: CUSUM Stability Test Result

The stability test enables us to predict the dependent variables in a regression with a reasonable level of precision given the independent variables used in the analysis. The stability test conducted showed that the CUSUM stability test corroborate the stability view with the plot falling within the 5 percent critical acceptance lines, one can generally conclude that the estimated parameters for the study are stable and are useful for policy decision.

Conclusion and Recommendations.

This study examines monetary policy and unemployment linkage in Nigeria using the OLS regression method. The analysis was done with unemployment rate as the dependent variable, and money supply, interest rate, foreign exchange rate, inflation rate and monetary policy rate all independent variables. Findings in the study revealed that money supply, inflation rate and monetary policy rate all exact pressure on unemployment in Nigeria.

Based on findings, the following recommendations are made;

- The monetary authorities should ensure that the monetary policy rate which is a control rate for all other monetary variables shouldn't be high. This will in turn affect the lending rate thereby discouraging investors from borrow to expand investment necessary for employment generation.

- There is a need for stable price level and foreign exchange rate. This is required for steady and continuous growth in investment necessary for the creation of jobs.

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