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Empirical Analysis of Monetary Policy & Unemployment in Nigeria: An Econometric Approach

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ABSTRACT: The study empirically investigated the relationship between monetary policy and unemployment in Nigeria. After critical review of theoretical and empirical literature, a model was constructed with unemployment as the dependent variable while interest rate and money supply were the independent or explanatory variables. Data used for the study were sourced from the Central Bank of Nigeria. The Augmented Dickey Fuller, Johansen co-integration, and fuller modified ordinary least square methods were used to analyze the data. Findings from the study show that interest rates have a negative and statistically insignificant relationship with interest rates. On the other hand, the money supply has a positive and statistically significant relationship with unemployment. Based on the findings, monetary policy tool is a veritable instrument to achieve the macroeconomic objective of addressing the challenge of unemployment in the country.

KEYWORDS: Money Supply, Unemployment, Interest Rate, Monetary Polic.

1.0 INTRODUCTION

One of the measures of the economic well-being of a country is the rate or level of unemployment. This is because the quality and quantity of goods and services people can access, which ultimately defines their standard of living is dependent on their level of income. However, people can only earn income if they are gainfully employed. Thus, in line with the above reasoning, high rate of unemployment is synonymous with low standard of living and poverty as individuals will be unable to afford necessities of life which consequently leads to all manner of social and economic vices. It is in the light of the obvious costs of pervasive unemployment to society that has caught the attention of economists, policy makers, and the government.

The rate of unemployment in Nigeria increased to 37.7% in 2022 and is likely to increase further to 40.6% in 2023 due to an increase in the number of labour forces in the labour market (KPMG Global Economy Output, 2023). The slow growth of gross domestic product and the inability of the labour market to absorb the 4-3 million new job seekers entering the labour market annually have further aggravated the unemployment rate in the country.

The social and economic consequences of the high rate of unemployment cannot be overemphasized. High rates of unemployment lead to loss of aggregate income, dampening in self-confidence of the unemployed, and a spike in social vices (Clever, 2007; Bredino & Fiderikumo, 2018). Rising Unemployment is indicative that there are idle resources yet to be maximized by the economy. As a result, there is a loss in the additional income that these unemployed people could have produced if gaining employment. In addition, the army of unemployed people are potential triggers of social vices (except in developed countries where the unemployed are paid stipends by the government). Thus, Dogrul and Soytas (2010) asserted that unemployment has serious negative social- economic consequences on the economy; hence, it is imperative for policy makers to not only identify its determinants, but to formulate policies to ameliorate its effects.

It is in the light of this that the attainment of an acceptable rate of unemployment has been the key concern of economies the world over. Thus, it is on the backdrop of the aforementioned that this paper aims to empirically ascertain whether or not the Central Bank of Nigeria' monetary policy stance has been consistent in terms of achieving the macroeconomic objective of reducing the rate of unemployment in the country.

2.0 REVIEW OF LITERATURE

2.1 Theoretical Review

The classical theory of unemployment is one of the oldest theories of unemployment. Traditionally, the classical economists are known for their liberalist approach or methods in addressing economic issues. According to them, markets will function better if unimpeded by government law and regulations. In other words, the government should hands-off their grip on the economy and allow the market forces of demand and supply to determine the optimum level of economic activities. The automatic alignment of the market forces of demand and supply that tends to lead to equilibrium in a capitalist economy is the main thrust of the classical economist. In the view of Neva et al. (2006), the classical stance on unemployment is predicated on the tenets of a single market economy characterized by perfect competition, spot transactions, and institutions for double-auctioning bid. According to them, involuntary unemployment exists when market forces (demand and supply) are deliberately interrupted.

In line with the postulates of the classical economists, the market forces of demand and supply automatically adjust themselves to ensure that the economy is at equilibrium. Thus, the economy is always at full employment at any given point in time. In their view, the existence of unemployment in an economy is an anomaly which will automatically disappear on its own by the workings of the market mechanism (Jhingan, 2008).

Before the advent of the Keynesian school of economic thought, the theories of the classical economist held sway till midway through the 18th Century. However, the economic hardship that struck the world in the great depression of the 1930's with its attendant debilitating consequences shook the foundations of classical beliefs which at the time were impotent in restoring economic sanity. It was the fallout of the scenario and the search for a more coherent and effective solution to the economic ills at the time that heralded the advent of a new economic ideological leaning called the Keynesian school of economic thought.

To Keynesians prices are sticky downwards; meaning that, once there is an increase in prices it is very difficult for them to come down. In addition, they posited that it is difficult to find an economy that is perfectly competitive given that monopolies and unions tend to be permanent fixtures in our economy, and the prices they create tend to be inflexible, at least downwardly (Keynes, 1936).

The crust of the Keynesian school is the emphasis of effective aggregate demand as a tool to achieve specified macroeconomic objectives. They propose the adoption of an interventionist approach, by stressing the need for government involvement in the economy. By government involvement, we mean, the use of taxation and public expenditure to regulate aggregate expenditure.

Note, however, that at every point in time governments are either struggling to accommodate unemployment or inflation but not both. For instance, any equilibrium point beyond ADF, will result in inflation, while at any point below AD_f will bring about unemployment. In the words of Gotheil (1999)," It never occurred to Keynesians that they would ever have to choose between policies to control unemployment and policies to control inflation".

The factor price theory of unemployment is a variant of the classical theory of unemployment. Like classical theory, it is predicated on the tenets that the workings of the market mechanism are the key determinant of the level of unemployment. However, the theory posits that in the case of Less Developed Countries (LDC), the high rate of unemployment is as a result of the distorted prices of factors of production such as; labour and capital (Kalu, 2001). Specifically, the price of labour is more than proportionate to its shadow value i.e. the market determined price based on the interplay of demand and supply, while the price of capital is more than proportionate to its shadow value (Robert, 1980).

2.2 Empirical Review

In this section we shall briefly review relevant empirical literature on the subject matter with the aim of identifying literature gaps. Chukwuma, N. (2022), carried a study titled "Monetary Policy and Unemployment in Nigeria: An Empirical Investigation". As the title of the paper suggests, the study was aimed at empirically investigating the impact of monetary policy on the rate of unemployment in Nigeria. The variables used for the study include unemployment rate, prime interest rate, minimum reserve requirement, and exchange rate. The time series data were sourced from the Central Bank of Nigeria and National Bureau of Statistics. The Autoregressive Distributed Lag and the Error Correction Models were used in analyzing the data. Findings from the study show that in the long there is positive and significant relationship between prime lending rate and unemployment in Nigeria, and a negative and significant relationship between minimum rediscount rate and unemployment. Also, there is positive and insignificant relationship between exchange rate and unemployment in Nigeria. Based on the findings he recommended that CBN should reduce the minimum rediscount rate so as to encourage investment and thus, reduce the rate of unemployment in the country.

Sunday et al., (2016) this paper examined the link between monetary policy and unemployment in Nigeria. Specifically, they attempted to ascertain the effects of structural changes or shocks on the identified VAR model used. Times series data on unemployment rate, monetary policy rate, money supply rate, and growth of gross fixed capital formation (a proxy for investment) were used for the study. The above data were sourced from the Central Bank of Nigeria and National Bureau of Statistics. The Augmented Dickey Fuller and Philip Peron statistics as well as the Vector Error Correction Model were used in analyzing the data. Findings from the study show that the unemployment rate is raised whenever there is a positive shock to policy rates. Also, the monetary policy rate, money supply, and investment granger cause unemployment rate. They concluded that there is a dynamic relationship between monetary policy and unemployment in Nigeria.

Onwuka, C. E. (2021) studied the impact of fiscal and monetary policy on unemployment rate in Nigeria. The data used for the study were sourced from the Central Bank of Nigeria and the National Bureau of Statistics. Specifically, the variables used for the study include unemployment rate, government expenditure and taxation, money supply and interest rate. The data spans the period 1981 -2020. The Augmented Dickey Fuller (ADF) unit root and Johansen Co-integration tests were used tests for unit root and long-root association of equations respectively. Also, the Vector Autoregressive (VAR) model was used to test the inter-relationships between the variables in the model. Findings from the study show that there exist a negative and significant relationship between interest rate and government expenditure on the unemployment rate in Nigeria. There was a negative and insignificant relationship between government taxation and the rate of unemployment. On the other hand, the money supply has a positive and significant relationship with unemployment at lag 1. The study concluded that money supply, government expenditure, and interest rate are major determinants of unemployment in Nigeria.

3. STUDY METHOD

3.1 Data Collection & Sources

The variables used for this study include unemployment rate, money supply, and interest rate. The data were sources from the Central Bank of Nigeria. The time series data covers the period 1981- 2021.

3.2 Research Design & Data Analysis Technique

The ex-post research design will be adopted for this study. The choice of this method is predicated on the type of data used for the study (secondary data). The ordinary least square method will be used for this study, however, a pre-data analysis will be conducted on the dataset to ascertain their innate characteristics and guide our choice of statistical tool to further introduce in our analysis.

Unit Root Test

Owing to the characteristic nature of time series data and its implication on the regression result if not checked, the Augmented Dickey Fuller unit root tests were employed to test whether the data are stationary. The null hypothesis (non-stationarity) was tested against the alternative hypothesis of no unit root (stationarity).

Mathematically, the unit root equation can be expressed thus.

$$\Delta(Y_t = m_0 + m_1(X_{t-1}) + \sum_{i=1}^{q} \beta_1 \Delta(x_{t-1}) + E_t$$

Where: Y = variable being tested for unit, $m_1$and $\beta_{1=}$ parameter estimates, q = maximum order of lag, Δ = notation for first difference, E_t= Error term.

Co-integration Test

Co-integration is conducted based on the test proposed by Johansen. According to Iyoha and Ekanem, (2002) co-integration deals with the methodology of modeling non-stationary time series variables. The algebraic specification of the model is thus.

$$J_{trace}(r) = -N \sum_{i=r+1}^{n} \text{Log}(1 - \lambda_i)$$

$$J_{max}(r, r+1) = -N \text{ Log} \sum_{i=r+1}^{n} \text{Log}(1 - \lambda r + 1)$$

Where$F_{trace}(r)$ and $F_{max}(r, r+1)$ denotes trace and max Eigen statistics respectively.

λ =coefficient of characteristics root, N=Sample Size, r=cointegrating vectors

n = lag length and log = notation of logarithm transformation

3.3 Data & Model Specification

The specified model of the study is stated below

Unemp = f(Ir, Ms) ……..……. (3.1)

Where,

Unemp = Unemployment Rate

Ir = Interest rate

Ms = Money Supply

The econometric model of equation (3.1) above is postulated as the following linear specification.

$Unemp = \alpha_0 + \alpha_1 Ir + \alpha_2 Ms + U$…… (3.2)

Where; Unemp, Int, and Ms are described in equation above (3.1)

α_0 = Constant regression estimate, $\alpha_1 - \alpha_2$ = slope regression estimates and U = random error term.

4. RESULTS & DISCUSSION

The results of the various statistical analysis stated in the previous section are shown and explained in details in the following sections.

Unit Root Test:

The output of the Augmented Dickey fuller Unit root test is shown below

Table 4.0: Augmented Dickey Fuller Unit Root Test

VARIABLES	LEVELS		1st DIFFERENCE		Order of Integration
	ADF Test Statistics	Test Critical Value @ 5%	ADF Test Statistics	Test Critical Value @ 5%	
UNE	-3.725447	**-3.533083	-5.284075	**-3.529758	I(1)
Ir	-3.250462	-3.526609	-7.11823	**-3.529758	I(1)
Ms	3.318253	**-1.949609	3.26848	**-1.949856	I(0)

Source: **Authors Computation Using E-view**

As shown in table 4.0 above, the unemployment rate (UNE) and money supply (Ms) are stationary at level and first difference, while interest rate (Ir) is stationary at first difference.

Co-integration Test:

To ascertain the nature of long-run relationship among variables in the model the Johansen co-integration test was conducted. The output of the Johansen test is shown in table 4.1 below

Table 4.1: Johansen Co-integration Test

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	Prob.**	Max-Eigen Statistic	Prob.**
None *	0.406354	40.12857	0.002	20.33741	0.0643
At most 1 *	0.314527	19.79116	0.0106	14.72818	0.0422
At most 2	0.121746	5.062975	0.0244	5.062975	0.0244

Source: **Authors Computation Using E-view**

The output of the Johansen co-integration analysis shows that there exist 2 co-integrating equation in the model. Both the trace and max-eigen statistics show that there is long run relationship among the variables in the model.

Fully Modified Ordinary Least Square (FMOLS):

Table 4.2: Fully Modified Ordinary Least Square

Variable	Coefficient	Std. Error	t-Statistic	Prob.
IR	-0.305237	0.219195	-1.392539	0.1721
MS	0.000507	0.000102	4.947508	0.0000
C	11.97349	3.163558	3.784818	0.0005
R-squared	0.672326	Mean dependent var		12.125
Adjusted R-squared	0.654614	S.D. dependent var		7.501478
S.E. of regression	4.408585	Sum squared resid		719.118
Long-run variance	44.13921			

Source: **Authors Computation Using E-view**

The output of the fully modified ordinary least square model is shown in table 4.2. From the above output, the coefficient of interest rate (-0.30) and its associated probability of (0.1721) show that interest rate has negative and statistically insignificant relation with unemployment rate in Nigeria. The above outcome is in consonance with apriori expectation because investment expenditure is hinged on interest rate oscillation. The above finding aligns with (Bredino et al., 2023). On the other hand, there is a positive and significant relationship between money supply and unemployment rate in the country.

5. SUMMARY AND CONCLUSION

The sporadic rise in the rate of unemployment and inflation in the country with its attendant adverse effects on the standard of living calls for serious attention. It is based on this that this paper aims to empirically investigate the relationship between unemployment and monetary policy in the country.

After critical review of theoretical and empirical literature, a model was constructed with unemployment as the dependent variable while interest rate and money supply are the independent or explanatory variables. Data used for the study were sourced from the Central Bank of Nigeria. The Augmented Dickey Fuller, Johansen co-integration, and fuller modified ordinary least square methods were used to analyze the data. Findings from the study show that interest rates have a negative and statistically insignificant relationship with interest rates. On the other hand, the money supply positive and statistically significant relationship with unemployment. Based on the findings from the study, monetary policy tools are veritable instruments to achieve the macroeconomic objective of reducing the rate of unemployment.

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