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Monetary policy and unemployment rate in Nigeria: An empirical investigation

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Abstract

The study investigated the impact of monetary policy on unemployment rate in Nigeria. Time series data spanning from 1981 to 2020 was sourced from the Central Bank of Nigeria statistical bulletin and national bureau of statistics (various editions). The ARDL bounds testing approach to co-integration was used to analyse the data. Autoregressive Distributed Lag (ARDL) model and Error Correction Model (ECM) were utilized to address the main objectives of the study. The estimated short run coefficient result revealed that prime lending rate has a positive and insignificant impact on unemployment rate while that minimum rediscount rate has a negative and insignificant impact on unemployment rate. The speed of adjustment for correcting disequilibrium from the previous year to equilibrium in current year is 81.9 percent as shown by the coefficient of ECM. The long run result of the study showed that there is a positive and significant impact between prime lending rate and unemployment rate in Nigeria but a negative and significant impact between minimum rediscount rate and unemployment rate in Nigeria. The run result equally revealed that there is a positive and insignificant impact between exchange rate and unemployment rate in Nigeria. Based on these findings, the study recommended that the monetary authority should come up with policies that will reduce minimum rediscount rate as this will encourage borrowing of funds for investment purposes as this will help to reduce unemployment rate. Monetary authorities should also come up with policies that will stabilize exchange rate.

Keywords: Unemployment rate; Minimum rediscount rate; Prime lending rate; Exchange rate

1. Introduction

Unemployment is among the most difficult and politically sensitive economic issues that policy makers face. High rates of unemployment generates intense public concern because its effect is direct and visible [1] Unemployment of labour is seen as a situation when there are people who are capable of working and also qualified by age, custom, law and other factors to work but cannot find jobs [8]. [7] opined that one is unemployed only when one is willing and able to work but cannot find a job while [16] argued that unemployment arises when people within the age of the working population, who are able, willing and seek for jobs without finding any at the prevailing wage rate. [2] defined unemployment as a state of affairs when is a country there are a large number of able-bodied persons of working age who are willing to work but cannot find work at the current wage levels. People who are either unfit for work for physical or mental reasons or do not want to work are excluded from the category of unemployed. One is counted as unemployed only if he or she is willing and able to work but cannot find a job.

1.1. Statement of problem

Unemployment rate in Nigeria has been increasing over the time despite different types of monetary policies that have adopted to achieve full employment. For instance in 1981, unemployment rate was 6.4 percent but in 2006 it rose to 12.3 percent while in 2016 and has also continued to rise till 2020 when it stood at 33.3 percent. The effect of this

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continued increase in unemployment has been so disastrous Given that achievement of full employment is among the objectives of monetary policy; the study therefore investigated the impact of monetary policy on unemployment rate in Nigeria.

Objectives of the study

The broad objective of the study was to investigate the impact of monetary policy on unemployment rate in Nigeria. The specific objectives of the study were:

- To examine the impact of prime rate on unemployment rate in Nigeria.
- To investigate the impact of minimum rediscount rate on unemployment rate in Nigeria.
- To examine the impact of exchange rate on unemployment rate in Nigeria.

1.2. Hypothesis of the study

In order to guide the study, the following null hypotheses were formulated:

- HO1: Prime rate does not have any impact on unemployment rate in Nigeria.
- HO2: Minimum rediscount rate does not have any impact on unemployment rate in Nigeria.
- HO3: Exchange rate does not have any impact on unemployment rate in Nigeria.

2. Literature review

2.1. Theoretical Framework

2.1.1. Classical view of monetary policy

Money according to the classicists is a veil. It is neutral in its effects on the economy. It simply affects the price level, but nothing else. An increase in the money supply leads to an increase in the price level, but the real income, the rate of interest and the level of real economic activity remain unaffected. In the classical system, the main function of money is to act as a medium of exchange. It is to determine the general level of prices at which goods and services will be exchanged. This relationship between money and the price level is explained in terms of the quantity theory of money. The classical quantity theory of money states that the price level is a function of the money supply. Algebraically, $MV = PT$ where, M, V, P and T are the supply of money, velocity of money, price level and the volume of transactions (or real total output). The equation tells that the total money supply (MV) equals the total value of output (PT) in the economy. Assuming V (the velocity of money) and T (the total output) to be constant, a change in the supply of money (M) causes a proportional change in the price level (P) [12].

2.1.2. The Keynesian view of monetary policy

In the Keynesian analysis, monetary policy plays a crucial role in affecting economic activity. It contends that a change in the supply of money can permanently change such variables as the rate of interest, the aggregate demand and the level of employment, output and income. Keynes believed in the existence of unemployment equilibrium. This implies that an increase in money supply can bring about permanent increases in the level of output. The ultimate influence of money supply on the price level depends upon its influence on aggregate demand and the elasticity of the supply of aggregate output. In a situation of unemployment, Keynes advocated cheap money policy. When the supply of money is increased, its first effect is on the rate of interest which tends to fall. Given the marginal efficiency of capital, a fall in the rate of interest will increase investment. The increased investment will raise effective demand through the multiplier effect thereby raising income, output and employment [12].

2.1.3. The Modern view of monetary policy

The modern monetary economists reject the Keynesian view that the link between the supply of money and output is the rate of interest. The Keynesian analysis considered only two types of assets: bonds and speculative cash balances, and their allocation depended on the rate of interest which in turn, in turn resulted in changes in output. The modern monetary policy is based on the portfolio adjustment process. When the central bank purchases securities in the open market, it sets in motion substitution and wealth effects, as the public portfolio consists of a wide variety of assets such as bonds, equities, mortgages. These effects will ultimately increase aggregate money demand and expand output [12].

2.2. Conceptual literature

[12]. defined monetary policy as any conscious action undertaken by the monetary authorities to change the volume, quantity availability, cost and direction of money and credit in a given economy while [2]. sees monetary policy is concerned with the measures taken to regulate the supply of money, the cost and availability of credit in the economy. [4] opined that monetary policy is a deliberate effort by the monetary authorities (the central bank) to control the money supply and credit conditions for the purpose of achieving certain broad economic objectives. [12] defined monetary policy as the use of money supply to achieve full employment and other economic goals.

The goals of monetary policy according to [16] include full employment, price stability, economic growth and development, and equitable distribution of income while [4]. argued that objectives of monetary policy refer to the macro-economic goals which can change from time to time depending on the economic fortunes of a particular country. Generally, such objectives include maintenance of relative stability in domestic prices, attainment of a high rate of, or full employment, achievement of as high rapid and sustainable economic growth, maintenance of balance of payments equilibrium and exchange rate stability.

According to [19] Central Bank of Nigeria uses various instruments to achieve the objectives of monetary policy. These instruments include: open market operation, required reserve ratio, bank rate, liquidity ratio, selected credit control and moral suasion. [8] opined that there are two types of monetary policy and they are expansionary monetary policy and contractionary monetary policy. Expansionary monetary policy is traditionally used to try to control unemployment when there is a recession by reducing interest rates, increasing the money supply in the economy more rapidly than usual in other to stimulate economic activity. In the case of depression, the central bank buys bonds in the open market, lowers the reserve requirements of commercial banks, reduce the discount rate as well as encouraging public borrowing through selective credit measures. All these will lead to a decrease in the cost and availability of credit in the money market and an improvement in the economy

[7].opined that one is unemployed only when one is willing and able to work but cannot find a job. In the words of [14]. unemployment is defined as the total number of adults who are willing and able to work but have not found a job. [13]. is of the opinion that unemployment rate can be measured as the percentage of the labour force that is unemployed while [10]. opined unemployment rate as the number of jobless individuals who are actively looking for work (or are on temporary layoff) divided by the total of those employed and unemployed. Hyman (2010) agreed that unemployment rate measures the ratio of the number of people classified as unemployed to the total labour force. [18] sees unemployment rate as the proportion of the labour force that is unemployed.

2.3. Empirical literature

[5] investigated the influence of monetary policy as a veritable tool for tackling the problem of unemployment in Nigeria. The study used time series data ranging from 1981 to 2017. The ordinary least squares (OLS) method was used in the analysis. The Augmented Dickey-Fuller (ADF) unit root test was employed in testing the stationarity property of the series and revealed that all the variables were stationary at first difference. This therefore necessitated the test for cointegration using the Johansen cointegration test of which both the Trace statistic and Max-Eigen statistic showed 2 and 1 cointegrating equation(s) respectively. This justified the use of the Error Correction Mechanism (ECM) in the study. Findings of study showed that monetary policy rate (MPR), money supply (MS), Gross Domestic Product (GDP), and Credit to private sector (CPS) had an inverse and significant influence on unemployment in Nigeria within the study period. Also, the existence of cointegrating equations showed that there is a long run relationship between unemployment and the explanatory variables used in this study. The study recommended that emphasis should be laid on aggressively pursuing entrepreneurial development and increased productivity by focusing on investment, employment generation and economic growth that has mechanism to trickle down to the masses.

[3] investigated the efficacy of monetary policy variables in reducing unemployment rate in Nigeria using data spanning from 1970-2013. The study utilized multiple regressions (OLS) approach. Error correction modeling was used to examine the effect of some key monetary policy variables on unemployment in Nigeria. Evidence from the result showed that exchange rate and consumer's price index are the only monetary policy variables that influence unemployment rate while others do not. The results equally x-rayed that there is a unidirectional causality between monetary policy variable and unemployment rate which runs from exchange rate to unemployment. The study recommended that monetary authorities via central bank of Nigeria should ensure some reasonable monetary policy stands that would be suitable in reducing interest rate in the economy. Furthermore monetary authorities should ensure relatively stable

prices of goods and services which would guarantee sustainable investment that can enhance employment opportunities in the country.

[9] investigated the relationship between monetary policy variables (Treasury bill rate, money supply, monetary policy rate, exchange rate) and unemployment using the regression method of analysis. The unit root (Augmented Dickey Fuller) test was used to determine the stationarity of the variables. From the co-integration analysis and the error correction model (ECM), the study found that Treasury bill rate and money supply have positive relationship with unemployment in Nigeria, that there is a negative relationship between monetary policy rate and exchange rate with unemployment in Nigeria. The study concluded that there is a significant negative impact of monetary policies on Nigeria's unemployment, which if not checked will continue to hinder the success of the fight against poverty in the nation. The study recommended among others that the regulating bodies should employ all standard methods of checking inflation by targeting equilibrium between money supply, Treasury bill rate and exchange rate, and maintaining same.

[17] empirically examined the impact of fiscal and monetary policy on unemployment rate using data between the periods 1981 to 2020 by the use of Vector Autoregressive (VAR) model as the major statistical technique of analysis. The data used for the study were annual time series secondary data sourced from Central Bank of Nigeria Statistical Bulletin (CBN) and National Bureau of Statistics (NBS). From the findings, the coefficient of determination (R^2) was 0.652 which shows that about 65 percent variations in the unemployment rate were explained by the independent variables. Also, its adjusted counterpart is 0.602 and its shows that about 60 percent growth in unemployment rate can be explained by the independent variables. The unit root test results indicated that all the variables were stationary at first difference and co-integration test confirmed a long run relationship among the variables. The F-stat value of 4.445 confirms that the overall test is significant. The AR root test confirmed that the estimated model is stable. Also, the serial correlation LM test and heteroskedacity test confirmed that there is no autocorrelation and heteroskedacity in the model. The findings of the study showed that government expenditure and interest rate have negative and significant effect on unemployment rate at lag period 2. Government tax was found to be negative and insignificant at lag period 2. Money supply was found to have a positive and significant at lag period 1. By implication, the findings of the study showed that government expenditure, money supply and interest rate are major determinants of unemployment rate in Nigeria since they were found to be statistically significant. Also, the impulse response function of unemployment showed that unemployment rate that has a negative relationship with its past values from periods except in the first, 2nd, 3rd, 4th and 5th periods. Furthermore, from the forecast error variance decomposition (FEVD) the highest innovation was due to government tax and money supply, while the shock of government expenditure and interest rate in Nigeria were the lowest over the periods. The study concluded that there is need for diverse strategies that will be targeted towards employment creation in Nigeria. Thus, an expansionary fiscal and monetary policy should be encouraged to support employment generation in the country.

3. Methodology

Multiple regression analysis was used in the study. Time series data spanning from 1981 to 2020 was sourced from the Central Bank of Nigeria statistical bulletin and national bureau of statistics (various editions). The data were analysed using E-views 10

3.1. Model specification

In order to investigate the impact of monetary policy on unemployment rate in Nigeria, the model for this study was specified thus;

$$UNEMP = f(PRIME, MRR, EXR) ..... (1)$$

Where;
UNEMP = Unemployment rate
PRIME = Prime rate
MRR = Minimum rediscount rate
EXR = Exchange rate

The model in its econometric linear form can be written as:

$$UNEMP = b_0 + b_1 PRIME + b_2 MRR + b_3 EXR + U ...... (2)$$

Where;

U = stochastic or random error term

bo = constant intercept

$b_1 - b_3$ = coefficients of associated variables

The theoretical expectations about the signs of the coefficients of the parameters are as follows: $b_1 > 0$, $b_2 < 0$, $b_3 > 0$

Since the data for the analysis is time series, the Augmented Dickey-Fuller (ADF) unit root test was employed to ensure data stationarity and avoid the problem of spurious regression.. Bound test was applied to determine the existence of long run equilibrium relationship among the variables

Table 1 Result of Augmented Dickey-Fuller unit root test

Variable	ADF test statistic	5% critical value	Order of integration
UNEMP	-6.453936	-2.941145	1(1)
PRIME	-5.908410	-2.943427	1(1)
MRR	-3.302339	-2.938987	1(0)
EXR	-3.826038	-2.941145	1(1)

Source: Author's computation using EViews 10

The Augmented Dickey-Fuller unit root test result presented on table 1 showed that all the variables in the model, (UNEMP, PRIME, and EXR,) were all stationary at their first difference except MRR that was stationary at level. This is because their various ADF test statistic were greater than their 5% critical values in absolute terms.

Table 2 ARDL Bounds Test

Sample: 1981 – 2020		
Included observations: 36		
Null Hypothesis: No long run -relationships exist		
Test Statistic	**Value**	**K**
F-statistic	4.993688	3
Critical value bounds		
Significance	**1(0) bound**	**1(1) bound**
10%	2.37	3.2
5%	2.79	3.67
2.5%	3.15	4.08
1%	3.65	4.66

Source: Author's computation using EViews 10

The unit test result revealed that the data used in the work is a combination of 1(0) and 1(1). This implies that the date set is a combination of stationarity and non- stationarity data. It is for this that the bound test was applied to determine the existence of long run equilibrium relationship among the variables. The result on table 2 revealed that there is a presence of co-integrating relationship among the Variables in the model since the null hypothesis of no long run relationship could not be accepted because the upper and lower Critical Value bounds at all levels of significance is less than the value of F-Statistic. This implies that UNEMP, PRIME, MRR and EXR have a long run relationship. This justifies the need to estimate both short run and long run relationship among these variables in this study.

The estimated short run coefficient result as showed in table 3 revealed that PRIME has a positive and insignificant impact on unemployment rate. The result also showed that

One period lag of PRIME, two periods lag of PRIME and three periods lag of PRIME all have a negative and significant impact on unemployment rate while MRR has a negative and insignificant impact with unemployment rate. The result also showed that one period lag of MRR and two periods lag of MRR have a positive and significant impact on unemployment rate while three periods lag of MRR has a positive and insignificant impact on unemployment rate.

Table 3 Estimated Short Run ARDL (1, 4, 4, 0)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(PRIME)	0.147819	0.164400	0.899142	0.3779
D(PRIME(-1))	-1.049348	0.310486	-3.379689	0.0026
D(PRIME(-2))	-0.753991	0.256670	-2.937589	0.0074
D(PRIME(-3))	-0.394312	0.194031	-2.032217	0.0538
D(MRR)	-0.174041	0.193260	-0.900553	0.3772
D(MRR(-1))	1.748097	0.442795	3.947865	0.0006
D(MRR(-2))	1.207418	0.367874	3.282153	0.0033
D(MRR(-3))	0.339334	0.243651	1.392705	0.1770
ECM(-1)*	-0.818454	0.151175	-5.413943	0.0000
R-squared	0.598366	Mean dependent var		0.066944
Adjusted R-squared	0.479363	S.D. dependent var		4.399725
S.E. of regression	3.174629	Akaike info criterion		5.360576
Sum squared resid	272.1132	Schwarz criterion		5.756456
Log likelihood	-87.49038	Hannan-Quinn criter.		5.498749
Durbin-Watson stat	1.846685			

The error correction model (ECM) which shows the speed of adjustments back to equilibrium in the estimated model is correctly sign and is significant. The speed of adjustment for correcting disequilibrium from the previous year to equilibrium in current year is 81.9 percent as shown by the coefficient of ECM. In another words, this implies that an approximately 81.9 percent of disequilibrium from the previous year's shock converge to the long-run equilibrium in the current year.

Table 4 Estimated Long Run Coefficient of ARDL (1, 4, 4, 0) result

Variable	Coefficient	Std. Error	t-Statistic	Prob.
PRIME	1.721402	0.409488	4.203788	0.0003
MRR	-2.855038	0.444479	-6.423343	0.0000
EXR	0.014472	0.007464	1.938892	0.0649
C	13.14217	4.570141	2.875660	0.0085
EC = UNEMP - (1.7214*PRIME -2.8550*MRR + 0.0145*EXR + 13.1422)				

The estimated long run coefficient result in table 4 showed that prime rate (PRIME) has a positive and significant impact with unemployment rate. The positive coefficient of PRIME is in agreement with the aprior expectation. Minimum rediscount rate (MRR) has a negative and significant impact with unemployment rate. The negative coefficient of MRR is in agreement with the aprior expectation. The result also showed that exchange rate (EXR) has a positive and insignificant impact on unemployment rate. The positive coefficient of EXR is in agreement with the aprior expectation. The result showed that a unit increase in prime rate will on the average bring about 1.721402 units increase in unemployment rate while a unit increase in minimum rediscount rate will on the average bring about 2.855038 units

reduction in unemployment rate. The result also revealed that a unit increase in exchange rate will on the average bring about 0.014472 increases in unemployment rate.

4. Conclusion

The study examined the impact of monetary policy on unemployment rate in Nigeria for the period 1981–2020.The estimated short run coefficient result revealed that PRIME has a positive and insignificant impact on unemployment rate while two periods and three periods lag of prime has a negative and significant impact on unemployment rate in Nigeria. The result also revealed that MRR has a negative and insignificant impact on unemployment rate while one period lag and two periods lag of MRR have a positive and significant relationship with unemployment rate. Three lag periods of MRR has a positive and insignificant relationship with unemployment rate in Nigeria. The long run result showed that PRIME has a positive and significant impact on unemployment rate. The result equally revealeede that MRR has a negative and significant impact on unemployment rate in Nigeria while EXR has a positive and insignificant impact on unemployment rate in Nigeria. The error correction model (ECM) which shows the speed of adjustments back to equilibrium in the estimated model is correctly sign and is significant. The speed of adjustment for correcting disequilibrium from the previous year to equilibrium in current year is 81.9 percent as shown by the coefficient of ECM. In another words, this implies that an approximately 81.9 percent of disequilibrium from the previous year's shock converge to the long-run equilibrium in the current year.

Recommendations

Based on these findings, the study recommended that the monetary authority should come up with policies that will reduce minimum rediscount rate as this will encourage borrowing of funds for investment purposes and this will help to reduce unemployment rate. Monetary authorities should also come up with policies that will stabilize exchange rate

Compliance with ethical standards

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Disclosure of conflict of interest

There is no conflict of interest in this work.

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