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MACROECONOMIC POLICIES AND UNEMPLOYMENT IN NIGERIA

By

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Abstract
The "study investigated the impact of macroeconomic policies (selected fiscal and monetary policies) on unemployment in Nigeria between 1981 and 2023. The study utilised annual time series data sourced from the Central Bank of Nigeria Statistical Bulletin 2023 edition. The data were analysed using Vector Autoregressive (VAR) model. Findings revealed that macroeconomic policy variables such as government expenditure (GEXP), tax revenue (TAXREV), and Broad money supply (MS) have negative but significant impact on unemployment rate in Nigeria over the study period. While variables such as lending rate (R) has a significant positive impact on unemployment rate in Nigeria. Government transfer payments (GTRF) on the other hand had a positive but insignificant impact on unemployment rate in Nigeria over the period of the study. The study thus concludes that macroeconomic policies such as government expenditure, tax and broad money supply are veritable tools to reduce the soaring unemployment rate in Nigeria. Thus, it is recommended for the Nigerian government to increase its expenditure in the productive sectors of the economy and cut down its transfer payments."

Keywords: *Macroeconomic Policies, Unemployment and Nigeria.*

Introduction

Developing economies all around the world including Nigeria are faced with challenges of unemployment, resulting to low economic growth and instability, aside from struggling to achieve structural transformation to suit the demands of the economies of the twenty-first century. Despite the availability of several employment theories and models, in addition to fiscal and monetary policies in the arsenal of the authorities, these economies have not been able to achieve full employment. They still get hurt by external shocks and internal destabilization.

The effect of unemployment leading to low income, high level of inequality and poverty on a larger scale (Stiglitz, 2001).

In Nigeria, despite several fiscal policy and monetary policy measures used by government to curb unemployment, yet the issue has been on the rise. Statistically, unemployment rate rose sharply from 3.9% in 1998 to 13.1% in 1999. This ugly upward spree continued till 2011 when unemployment peaked 23.9%. Although a downward trend was observed in 2012, 2013 and 2014 as unemployment recorded 10.6%, 10% and 7.8% respectively, a sharp reversal was experienced in the following years as unemployment recorded 9.9% and 12.1% in 2015 and 2016 respectively. The report further shows that unemployment rose to 18.9% and 23.1% in 2017 and 2018 respectively. As of 2020, the unemployment rate rose to 33.7% (NBS, 2020). In comparison to —the other 181 countries of the world with up-to-date labour data, Nigeria‘s unemployment rate ranks as the 41st country with the highest unemployment rate.

Applying the —International Labor Organization‘s metric, Nigeria’s recent unemployment rate is 11.7%. Also using this, Bosnia and Herzegovinian (34.3%) have the highest unemployment rate in the world, closely followed by Namibia (33.4%) and Angola (32.0%). Conversely, the countries with the lowest unemployment rates are Qatar (0.1%), Niger (0.3%) and Laos (0.6%) (NBS, 2023). Nigeria was reported to be the headquarters of poverty (World Poverty Clock, 2018) which confirm the high growing rate of unemployment till date.

Several —studies have been examined by researchers on the impact of fiscal and monetary policy on unemployment rate in both developed and developing countries. However, most studies focused on either the relationship between fiscal policy and unemployment or monetary policy and unemployment or between monetary policy and growth. For instance, the works of Egbulonu and Amadi (2016); Holden and Sparrman (2016); Folawewo and Adeboje (2017) focused on the impact of fiscal policy on unemployment rate. Furthermore, the works of Stockhammer and Sturn (2011) and Amassoma and Esther (2015) focused on the impact of monetary policy on unemployment rate. Also, the works of Nasko (2016); Ufoeze, Odimgbe, Ezeabalisi and Alajekwu (2018) and Ayodeji and Oluwele (2018) focused on the impact of monetary policy on economic growth in Nigeria. Despite the several studies that have been carried out on the subject matter and the various monetary and fiscal policy measures, unemployment, from the statistics is still rising such that report from various Local and International organizations, confirmed that in recent time, unemployment in Nigeria is very alarming and calls for serious concerns (Kayode, Arome & Anyio, 2014 cited in

Baghebo and Azebi, 2022). However, the differences in their approaches call for further investigation. Hence, this study intends to fill this gap by examining holistically the impact of macroeconomic policies (fiscal and monetary policies) on unemployment rate in Nigeria.

Literature Review

Theoretical Literature

Keynesian Theory of Unemployment

The ideas of ―the British economist, John Maynard Keynes in 1930 have revolutionized thinking in several areas of macroeconomics including unemployment, money supply, and inflation this is seen in his publication of 1936 as the general theory of unemployment interest and money. Cyclical or Keynesian unemployment, also known as demand deficient unemployment, occurs when there is no aggregate demand in the economy. It gets its name because it varies with the business cycle, though it can also be persistent as during the great depression of the 1930s. Cyclical unemployment rises during economic downturn and falls when the economy improves. Keynes argues that this type of unemployment exists due to inadequate effective demand. Demand for most goods and services falls, less production is needed; wages do not fall to meet the equilibrium level and mass unemployment results.

Veblen's Theory of Unemployment in the Theory of Effective Demand

This theory was propounded by Thorstein Veblen in 1904. ―According to Mouhammed (2012), Veblen points out that the volume of output is set to attain a satisfactory profit and is a manifestation of the predatory instinct of the vested interests which aim at domestic and international dominance. But how is this volume of production determined to achieve reasonable profits? Veblen gives a lucid answer. He accurately realizes, and before Lord Keynes reaches a similar conclusion, that vested interests determine the volume of output after taking into consideration the aggregate demand. As Veblen (1904: 195) explains: In part by actual increase of demand and in part through a lively anticipation of an advanced demand, aggressive business enterprise extends its venture, and ―the 'venture', of course, means extending production and operations, assuming the existence of a reasonable level of profits. The level of aggregate demand will provide the necessary increases in total revenues. On the other hand, the cost of production must decline. If revenue rises and costs decline, then a reasonable level of profits can be found. There are various forces in Veblen‘s work that reduce the cost of production. Technology increases production and reduces the cost of input used in the production process, and enterprises cut wages and increase productivity to cut cost per unit of output. Better technology can reduce the prices of capital goods,

and the government can cut taxes. Banks can reduce the interest rates as well. Administrative and insurance costs can be reduced to stimulate business enterprises. The decline in costs, given the rise in revenues, will increase the profit level for Veblen.‖ Consequently, ―higher profits will force the business enterprises to expand and employ more workers. Thus, employment will increase, and the rate of unemployment will decline. Veblen's analysis of unemployment is grounded in his theory of the business cycle which can be explained by revenue and cost of production. Mouhammed (2012) suggests that the important variables to achieve an increase in the level of employment and reduction in unemployment are increase in aggregate demand, provision of cheap loan to businesses, reduction in taxes etc. This implies that government can play a significant role in employment increase and creation unlike the classical view.

The New Keynesian Macro-Economic Model

The founder of this theory is John Maynard Keynes (1883–1946). ―This school of economic thought sprang up in the 1980s after the New Classical, such as Robert Lucas and Thomas Sargent critiqued some existing traditional Keynesian ideas. For example, the Keynesian's developed and estimated large scale macro econometric models that could be used to predict and forecast the impact of policy. Critics like Robert Lucas believed that the specified model lacked a theoretical foundation and that estimated parameters in such models will vary in response to changes in policy intervention. This variation implies that policy recommendation is time-inconsistent and is regarded as a potential drawback to policy analysis and forecast. Lucas argued for the formulation of structural econometric models with a strong theoretical underpinning and micro foundation that captures an economy's structure. This requires developing models that capture the forward-looking and optimizing behaviour of economic agents in macroeconomic models to be used for policy analysis.

Empirical Literature

Ikechukwu, Agu and Udu (2021) examined the impact of fiscal policy ―instrument on unemployment in Nigeria using time series annual data from 1990- 2020. Fiscal policy instrument was proxy by government expenditure, government borrowing and Taxation. The data were analyzed using ADF unit root test, co-integration test and ARDL Model. The study found that Government Borrowing has a positive and no significant effect on Unemployment in Nigeria, Taxation has a positive and no significant impact on Unemployment in Nigeria, while Government Expenditure has a positive and no significant impact on Unemployment in Nigeria. ―Adekoya (2017) empirically examined the impact of fiscal fundamental on unemployment in Nigeria from 1981 to 2015. The result shows that government expenditure (GX)

and interest rate (IR) exerts significant positive impact on unemployment rate in Nigeria while government revenue (GR) and public debt (PDT) has insignificant positive impact on unemployment rate in Nigeria. The result equally shows that unemployment granger cause government expenditure and government revenue in Nigeria. He concluded that fiscal fundamentals do not granger cause the rate of unemployment in the country, thus, the past values of government expenditure, government revenue and public debt does not significantly influence the rate of unemployment in the country.‖

In another study, Ekong, Okon and Effiong (2019) examined ―the impact of fiscal policy on unemployment in Nigeria for the period 1990-2018 with a view to ascertaining the effectiveness of fiscal policy tools in counteracting the problem of unemployment. The study used unemployment rate as the dependent variable; tax revenue, capital expenditure, recurrent expenditure and external debt as proxies for fiscal policy while inflation rate and exchange rate were introduced as control variables. Stationarity tests were carried out on the variables using the Augmented Dicker Fuller and Phillips-Perron Tests and the Johansen Co-integration Test was employed to ascertain the short-run and long-run relationship among the co-integrating equations. The OLS estimate was employed to determine the relationship between the dependent and independent variables. It was found that capital expenditure, recurrent expenditure, external debts, inflation rate and exchange rate have a positive relationship with unemployment in the long-run, only tax revenue was found to have a negative relationship with unemployment rate in Nigeria. However, in the short-run, capital expenditure, recurrent expenditure and external debts reduced unemployment rate whereas inflation rate, exchange rate and tax revenue were positive. It recommended among others that borrowed funds be used only for the intended productive purposes.‖

Ikechukwu and Agu (2021) ―examined the impact of fiscal policy instrument on unemployment in Nigeria using time series annual data from 1990- 2020 which constitutes 30 years observations. This study used secondary data obtained from the CBN annual statistical bulletin. Fiscal policy instrument was proxy by government expenditure, government borrowing and Taxation. The data were analysed using ADF unit root test, co-integration test and ARDL Model. The study found that Government Borrowing has a positive and no significant effect on Unemployment in Nigeria, Taxation has a positive and no significant impact on Unemployment in Nigeria, Government Expenditure has a positive and no significant impact on Unemployment in Nigeria.‖ The study recommended that the Government should aggressively focus on investment, employment generation and economic growth that has mechanism to improve standard of living.

Okeke and Chukwu (2021) ―examined the effect of monetary policy instruments on unemployment in Nigeria (1986-2018). The study adopted an Autoregressive Distributed Lag technique using monetary policy rate, broad money supply, exchange rate, liquidity ratio and cash reserve ratio as independent variables while unemployment rate as dependent variable. The study found that cash reserve ratio and monetary policy rate had positive and insignificant effect on the employment rate in Nigeria, broad money supply had positive and significant effect on the employment rate in Nigeria, exchange rate and liquidity ratio had negative and significant effect on the employment rate in Nigeria. The study concluded among others that monetary policy has significant effect on the rate of unemployment and recommended that the Monetary policies should be used to create a favourable investment climate by facilitating the emerging of market-based interest rate and exchange rate administration that will attract both domestic and foreign investments and create jobs.‖

Ali, Ali, Nosheen, and Din (2021) ―examined the impact of monetary policy on unemployment in Pakistan. The time-series data for 1977 to 2019 was taken and the ARDL technique was used for estimation. Unemployment was used as a dependent variable along with other control variables while the money supply was the core independent variable of the research. The results of the study revealed that Bank Credit to Private Sector affects unemployment negatively, the exchange rate affects unemployment negatively, Money supply growth has a decreasing effect on unemployment. Also, results indicated that there is a significant and negative relationship between budget deficit and unemployment, GDP growth rate is positively related to unemployment, the population growth rate is negatively related to unemployment and the consumer price index is negatively related to unemployment. Based on the result, the study recommended that the government of Pakistan should manage a stable exchange rate, and that rapidly increasing population should also be controlled so that limited resources in the developing countries could be efficiently and maximally utilised.‖

Alege, Ayobami and Ejemeyovwi (2021) investigated the connection ―between macroeconomic policies and unemployment in Nigeria using the Autoregressive Distributed Lag (ARDL) estimation technique. The study finds that government capital expenditure helps to reduce unemployment in the long run only. On the other hand, the currency in circulation and the real GDP help to reduce the unemployment rate in both the short and the long run.‖

Employing ARDL Bound Test techniques, Baghabo and Azebi, (2021) examined the impact of fiscal and monetary policy on unemployment in Nigeria. Money

supply, Interest rate, government expenditure and government taxes were independent variables while, unemployment is the dependent variable. The ARDL bound test revealed that there in no long run relationship between the variables. The result of the short run showed that the independent variables have positive but insignificant impact on unemployment but, only the lagged unemployment have positive significant impact on unemployment in Nigeria.

Also, Onwuka (2021) examined the impact of fiscal and monetary policy on unemployment rate using time series data sourced from CBN ranging from 1981 to 2020 with Vector Autoregressive (VAR) model as the major statistical technique of analysis. ―From the findings, the coefficient of determination (R^2) of 0.652 showed that about 65 percent variations in the unemployment rate were 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 confirmed that the overall test is significant. More so, government expenditure and interest rate has a 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 effect at lag period 1. By implication, the findings revealed that government expenditure, money supply and interest rate are major determinants of unemployment rate in Nigeria. The study concluded that there is need for diverse strategies that will be targeted towards employment creation in Nigeria.‖

Literature Gap

From the review of empirical evidence, we discovered that most of the studies such as Ikechukwu, Agu and Udu (2021), Okeke and Chukwu (2021), etc. are more concentrating on separate policy implication on unemployment in Nigeria. There are limited empirical evidence on the combine macroeconomic policies measures (Alege, Ayobami & Ejemeyovwi, 2021; Baghabo & Azebi, 2022; Onwuka, 2021) in addressing unemployment, hence, this study intends to add to literature on the impact of monetary and fiscal policies on unemployment in Nigeria. Moreover, we have decided to modify our variables to include government transfer payment as a productive fiscal measure in addressing unemployment in our economy being catalyst of SMEs and employment creation. In the same vein, none of the study‘s scope has extended to 2023 as this study intends.

Methodology

Research Design

The research design adopted in this study is the expos facto research design. This design was adopted based on the nature of the variables of the study.

Data Sources and Nature of Data Collection

The ―study is based on time series annual data sourced from secondary sources. These sources comprise of national and international, which include the Central Bank of Nigeria statistical bulletin of various volumes and international financial statistics of the World Bank development indicators for the country. The period cover for the study ranges from 1981 to 2023, which is about forty-three years.

Model Specification

To achieve the objectives of this study, the following model was developed from the works of Egbulonu and Amadi (2016); Onwuka (2021); Alege, Ayobami & Ejemeyovwi (2021) with little modifications. The functional model is given as:

$$UNEMP = f(GEXP, TAXREV, GTRF, MS, R, ER) \quad 3.1$$

$$UNEMP = \rho + \pi_1 GEXP + \pi_2 TAXREV + \pi_3 GTRF + \pi_4 MS + \pi_5 R + \pi_6 ER + \mu \quad 3.2$$

Where UNEMP is Unemployment rate as defined above, GEXP is government total expenditure, TAXREV is tax revenue, GTRF is government transfer payment, MS is broad money supply, ER is exchange rate as control variables in the model, and R is market lending rate, μ is the random term.

Method of Analysis

The data obtained were analysed using the Vector Autoregressive (VAR) model

Results and Discussions

Descriptive Statistics

The presentation of the descriptive properties of the data used in the study are presented in table 4.1 below.

Table 4.1: Descriptive statistics of unemployment rate and selected macroeconomic variables

	UMEMP	ER	GEXP	GTRF	MS	R	TAXREV
Mean	13.36095	123.8160	2754.583	981.1098	8955.114	17.17071	1374.045
Median	12.65000	125.0000	1018.100	296.3000	1387.640	17.10000	500.9000
Maximum	32.50000	423.0000	13426.10	5943.630	42931.78	29.80000	6600.000
Minimum	1.900000	0.610000	9.600000	3.860000	14.47000	7.750000	3.000000
Std. Dev.	8.983154	117.3916	3573.873	1465.863	12900.99	4.600309	1827.201
Skewness	0.584805	0.965988	1.460387	2.029039	1.326354	0.348241	1.369799
Kurtosis	2.316698	3.184497	4.326732	6.530403	3.446047	3.587123	3.971265
Jarque-Bera	3.211053	6.591500	18.00949	50.63055	12.66269	1.452150	14.78532
Probability	0.200784	0.037040	0.000123	0.000000	0.001780	0.483804	0.000616
Sum	561.1600	5200.270	115692.5	41206.61	376114.8	721.1700	57709.90
Sum Sq. Dev.	3308.579	565011.8	5.24E+08	88098922	6.82E+09	867.6767	1.37E+08
Observations	43	43	43	43	43	43	43

Source: Author's computation from Eviews 10.

Table 4.1 gives us an understanding of the nature of data used in this study. Between 1981 and 2023, which is the period of this study, the minimum or least unemployment rate recorded in Nigeria was 1.9 percent, while the highest was 32.5

percent. On average, unemployment rate was 13.36 percent between 1981 and 2023. The distribution of the unemployment data (UMEMP) for the study period is normal judging from both the Kurtosis and Jargue-Bera statistics values of 2.31 and 3.21 respectively. The corresponding probability value of the Jargue-Bera statistic for UMEMP (0.20), which is greater than 0.05, also confirms that the unemployment data for the study period is normally distributed. It is also worthwhile noting that the data for the unemployment variable (UMEMP) is positively skewed, which is evidenced by the skewness statistic value of 0.58.
Also, from Table 4.1, the minimum or least exchange rate (ER) recorded in Nigeria was 61kobo to the Dollar, while the highest was ₦423 to the Dollar. On the average, exchange rate in Nigeria was ₦123.81 to the dollar between 1981 and 2023. The distribution of the exchange rate data (ER) for the study period is not normal judging from both the Kurtosis and Jargue-Bera statistics values of 3.18 and 6.59 respectively. The Kurtosis statistic value of 3.18 indicates that the series (ER) has a fat tail (i.e., leptokurtic), which is further corroborated by the corresponding probability value of the Jargue-Bera statistic for ER (0.03), which is less than 0.05 also confirms that the exchange rate data for the study period is not normally distributed. It is also worth noting that the data for the exchange rate (ER) is positively skewed, which is evidenced by the skewness statistic value of 0.96.

Similarly, Table 4.1 shows that the minimum or least monetary value of expenditure by the Nigerian government (GEXP) recorded was in the tune of 9.6 billion naira, while the highest was 13,426.10 billion naira. On the average, total government expenditure in Nigeria was 2,754.58 naira between 1981 and 2023. The distribution of the government expenditure data (GEXP) for the study period is not normal judging from both the Kurtosis and Jargue-Bera statistics values of 4.32 and 18.009 respectively. The Kurtosis statistic value of 4.32 indicates that the series (GEXP) also has a fat tail (i.e., leptokurtic), which is further corroborated by the corresponding probability value of the Jargue-Bera statistic for GEXP (0.000), which is less than 0.05, and it also confirms that the government expenditure data for the study period is not normally distributed. It is also worthy of note that the data for the government expenditure (GEXP) is positively skewed, which is evidenced by the skewness statistic value of 1.46.

The minimum or least monetary value of government transfer payments (GTRF) recorded during the period of the study was in the tune of 3.86 billion naira, while the highest was 5,943.63 billion naira. On the average, government transfer payments in Nigeria were 981.10 billion naira between 1981 and 2023. The distribution of the government transfer payments (GTRF) for the study period is not normal judging from both the Kurtosis and Jargue-Bera statistics values of 6.53 and 50.63 respectively. The Kurtosis statistic value of 6.53 indicates that the series (GTRF) has a fat tail (i.e., leptokurtic), which is further corroborated by the corresponding probability value of the Jargue-Bera statistic for GEXP (0.000),

which is less than 0.05, and it also confirms that the government expenditure data for the study period is not normally distributed. It is also worthy of note that the data for the government transfer payments (GTRF) is also positively skewed, which is evidenced by the skewness statistic value of 2.02.

Table 4.1, also reports the minimum or least monetary value of broad money supply (MS) for the period of the study to be in the tune of 14.47 billion naira, while the highest was 42,931.71 billion naira. On the average, broad money supply in Nigeria was 8,955.11 billion naira between 1981 and 2023. The distribution of the broad money supply variable (MS) for the study period is not also normal judging from both the Kurtosis and Jargue-Bera statistics values of 3.44 and 12.66 respectively. The Kurtosis statistic value of 3.44 indicates that the series (MS) also has a fat tail (i.e., leptokurtic), which is further corroborated by the corresponding probability value of the Jargue-Bera statistic for MS (0.001), which is also less than 0.05, and it also confirms that the broad money supply data for the study period is not normally distributed. It is also worthy of note that the data for the broad money supply (MS) is also positively skewed, which is evidenced by the skewness statistic value of 1.32.

Lastly, Table 4.1 also reports the minimum or least value of market lending rate (R) for the period of the study to be 7.75 percent, while the highest was 29.80 percent. On the average market lending rate in Nigeria for the period of the study was 17.17 percent. The Kurtosis statistic value for the variable, market lending rate (R) shows that the series is leptokurtic in nature. The distribution of the market lending rate variable (R) for the study period is seen to be normal judging from the Jargue-Bera statistics values of 1.45. This is further corroborated by the corresponding probability value of the Jargue-Bera statistic for R (0.48), which is also greater than 0.05, and it also confirms that the market lending rate data for the study period is normally distributed. It is also worthy of note that the data for the market lending rate (R) is also positively skewed which is evidenced by the skewness statistic value of 0.34.

Unit Root Test Result

Table 4.2: Unit root test result (ADF and PP tests)

	Augmented Dickey-Fuller Test				Phillips-Perron Test				
Series	Levels	First Diff.	5% C.V	Ord. of Int.	Levels	First Diff.	5% C.V	Ord. of Int.	Decision
ER	-0.407	-5.491	-3.526	I(1)	-0.413	-5.686	-3.526	I(1)	Accept
Log(GEXP)	-0.404	-8.078	-3.526	I(1)	-0.780	-7.954	-3.526	I(1)	Accept
Log(GTRF)	-2.363	-8.704	-3.526	I(1)	-2.177	-9.930	-3.526	I(1)	Accept
Log(MS)	-1.277	-4.026	-2.936	I(1)	-0.504	-4.178	-3.526	I(1)	Accept
R	-3.405	-6.541	-3.529	I(1)	-3.308	-10.418	-3.526	I(1)	Accept
Log(TAXREV)	-0.880	-4.772	-3.536	I(1)	-1.429	-8.183	-3.526	I(1)	Accept
UMEMP	-2.170	-4.782	-3.526	I(1)	-2.297	-4.782	-3.526	I(1)	Accept

Source: Author's computation from Eviews 10

Table 4.2 —shows the unit root results for the variables of the study using both the

Augmented Dickey-Fuller and Phillips-Perron Tests. From both tests as shown in Table 4.2, all the variables of the study were not stationary in their respective level forms. Meaning that the series all do not have unit root in their various level forms. However, after differencing once, all the series became stationary. That is, all the variables of the study became stationary after first difference, implying that they are stationary of order one (i.e., I(1)). Since all the variables are stationary of I(1), it is a sufficient condition to test for the long-run properties of the variables used in the study. Thus, the Johansen co-integration test was conducted, and the result is presented in Table 4.3 below.‖

Table 4.3: Johansen Co-integration test result

Included observations: 39 after adjustments
Trend assumption: Linear deterministic trend (restricted)
Series: UNEMP(-1) LOG(GEXP(-1)) LOG(GTRF(-1)) LOG(TAXREV(-1)) LOG(MS(-1)) ER(-1) R(-1)
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 *	0.861670	280.8402	187.4701	0.0000
At most 1 *	0.838037	203.6937	150.5585	0.0000
At most 2 *	0.699901	132.6987	117.7082	0.0040
At most 3	0.551860	85.75658	88.80380	0.0813
At most 4	0.405942	54.45329	63.87610	0.2397
At most 5	0.336652	34.14291	42.91525	0.2820
At most 6	0.288430	18.13512	25.87211	0.3349

—Trace test indicates 3 cointegrating eqn(s) at the 0.05 level‖
—* denotes rejection of the hypothesis at the 0.05 level‖
—**MacKinnon-Haug-Michelis (1999) p-values‖

Source: Author's Computation Using Eviews 10

The Johansen cointegration test result displayed on Table 4.3 shows the presence of three (3) cointegrating equations. From the trace test result on Table 4.3, the presence of three cointegrating equations is established as the trace test statistics values (280.84, 203.69, and 132.70) for the first three (3) hypothesized number of cointegrating equations (that is, _none', _at most 1', and _at most 2') are all greater than their corresponding 5 percent critical values of 187.47, 150.55, and 117.70 respectively. This is also corroborated by their corresponding probability values (0.000, 0.000, and 0.004). Thus, the null hypothesis of _no cointegrating equation' for the Johansen test is rejected using the trace test.

Similarly, the maximum eigen value test result on the same Table 4.3 also shows the presence of three (3) cointegrating equations as the max-eigen statistics values (77.14, 70.99, and 46.94) for the first three (3) hypothesized number of cointegrating equations (that is, _none', _at most 1', and _at most 2') are all greater

than their corresponding 5 percent critical values of 56.70, 50.59 and 44.49 respectively. This is also corroborated by their corresponding probability values (0.000, 0.000, and 0.026). Thus, the null hypothesis of _no cointegrating equation' for the Johansen test is rejected using the maximum Eigen value test.

From the above, it is concluded that there exists a long-run relationship among the variables used in this study. This meets both the necessary and sufficient conditions for the estimation of the error correction model. Since the main purpose of this study was to examine the impact of macroeconomic variables on unemployment rate in Nigeria, the study assumed all the variables as endogenous variables. With the presence of cointegrating equations, the Vector Error Correction Model (VECM) was estimated, and the result is presented in Table 4.4 below to establish both the short-run and long-run behaviours of the variables in equation 3.2.

Table 4.4: Vector Error Correction result

Vector Error Correction Estimates
Included observations: 40 after adjustments
Standard errors in ( ) & t-statistics in [ ]

Cointegrating Eq:	CointEq1
UMEMP(-1)	1.000000
LOG(GEXP(-1))	77.25257 (9.41910) [8.20169]
LOG(GTRF(-1))	-30.99710 (5.40036) [-5.73982]
LOG(TAXREV(-1))	46.49023 (6.28728) [7.39433]
LOG(MS(-1))	-20.25694 (6.93710) [-2.92009]
R(-1)	-1.978569 (0.40180) [-4.92423]
ER(-1)	0.120268 (0.02803) [4.29022]
C	-625.3884

Error Correction:	D(UMEMP)	D(LOG(GEXP))	D(LOG(GTRF))	D(LOG(TAXREV))	D(LOG(MS))	D(R)	D(ER)
CointEq1	-0.119549 (0.05176)	-0.011706 (0.00265)	-0.010327 (0.00364)	-0.015876 (0.00416)	-0.004356 (0.00181)	-0.147209 (0.06204)	-0.271504 (0.34827)

	[-2.30967]	[-4.41735]	[-2.83714]	[-3.81634]	[-2.40511]	[-2.37281]	[-0.77957]
D(UMEMP(-1))	0.202469	-0.029131	-0.014208	-0.010724	-0.001084	-0.076080	1.906098
	(0.20639)	(0.00885)	(0.01216)	(0.01391)	(0.00605)	(0.20732)	(1.16383)
	[0.98098]	[-3.29264]	[-1.16805]	[-0.77074]	[-0.17904]	[-0.36697]	[1.63778]
D(LOG(GEXP(-1)))	-1.342735	-0.144136	-0.667161	-0.393242	-0.100850	0.642951	-13.94455
	(0.25588)	(0.21244)	(0.29207)	(0.33409)	(0.14531)	(4.97806)	(27.9454)
	[-5.24752]	[-0.67847]	[-2.28423]	[-1.17705]	[-0.69402]	[0.12916]	[-0.49899]
D(LOG(GTRF(-1)))	0.647833	0.055472	-0.159249	0.042394	-0.043426	-1.646106	-6.893522
	(2.86711)	(0.12290)	(0.16897)	(0.19328)	(0.08407)	(2.87995)	(16.1672)
	[0.22595]	[0.45135]	[-0.94246]	[0.21934]	[-0.51656]	[-0.57158]	[-0.42639]
D(LOG(TAXREV(-1)))	-3.310033	0.024617	0.288393	-0.027860	0.156587	-1.393668	-7.544105
	(1.28269)	(0.12357)	(0.16989)	(0.19433)	(0.08452)	(2.89559)	(16.2551)
	[-2.58054]	[0.19922]	[1.69753]	[-0.14336]	[1.85259]	[-0.48131]	[-0.46411]
D(LOG(MS(-1)))	-5.783670	0.419900	0.027406	0.956484	0.311555	6.775353	-14.74793
	(2.28866)	(0.22671)	(0.31168)	(0.35653)	(0.15507)	(5.31233)	(29.8219)
	[-2.52709]	[1.85217]	[0.08793]	[2.68278]	[2.00914]	[1.27540]	[-0.49453]
D(R(-1))	4.162282	0.024329	0.001467	0.007776	-0.006732	-0.341656	0.057233
	(1.19081)	(0.00818)	(0.01125)	(0.01286)	(0.00559)	(0.19167)	(1.07597)
	[3.49533]	[2.97440]	[0.13047]	[0.60453]	[-1.20333]	[-1.78255]	[0.05319]
D(ER(-1))	-0.029240	-0.000250	0.001029	-0.000289	0.000222	-0.003953	0.211472
	(0.03157)	(0.00135)	(0.00186)	(0.00213)	(0.00093)	(0.03171)	(0.17800)
	[-0.92633]	[-0.18481]	[0.55318]	[-0.13564]	[0.23933]	[-0.12466]	[1.18808]
C	0.687053	0.098853	0.208574	0.082339	0.109659	-0.218940	16.73782
	(1.40257)	(0.06012)	(0.08266)	(0.09455)	(0.04112)	(1.40885)	(7.90887)
	[0.48985]	[1.64417]	[2.52328]	[0.87083]	[2.66651]	[-0.15540]	[2.11634]

Source: Author's computation using Eviews 10.

Long-Run Interaction Between Macroeconomic Variables and Unemployment rate in Nigeria

Table 4.4 ―presents both the long-run and short-run coefficients of the relationships between the macroeconomic variables and unemployment rate in Nigeria. The first part of Table 4.4 presents the long-run relationship that exits between the macroeconomic variables and unemployment rate in Nigeria. It should however be noted that in interpreting this section of Table 4.4, the coefficients of the variables should be interpreted by reversing their respective signs as the long-run model shows the speed of convergence or adjustment or reversal that takes place in the event of any disequilibrium in the model.‖

The result from the cointegrating equation ―(that is, the long-run equation) in Table 4.4 shows that government expenditure (GEXP) and unemployment are inversely related as expected. It shows that a one percent increase in government expenditure would lead to about 77.25 percent reduction in unemployment rate in the long run. This assertion is made because the coefficient of GEXP (77.25) is positive (note: in interpretation, the sign is reversed, thus, it is interpreted as having a negative impact on unemployment rate in the long run). The long-run relationship between unemployment rate (UMEMP) and government expenditure is seen to be

statistically significant at 5 percent level as the t-statistic value for GEXP (8.20) is greater than 2. As a rule of thumb, once the t-statistic value of a variable is 2 and above, it can be concluded that the variable is statistically significant at the 5 percent level. Government transfer payments (GTRF) was seen to ―have a positive impact on unemployment rate in the long-run. This is contrary to expectation. It shows that a one percent increase in government transfer payments would lead to about 30.99 percent increase in unemployment rate in the long run. This assertion is made because the coefficient of GTRF (30.99) is negative (note: in interpretation, the sign is reversed, thus, it is interpreted as having a positive impact on unemployment rate in the long run). This means that a one percent increase in government transfer payments in the long run would lead to about 30.99 percent increase in unemployment rate in Nigeria. The long-run relationship between unemployment rate (UMEMP) and government transfer payments is seen to be statistically significant at the 5 percent level as absolute value of the t-statistic for GTRF (5.73) is greater than 2. As a rule of thumb, once the t-statistic value of a variable is 2 and above, it can be concluded that variable is statistically significant at the 5 percent level.‖

The cointegrating equation (that is, the long-run equation) in Table 4.4 also shows that tax revenue (TAXREV) and unemployment are inversely related as expected. It shows that a one percent increase in government tax revenue would lead to about 46.49 percent reduction in unemployment rate in the long run. This assertion is also made because the coefficient of TAXREV (46.49) is positive (also note: in interpretation, the sign is reversed, thus, it is interpreted as having a negative impact on the unemployment rate in the long run). This shows that a one percent increase in tax revenue would lead to about 46.49 percent decrease in unemployment rate in the long run. The long-run relationship between unemployment rate (UMEMP) and government tax revenue is seen to be statistically significant at the 5 percent level as the absolute value of the t-statistic for TAXREV (7.39) is greater than 2. As a rule of thumb, once the t-statistic value of a variable is 2 and above, it can be concluded that the variable is statistically significant at the 5 percent level. This implies that with an increase in tax revenue, the government has more funds to increase it expenditure. Thus, this also supports the long-run relationship between government expenditure and employment rate as presented in Table 4.4.

For ―the long-run relationship between unemployment rate and broad money supply in Nigeria, it was seen that broad money supply (MS) is positively related with unemployment rate in Nigeria. This assertion is also made because the coefficient of MS (-20.25) is negative. However, in interpretation, the sign is reversed, thus, it is interpreted as having a positive impact on the unemployment rate in the long run. This implies that a one percent increase in broad money supply would lead to about 20.25 percent increase in the unemployment rate in the

long run. The long-run relationship between unemployment rate (UMEMP) and broad money supply is also seen to be statistically significant at 5 percent level as the absolute value of the t-statistic for MS (2.92) is greater than 2. As a rule of thumb, once the t-statistic value of a variable is 2 and above, it can be concluded that the variable is statistically significant at the 5 percent level.‖

Similarly, ―for the long-run relationship between unemployment rate and market lending rate in Nigeria, it was seen that market lending rate (R) is positively related with unemployment rate in Nigeria. This assertion is also made because the coefficient of R (-1.97) is negative. However, in interpretation, the sign is reversed, thus, the market lending rate (R) is interpreted as having a positive impact on unemployment rate in the long-run. This means that a one percent increase in market lending rate would result to about 1.97 percent increase in unemployment rate in the long-run. The long-run relationship between unemployment rate (UMEMP) and market lending rate (R) is also seen to be statistically significant at the 5 percent level as the absolute value of the t-statistic for R (4.92) is also greater than 2. As a rule of thumb, once the t-statistic value of a variable is 2 and above, it can be concluded that variable is statistically significant at the 5 percent level.‖

Finally, on Table 4.4, ―it could also be seen that in the long run, the unemployment rate (UMEMP) and exchange rate (ER) are inversely related. This assertion is also made because the coefficient of ER (0.12) is positive. However, in interpretation, the sign is reversed, thus, the exchange rate (ER) is interpreted as having an inverse relationship with the unemployment rate in the long run. This implies that a one percent increase in exchange rate in favour of the naira would result to about 0.12 percent reduction in unemployment rate in Nigeria in the long run. The long-run relationship between the unemployment rate (UMEMP) and exchange rate (ER) is also seen to be statistically significant at the 5 percent level as the absolute value of the t-statistic for ER (4.29) is also greater than 2. As a rule of thumb, once the t-statistic value of a variable is 2 and above, it can be concluded that the variable is statistically significant at the 5 percent level.‖

Short-Run Interactions Between Macroeconomic Variables and Unemployment Rate in Nigeria.

Again, the second part of Table 4.4 presents the short-run relationship that exits between the macroeconomic variables and unemployment rate in Nigeria. It should however be noted that in interpreting this section of Table 4.4, the coefficients of the variables should be interpreted normally without sign reversals.

The result from the short-run equation in Table 4.4 for unemployment rate (UMEMP) on other macroeconomic variables shows that government expenditure

(GEXP) and unemployment are inversely related as expected in the short-run. It shows that a one percent increase in government expenditure would lead to about 1.34 percent decrease in unemployment rate in the short run, all other things being equal. This assertion is made because the coefficient of GEXP (1.34) is negative. The short-run relationship between unemployment rate (UMEMP) government expenditure is seen to be statistically significant at 5 percent level as the absolute t-statistic value for GEXP (5.24) is greater than 2. As a rule of thumb, once the t-statistic value of a variable is 2 and above, it can be concluded that the variable is statistically significant at the 5 percent level.

Government transfer payments (GTRF) were seen ―to have a positive impact on unemployment rate in the short-run. This is contrary to expectation. It shows that a one percent increase in government transfer payments would lead to about a 0.64 percent increase in unemployment rate even in the short run. This assertion is made because the coefficient of GTRF (0.64) is positive. This means that a one percent increase in government transfer payments in the short-run would lead to about 0.64 percent increase in unemployment rate in Nigeria in the short-run, all other things being equal. The short-run relationship between unemployment rate (UMEMP) and government transfer payments is not statistically significant at the 5 percent level as the short-run absolute value of the t-statistic for GTRF (0.225) is less than 2. As a rule of thumb, once the t-statistic value of a variable is less than 2, it can be concluded that the variable is not statistically significant at the 5 percent level.‖
In Table 4.4 also, tax revenue (TAXREV) ―and unemployment are inversely related as expected. It shows that a one percent increase in government tax revenue would lead to about 3.31 percent reduction in unemployment rate in the short run, all things being equal. This is because the short-run coefficient of TAXREV (-3.31) is negative. This implies that a one percent increase in tax revenue would lead to about 3.31 percent decrease in unemployment rate in the short run, ceteris paribus. The short-run relationship between unemployment rate (UMEMP) and government tax revenue is seen to be statistically significant at the 5 percent level as the absolute value of the t-statistics for TAXREV (2.58) is greater than 2. As a rule of thumb, once the t-statistic value of a variable is 2 and above, it can be concluded that the variable is statistically significant at the 5 percent level. This implies that with an increase in tax revenue, the government has more funds to increase it expenditure in the short-run. Thus, this also supports the short-run relationship between government expenditure and employment rate as presented in Table 4.4.‖

For the short-run relationship between unemployment rate and broad money supply in Nigeria, it was observed that broad money supply (MS) is inversely

related with unemployment rate in Nigeria in the short-run. This is because the short-run coefficient of MS (-5.78) is negative. This implies that a one percent increase in broad money supply would lead to about 5.78 percent decrease in the unemployment rate in the short run. The short-run relationship between unemployment rate (UMEMP) and broad money supply is also seen to be statistically significant at 5 percent level as the absolute value of the t-statistic for MS (2.527) is greater than 2. As a rule of thumb, once the t-statistic value of a variable is 2 and above, it can be concluded that variable is statistically significant at the 5 percent level.

Similarly, for the ―short-run relationship between unemployment rate and market lending rate in Nigeria, it was seen that market lending rate (R) is positively related with unemployment rate in Nigeria. This assertion is made because the short-run coefficient of R (4.16) is positive. This means that a one percent increase in the market lending rate would result in about 4.16 percent increase in the unemployment rate in the short run, all other things being equal. Also. The short-run relationship between unemployment rate (UMEMP) and market lending rate (R) is seen to be statistically significant at 5 percent level as the absolute value of the t-statistic for R (3.49) is also greater than 2. ‖

Finally, in Table 4.4, ―it could be seen that in the short run, the unemployment rate (UMEMP) and exchange rate (ER) are inversely related. This assertion is also made because the short-run coefficient of ER (-0.029) is negative. This implies that a one percent increase in exchange rate in favour of the naira would result to about 0.029 percent reduction in unemployment rate in Nigeria in the short run, all other things being equal. The short-run relationship between the unemployment rate (UMEMP) and exchange rate (ER) is not statistically significant at the 5 percent level as the absolute value of the t-statistic for ER (0.92) is less than 2. As a rule of thumb, once the t-statistic value of a variable is less than 2 it can be concluded that the variable is statistically significant at the 5 percent level and vice versa.‖

The ―speed of adjustment of the model, which is captured by the coefficient of the variable (CointEq1) is negative as expected. It indicates that in the event of any disequilibria in the unemployment rate and macroeconomic model in the short-run, it would be corrected at the speed of 0.11 percent in the long-run. The error correction mechanism in the model is statistically significant as the absolute value of the corresponding t-statistic value for CointEq1 (2.309) is greater than 2.‖

Table 4.6: Pairwise Granger Causality Tests

Sample: 1981 2023
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
ER does not Granger Cause UMEMP	39	4.21863	0.0228
UMEMP does not Granger Cause ER		1.26214	0.2956
GEXP does not Granger Cause UMEMP	39	5.27715	0.0099
UMEMP does not Granger Cause GEXP		5.44288	0.0087
GTRF does not Granger Cause UMEMP	39	3.89688	0.0297
UMEMP does not Granger Cause GTRF		1.60569	0.2152
MS does not Granger Cause UMEMP	39	2.81209	0.0737
UMEMP does not Granger Cause MS		2.73475	0.0788
R does not Granger Cause UMEMP	39	0.80844	0.4537
UMEMP does not Granger Cause R		0.65763	0.5244
TAXREV does not Granger Cause UMEMP	39	7.35069	0.0022
UMEMP does not Granger Cause TAXREV		1.99837	0.1507

Source: Author's computation using Eviews 10

The ―pairwise Grange causality tests results in Table 4.6 show the direction of causality that runs between the variables used in this study. From Table 4.6, it is observed that a mono-directional or one-way causality runs from exchange rate to unemployment rate as the F-statistic value of 4.21863 is statistically significant as its corresponding probability value (0.0228) is less than 0.05. Thus, the null hypothesis of ―ER does not Granger cause UMEMP‖ is rejected.‖

However, from Table 4.6, ―it is observed that the direction of causality between government expenditure and unemployment rate is bi-directional. This means that a two-way causality exists between government expenditure and unemployment rate over the period of the study. This also implies that GEXP Granger causes UMEMP and UMEMP also Granger causes GEXP. This is so because, the two F-statistics values for the two null hypotheses (GEXP does not Granger cause UMEMP and UMEMP does not Granger Cause GEXP) are statistically significant as their corresponding probability values (0.0099 and 0.0087) are all less than 0.05.‖

Also, from the pairwise Grange causality tests results in Table 4.6 ―it is observed that a mono-directional or one-way causality runs from government transfer payments to unemployment rate as the F-statistic value of 3.89688 is statistically

significant as its corresponding probability value (0.0297) is less than 0.05. Thus, the null hypothesis of ―GTRF does not Granger cause UMEMP‖ is rejected.‖ Lastly, ―from the pairwise Grange causality tests results in Table 4.6, it is also observed that a mono-directional or one-way causality runs from tax revenue to unemployment rate as the F-statistic value of 7.35069 is statistically significant as its corresponding probability value (0.0022) is less than 0.05. Thus, the null hypothesis of ―TAXREV does not Granger cause UMEMP‖ is also rejected.‖

Test for Structural Break in the VECM

The test for structural break in the model is very important since the data or series for the study span several years with several changes in government and administrations, which come with changes in economic policy and programmes, which may affect the efficacy of estimates from the model. Thus, the cumulative sum of squared (CUSUM Squared) was conducted on the model to see if there are any structural breaks. The result is presented in the figure below.

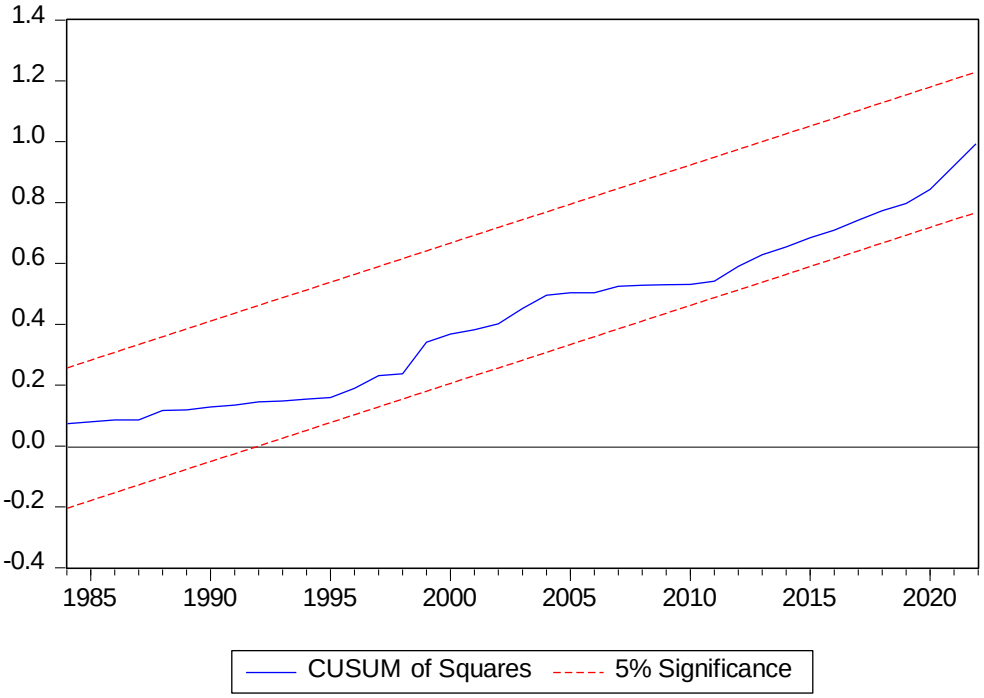

Figure 3.1: Cumulative sum of squared (CUSUM Squared) Plot

Table 4.7: VECM Normality test

VEC Residual Normality Tests
Orthogonalization: Cholesky (Lutkepohl)
Null Hypothesis: Residuals are multivariate normal
Included observations: 39

Component	Jarque-Bera	df	Prob.
1	59.18939	2	0.0000
2	1.177894	2	0.5549
3	0.077544	2	0.9620
4	1.443743	2	0.4858

5	0.022799	2	0.9887
6	2.618226	2	0.2701
7	48.30515	2	0.0000
8	1.826592	2	0.4012
Joint	114.6613	16	0.1285

*Approximate p-values do not account for coefficient Estimation

Source: Author's Computation Using Eviews 10

The Cholesky VECM normality test result in table 4.7 shows whether the residuals of the estimated Vector Error Correction Model in Table 4.4 above are normally distributed or not. One criterion for validating the efficiency and forecasting power of a model is that the residuals of that model are normally distributed. Thus, from Table 4.7, Jarque-Bera statistic value for the joint components of the model (0.1285), which is greater than 0.05 in a good indication that the residuals of the estimated VECM are normally distributed. Therefore, the null hypothesis, ―the residuals are multivariate normal‖ is accepted.

Table 4.8: VEC Autocorrelation Test result

VEC Residual Serial Correlation LM Tests
Included observations: 40

Null hypothesis: No serial correlation at lag h

Lag	LRE* stat	df	Prob.	Rao F-stat	df	Prob.
1	63.62643	64	0.4897	0.974308	(64, 93.0)	0.5393
2	63.85439	64	0.4816	0.978775	(64, 93.0)	0.5314

Null hypothesis: No serial correlation at lags 1 to h

Lag	LRE* stat	df	Prob.	Rao F-stat	df	Prob.
1	63.62643	64	0.4897	0.974308	(64, 93.0)	0.5393
2	134.3458	128	0.3330	0.937875	(128, 63.2)	0.6255

*Edgeworth expansion corrected likelihood ratio statistic.
Source: Author's computation using Eviews 10

The VEC autocorrelation result in Table 4.8 shows that there is no serial or autocorrelation in the model estimated in this study, thereby making it fit for making policy recommendations. The absence of autocorrelation is claimed because both the _LRE statistics and Rao F-statistics' and their corresponding probability values are greater than 0.05, which is the needed condition for accepting the null hypothesis of ―No serial correlation both at lag h and lags 1 to h‖.

Conclusion and Recommendations

Based on the findings above, the study concludes that;

1. Government expenditure plays a very significant role in the determination of unemployment rate in Nigeria.
2. Government transfer payment does not significantly impact on unemployment rate in Nigeria. Which also implies that government transfer payment is not a key variable that determines Nigeria's unemployment rate.
3. There exists a statistically significant relationship between unemployment rate (UMEMP) and government tax revenue in Nigeria.
4. Finally, broad money supply is also a very significant variable in the determination of unemployment rate in Nigeria.

Therefore, the following recommendations are made:

1. Since government expenditure is identified to have a significant impact on unemployment rate, government should increase her expenditure in the productive sectors of the economy to bring down the soaring unemployment rate in the country.
2. Government's transfer payments in the form of trader moni, etc should be discouraged as it does not significantly impact unemployment rate in Nigeria.
3. Also, money supply should be increased by the monetary authorities to cushion unemployment rate in Nigeria. This, however should be done with caution so that the economy will not be plunged into a state of high inflation rates.

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