

The impact of fiscal and monetary policy on unemployment rate in Nigeria (1981-2020)

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Abstract

This study 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 Statistical Bulletin (CBN) and National Bureau of Statistics (NBS). From the findings, the coefficient of determination (R^2) is 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 confirms that the estimated model is stable. Also, the serial correlation LM test and heteroskedacity test confirm that there is no autocorrelation and heteroskedacity in the model. The findings show that government expenditure and interest rate has 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 show 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 shows 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), it is obvious that 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 concludes 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.

Keywords: fiscal policy, monetary policy, unemployment rate, VAR, Nigeria. JEL classification code: C32, E52, E63, H30, J64

Introduction

Globally, unemployment has become one of the major issues facing nations [1]. Although some degree of unemployment is inevitable in an economy with diverse sectors, when a country however keeps its labour force as fully employed as possible, it achieves a higher level of economic growth than when many of them stand idle. One of the key macroeconomic goals is the achievement of full employment. If a nation is not achieving full employment, it means that it is not fully utilising its available resources [2].

Essentially, the two key policies for achieving full employment are fiscal policy and monetary policy. Fiscal policy can be seen as the use of government collected taxes and expenditure to influence the aggregate spending in an economy which is the crucial cause of unemployment [3]. Monetary policy on the other hand is a deliber-

ate action of the monetary authorities to influence the quantity and availability of money in the circulation. The action is carried out through changing money supply and/or interest rates with the aim of managing the quantity of money in an economy [4].

In Nigeria, despite several fiscal 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 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 at 2020, unemployment rate rose to 33.7% (NBS, 2020).

Monetary policy on the other hand has experience price instability over the years. The inability of the monetary policy in curbing price instability has caused growth instability as the record of development in Nigeria [4]. Studies have shown that inefficient monetary policies associated with high and volatile inflationary tendencies distort the allocation of productive resources, eventually result to unemployment rate in the long term [5]. The rigidly controlled interest rate regime and the non-harmonization of fiscal and monetary policies may have contributed immensely to the adverse effect on the rising unemployment rate [6]. This therefore calls for the need to use the instruments of fiscal and monetary policy to address the problem of unemployment in Nigeria in order to drive the economy towards sustainable growth and development.

Several studies have been examined by researchers on the impact of fiscal and monetary policy on unemployment rate in both developed and developing countries Monacelli Holden & Sparrman, 2016. However, most studies focused on either the relationship between fiscal and unemployment or monetary policy and unemployment or between monetary policy and growth [7-12]. For instance, the works of Kelechukwu and Amadi (2016); Monacelli Holden and Sparrman (2016); Folawewo and Adeboje (2017) focused on the impact of fiscal policy on unemployment rate [12].

Furthermore, the works of Stockhammer and Sturn and Amassoma and Esther focused on the impact of monetary policy on unemployment rate. Also, the works of Nasko; Ufoeze, Odimgbe, Ezeabalisi and Alajekwu (2018) and Ayodeji and Oluwefocused on the impact of monetary policy on economic growth in Nigeria [10, 13-15]. However, the differences in their approaches call for further investigation. Hence, this study intends to fill this gap by examining holistically the impact of fiscal and monetary policy on unemployment rate in Nigeria.

The other sections of this paper are arranged as follows; Section two review theoretical and empirical literatures. The third section focuses on methodology. Section four looks at the presentation and analysis of results while the final section provides conclusion and recommendations.

Literature Review

The theoretical framework for the study is based is the Keynesian IS-LM framework. The investment-saving (IS) curve describes the combination of both income (Y) and the interest rate (r);

$$Y = C(Y - T) + I(r) + G \quad (1)$$

Equation (1) states that the quantity of goods produced, Y, must equate the quantity of goods demanded, C + I + G. Now, assuming a linear consumption function and investment function, we have;

$$Y = C + I + G \quad (2)$$

Given that the consumption function is;

$$C = a + b(Y - T) \quad (3)$$

Where $a > 0$ $b > 0$, and the investment function is;

$$I = c - dr \quad (4)$$

Where b is the marginal propensity to consume ($0 < b < 1$). The parameter d determines how much investment responds to the interest rate and the negative sign actually validate that they are inversely related. From equation (2-4) above, If we substitute the consumption and investment functions into the national income accounts identity, we obtain;

$$Y = [a + b(Y - T)] + (c - dr) + G \quad (5)$$

Notice that Y shows up on both sides of this equation. We can simplify this equation by bringing all the Y terms to the left-hand side and rearranging the terms on the right-hand side:

$$Y - bY = (a + c) + (G - bT) - dr \quad (6)$$

We solve for Y to get;

$$Y = \{[(a + c) + (G - bT) - dr] / 1 - b\} \quad (7)$$

This equation expresses tells us the level of income Y for any given interest rate r and fiscal policy G and T. Holding fiscal policy fixed, the equation tells us that the higher the interest rate, the lower the level of income and vice versa.

Conversely, the LM curve describe the combinations of income Y and the interest rate r that satisfy the money market equilibrium condition;

$$M/P = L(r; Y) \quad (8)$$

This equation simply equates money supply and money demand. We can learn more about the LM curve by considering a case where money demands function is linear;

$$L(r; Y) = eY - fr \quad (9)$$

The value of e determines how much the demand for money rises when income rises. The value of f determines how much the demand for money falls when the interest rate rises.

The equilibrium in the money market is now described by;

$$M/P = eY - fr \quad (10)$$

To see what this equation implies, rearrange the terms so that r is on the left-hand side. We obtain;

$$r = (e/f)Y - (1/f)M/P \quad (11)$$

This equation gives us the interest rate that equilibrates the money market for any values of income and real money balances. The LM curve graphs this equation for different values of Y and r given a fixed value of M/P .

Finally, to find the aggregate demand equation, we must find the level of income that satisfies both the IS equation and the LM equation. To do this, substitute the LM equation for the interest rate r into the IS equation to obtain;

$$Y = \{[(a + c/1-b) + (1/1-b)G + (-b/1-b)T + (-d/1-b)] [e/f Y - 1/f M/p]\} \quad (12)$$

Fiscal Policy and Unemployment rate: The Empirical Evidence

Various literatures have examined the effect of fiscal policy on unemployment rate. For instance, Nwosa (2014) assess the effect of government spending on unemployment and poverty rates in Nigeria using annual time series data from the period 1981 to 2011. The study employed the use of Ordinary Least Square (OLS) estimation technique. The results of the study presented a positive and significant effect of government expenditure on the unemployment rate. On the other hand, there was a negative and insignificant relationship between government expenditure and the poverty rate. Also, Amassoma & Esther (2015) analyzed the efficacy of monetary policy variables in curtailing the rate of unemployment in Nigeria using time series data from 1970 to 2013 [10]. The study utilized the Ordinary Least Squares and error correction techniques for the analysis of the data obtained from the CBN Statistical Bulletin and NBS.

It was evident from the result that exchange rate exerts significant influence on unemployment during the period under investigation. Additionally, it was found that exchange rate granger causes unemployment. Owing to the findings, the study suggested for the adoption of appropriate monetary policy stance that will help in ensuring the availability of investment-accommodating interest rate in the Nigerian economy. This was validated by the works of

Kelechukwu and Amadi which examine the relationship between fiscal policy and the unemployment rate in Nigeria using an annual time series data spanning from the period 1970 to 2013 [11]. The study employs the use of parsimonious Error Correction Model (ECM). The study revealed that there is a negative relationship government spending and the unemployment rate in Nigeria while government tax revenue positively impacted the unemployment rate. According to their study, there existed also a long-run equilibrium relationship between fiscal policy and unemployment in Nigeria. The authors suggested that the need for the government to strongly implement viable fiscal and monetary policies and diversify the country's economy to attract more foreign investors and create more job opportunities for people. In another study, Folawewo and Adebaje assess the relationship between some macroeconomics aggregates and unemployment in the Economic Community of West African States (ECOWAS) by built their analysis on Okun's Law and Philips curve theoretical frameworks. The study make use of fixed effects and random effects estimation of panel data as well as fully modified ordinary least squares (FMOL) panel data estimation technique on an annual data spanning from 1991 to 2014, they empirically examined both aggregate ECOWAS data level and a sub-regional level, that is, Francophone and Anglophone country levels [12]. The outcome of the study exposed that gross domestic product (GDP) growth has a reducing but insignificant impact on the unemployment rate, which indicates low employment elasticity of growth in the region. The study recommended the essence of an enabling macroeconomic environment that will ensure the creation of employment in the ECOWAS region.

Monetary Policy and Unemployment Rate: The Empirical Evidence

Several studies have been assessed on the impact of monetary policy on unemployment rate in Nigeria. For instance, Chicheke (2009) evaluated the effects of monetary policy on unemployment and inflation in South African economy between 1980 and 2008. The estimation technique adopted by the study is Vector Error Correction Model (VECM). The findings show that inflation is more sensitive to changes in monetary policy compared to unemployment. Therefore, the study recommended for monetary policy to be focused on achieving tolerable inflation rate which provides incentives for economic expansion and reduction of unemployment rate. Also, Stockhammer & Sturn examine the impact of monetary policy on unemployment hysteresis in 19 countries of Organization for Economic Co-operation and Development (OECD) between 1980 and 2009 [13]. The explanatory variables included in the model are monetary easing, standard labour market institution variables and terms of trade shock. The results indicate that monetary easing and terms of trade shock strongly influenced unemployment while labour market institution variables exerted weak effect on unemployment hysteresis. The study suggested that monetary policy should emphasize more on changes in real interest rate given its strong impact on unemployment via monetary easing. In another study, Amassoma & Esther analyzed the efficacy of monetary

policy variables in curtailing the rate of unemployment in Nigeria using time series data from 1970 to 2013 [10]. The study utilized the Ordinary Least Squares and error correction techniques for the analysis of the data obtained from the CBN Statistical Bulletin and NBS. It was evident from the result that exchange rate exerts significant influence on unemployment during the period under investigation. Additionally, it was found that exchange rate granger causes unemployment. Owing to the findings, the study suggested for the adoption of appropriate monetary policy stance that will help in ensuring the availability of investment-accommodating interest rate in the Nigerian economy. Furthermore, Elekwa, Aniebo & Ogu (2016) analyzed the nexus between portfolio investment and unemployment in Nigeria with the period of analysis spanning from 1980 to 2014. The focus on portfolio investment was driven by its perceived role in fostering the development of financial market. The study applied econometrics method with a focus on single equation, reduced form specification. It was found that in the long term, portfolio investment exerts significant positive impact on employment growth. This outcome is in tandem with the general view in the literature of a positive relationship between portfolio investment and economic growth. The study recommended for policy makers to improve on the investment climate so as to attract more portfolio investments for productive employment.

Methodology

Model Specification

The specification of an appropriate econometric model borders on the prevailing economic circumstance(s) and the availability of economic data relating to the variable(s) being examined (Koutsoyiannis, 1997). Based on the IS-LM framework in equation (1-12) above, we can determine the interactions between fiscal policy, monetary policy and unemployment. Thus, the VAR model specified is:

$$V_t = \beta_0 + \sum_{i=1}^k A_i V_{t-i} + u_t \quad (13)$$

Where;

V_t = (the vector of government expenditure, government tax, money supply, interest rate, unemployment rate)

β_0 = intercepts of autonomous variables

A_i = matrix of coefficients of all the variables in the model.

V_{t-i} = vector of the lagged variables.

u_t = vector of the stochastic error terms.

Hence, substituting the necessary variables into the above equation (13), the model for the study can be modified as;

$$\Delta UNEMP_t = \beta_0 + \sum_{i=1}^k \eta_i \Delta UNEMP_{t-i} + \sum_{i=1}^l \psi_i \Delta GEX_{t-i} + \sum_{i=1}^o \phi_i \Delta GTAX_{t-i} + \sum_{i=1}^n \omega_i \Delta MS_{t-i} + \sum_{i=1}^m \alpha_i \Delta INTR_{t-i} + u_{1t} \dots \dots (14a)$$

$$\Delta GEX_t = \beta_0 + \sum_{i=1}^k \eta_i \Delta GEX_{t-i} + \sum_{i=1}^l \psi_1 \Delta GTAX_{t-i} + \sum_{i=1}^o \phi_2 \Delta MS_{t-i} + \sum_{i=1}^n \omega_3 \Delta INTR_{t-i} + \sum_{i=1}^m \alpha_4 \Delta UNEMP_{t-i} + u_{2t} \dots \dots (14b)$$

$$\Delta GTAX_t = \beta_0 + \sum_{i=1}^k \eta_i \Delta GTAX_{t-i} + \sum_{i=1}^l \psi_1 \Delta MS_{t-i} + \sum_{i=1}^o \phi_2 \Delta INTR_{t-i} + \sum_{i=1}^n \omega_3 \Delta UNEMP_{t-i} + \sum_{i=1}^m \alpha_4 \Delta GEX_{t-i} + u_{3t} \dots \dots (14c)$$

$$\Delta MS_t = \beta_0 + \sum_{i=1}^k \eta_i \Delta MS_{t-i} + \sum_{i=1}^l \psi_1 \Delta INTR_{t-i} + \sum_{i=1}^o \phi_2 \Delta UNEMP_{t-i} + \sum_{i=1}^n \omega_3 \Delta GEX_{t-i} + \sum_{i=1}^m \alpha_4 \Delta GTAX_{t-i} + u_{4t} \dots \dots (14d)$$

$$\Delta INTR_t = \beta_0 + \sum_{i=1}^k \eta_i \Delta INTR_{t-i} + \sum_{i=1}^l \psi_1 \Delta UNEMP_{t-i} + \sum_{i=1}^o \phi_2 \Delta GEX_{t-i} + \sum_{i=1}^n \omega_3 \Delta GTAX_{t-i} + \sum_{i=1}^m \alpha_4 \Delta MS_{t-i} + u_{5t} \dots \dots (14e)$$

Where;

UNEMP = unemployment rate

GEX = total government expenditure

GTAX = government tax

MS = money supply

INTR = interest rate

U_t = stochastic error term

β_0 = constant term

$\eta_i, \psi_i, \phi_i, \omega_i, \alpha_i$ = coefficients of the variables

u_t = error term

Data and Sources

The study used time series secondary data on five key macroeconomic variables, namely, unemployment rate, total government expenditure government tax, money supply and interest rate. Total government expenditure and government tax were use as proxies for fiscal policy while money supply and interest rate serve as proxies for monetary policy. The data were sourced from the Central Bank of Nigeria (CBN) statistical bulletin and the data spans between the periods 1981 to 2020.

Estimation Techniques

This study employed Vector Autoregressive (VAR) model in the investigation of the inter-relationship among the fiscal policy, monetary policy and unemployment rate in Nigeria. The Use of the VAR technique has become attractive since the Nobel Laureate, Christopher Sims (1986), demonstrated that VectorAutoregression (VAR) models are particularly powerful tools for investigating theinter-relationships among non-stationary time-series variables

Empirical Analysis

Unit Root Test

and forobtaining reliable forecasts. VARs have indeed made it possible forresearchers to address both the relative importance and the dynamic effects ofvarious shocks on macroeconomic variables. However, the VAR model has difficulties in identifying the inter-relationships between the time series data variables which contain a unit root as issues of spurious correlation may occur. However, the study adopted Augmented Dickey Fuller (ADF) test for unit root in order to attain stationary. The study also employed the use of Johansen co-integration test so as to ascertain the long run relationship between variables employed for this study.

Furthermore, the structural stability is also examined using variance decomposition and the impulse response functions. The forecast error variance decomposition indicates the percentage of unexpected changes in a variable that is linked to its own innovations as well as the shocks originating from other variables in the structural system. The Impulse response reveals the dynamic responses/reactions of a variable to an innovation due to another variable over the estimation period.

Table 1: Augmented Dickey Fuller Test at level and First Difference

Variables	ADF Test Statistics	95% ADF Critical	Order Of Integration	Remarks
UNEMP	0.24046	-2.93899	I(0)	Non-Stationary
GEX	0.407775	-2.94343	I(0)	Non-Stationary
GTAX	2.013486	-2.93899	I(0)	Non-Stationary
MS	6.854997	-2.93899	I(0)	Non-Stationary
INTR	-2.073461	-2.93899	I(0)	Non-Stationary
Variables	ADF Test Statistics	95% ADF Critical	Order Of Integration	Remarks
D(UNEMP)	-5.063760	-2.94115	I(1)	Stationary*
D(GEX)	-4.677564	-2.94343	I(1)	Stationary*
D(GTAX)	-5.638008	-3.61559	I(1)	Stationary*
D(MS)	-4.583810	-2.94343	I(1)	Stationary*
D(INTR)	-6.528727	-2.94343	I(1)	Stationary*

Source: Authors' Computations using Eviews 10.0, 2021.

Table 1 above depicts the results of unit root test for Augmented Dickey Fuller Test. It shows that in the process of comparing the test statistic value against the Mackinnon critical value at 5% level of significance, it was noticed that D(UNEMP), D(GEX), D(G-

TAX), D(MS) and D(INTR) were all stationary at first differenced. Thus, having tested for unit root, we proceed to test for the co integration result in table 2A and 2B below;

Cointegration Test Result

Table 2A: Johansen Cointegration Test Results (Trace value)

Hypothesized		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.795670	131.5737	69.81889	0.0000
At most 1 *	0.624898	71.22900	47.85613	0.0001
At most 2 *	0.441273	33.96784	29.79707	0.0156
At most 3	0.262589	11.84823	15.49471	0.1644
At most 4	0.007160	0.273071	3.841466	0.6013

Table 2B: Johansen Cointegration Test Results (Max-Eigen value)

Hypothesized		Max-Eigen	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.795670	60.34470	33.87687	0.0000
At most 1 *	0.624898	37.26116	27.58434	0.0021
At most 2 *	0.441273	22.11960	21.13162	0.0362
At most 3	0.262589	11.57516	14.26460	0.1276
At most 4	0.007160	0.273071	3.841466	0.6013

Source: Authors' Computations using Eviews 10.0, 2021.

Table 2A and 2B above depicts the results of Johansen Co integration test. It shows the estimated result of the long run relationship between the variables that is D(UNEMP), D(GEX), D(GTAX), D(MS) and D(INTR) using the Johansen co integration test. It was observed that the trace statistic in table 2A indicated 3 co-integrating equations at the 5% level of significance since the trace values are greater than critical values. Similarly, the maximum Eigen value statistic in table 2B also indicates 3 co-integrating equation at the 5% level of significance. These results suggest that there is

co-integration or long-run relationship among the variables employed in this study.

Vector Autoregressive (VAR) Model Estimate

Though there is a presence of cointegration, it was necessary to estimate the VAR model in order to assess the interrelationship between fiscal policy, monetary policy and unemployment rate in Nigeria. Thus, VAR was in Table 3 below.

Table 3: VAR Model Estimate

	UNEMP	GEX	GTAX	MS	INTR
UNEMP(-1)	0.243621	-17.9681	-5.84238	52.74889	0.028504
	(0.15506)	(13.1562)	(10.4435)	(38.6372)	(0.10586)
	[1.57117]	[-1.36575]	[-0.55943]	[1.36524]	[0.26926]
UNEMP(-2)	0.396745	37.43541	-11.7947	4.173785	0.128704
	(0.15168)	(12.8692)	(10.2157)	(37.7945)	(0.10355)
	[2.61575]	[2.90891]	[-1.15457]	[0.11043]	[1.24291]
GEX(-1)	-0.00375	-0.11455	0.237430	-0.08981	-0.00053
	(0.00197)	(0.16741)	(0.13289)	(0.49166)	(0.00135)
	[-1.90038]	[-0.68425]	[1.78663]	[-0.18267]	[-0.39099]
GEX(-2)	-0.00601	0.100546	0.502675	-0.69694	0.000728
	(0.00205)	(0.17404)	(0.13816)	(0.51113)	(0.00140)
	[-2.92817]	[0.57771]	[3.63844]	[-1.36351]	[0.52005]
GTAX(-1)	0.000144	-0.10609	-0.2777	1.484104	-0.00049
	(0.00259)	(0.22003)	(0.17466)	(0.64620)	(0.00177)
	[0.05537]	[-0.48213]	[-1.58988]	[2.29666]	[-0.27417]

GTAX(-2)	-0.00086	-0.25335	-0.06054	1.254739	-3.99E-05
	(0.00265)	(0.22497)	(0.17859)	(0.66071)	(0.00181)
	[-0.32468]	[-1.12612]	[-0.33898]	[1.89909]	[-0.02204]
MS(-1)	0.003316	0.095961	0.008652	0.459514	-0.00046
	(0.00082)	(0.06948)	(0.05516)	(0.20406)	(0.00056)
	[4.04967]	[1.38108]	[0.15686]	[2.25190]	[-0.82603]
MS(-2)	-0.00117	0.095315	0.016524	0.262852	0.000571
	(0.00084)	(0.07098)	(0.05634)	(0.20845)	(0.00057)
	[-1.39834]	[1.34288]	[0.29327]	[1.26099]	[1.00061]
INTR(-1)	0.025103	5.463325	14.06072	-3.00575	-0.13683
	(0.24770)	(21.0167)	(16.6832)	(61.7220)	(0.16911)
	[0.10135]	[0.25995]	[0.84281]	[-0.04870]	[-0.80909]
INTR(-2)	-0.94294	-12.9094	7.725824	-33.2738	-0.44374
	(0.24935)	(21.1568)	(16.7944)	(62.1334)	(0.17024)
	[-3.78157]	[-0.61018]	[0.46002]	[-0.53552]	[-2.60663]
C	0.716578	62.48183	13.76628	117.6310	0.145206
	(0.56969)	(48.3368)	(38.3700)	(141.956)	(0.38894)
	[1.25784]	[1.29264]	[0.35878]	[0.82865]	[0.37334]
R-squared	0.652123	0.541926	0.468247	0.672114	0.290088
Adj. R-squared	0.602168	0.372268	0.271301	0.550675	0.027157
Sum sq. resids	172.7138	1243378.	783487.7	10723939	80.50202
S.E. equation	2.529191	214.5950	170.3469	630.2245	1.726718
F-statistic	4.445180	3.194238	2.377541	5.534572	1.103286
Log likelihood	-82.6866	-251.439	-242.664	-292.377	-68.1829
Akaike AIC	4.930874	13.81258	13.35075	15.96723	4.167521
Schwarz SC	5.404912	14.28662	13.82479	16.44127	4.641559
Mean dependent	0.886842	157.1947	103.6519	744.6848	0.184137
S.D. dependent	3.514693	270.8524	199.5538	940.1886	1.750653
Source: Authors' Computations using Eviews 10.0, 2021.					

Table 3 above shows the Vector Autoregressive (VAR) results, the coefficient of determination (R²) is 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 it shows that about 60 percent growth in Unemployment rate can be explained by the independent variables. Finally, the F-stat is 4.445 shows that the overall test is significant. The findings show that the coefficient of government expenditure has negative and significant effect on unemployment rate at lag period 2. This shows that a unit increase in government expenditure will result

to about 0.01 unit decrease in unemployment. The coefficient of government tax was found to be negative and insignificant at lag period 2. The coefficient of money supply was found to have a positive and significant effect at lag period 1. This shows that a unit increase in money supply will result to about 0.01-unit increase in unemployment. The coefficient of interest rate has a negative and significant effect on unemployment at lag period 2. By implication, the findings show that government expenditure, money supply and interest rate are major determinants of unemployment rate in Nigeria since they were found to be statistically significant.

VAR Stability Test

Table 4: AR Root Table

Root	Modulus
0.131582	0.131582
0.998332 - 0.231926i	0.024918
0.998332 + 0.231926i	0.024918
-0.675582	0.675582
0.658222	0.658222
0.127153 - 0.449112i	0.466765
0.127153 + 0.449112i	0.466765
-0.249787	0.249787
0.085927 - 0.046771i	0.097831
0.085927 + 0.046771i	0.097831

Source: Authors' Computations using Eviews 10.0, 2021.

Table 4 shows the results of the AR root test required for this study. From the results, it is obvious that all the roots has modulus less than one and lie inside the unit circle. Hence, the estimated VAR is said to be stable.

VAR Residual Tests

Table 5: VAR Autocorrelation LM test

Lags	LM-Stat	Prob
1	16.98430	0.4207
2	12.35655	0.6611

Source: Authors' Computations using Eviews 10.0, 2021.

Table 5 shows the VAR serial correlation LM test. Based on the findings, the probability of the LM test for both lag one and two is 16.984 and this is greater than 0.05 at 5% significance level and therefore the null hypothesis is accepted. This implies and therefore confirms the absence of serial correlation.

Table 6: VAR Residual Heteroskedasticity Test

Chi-sq	df	Prob.
0.8577	300	0.1270

Source: Authors' Computations using Eviews 10.0, 2021.

Table 6 present the VAR Residual Heteroskedasticity Tests, the probability of chi-square (5) is 0.1270 and this is greater than 0.05 at 5% significant level and therefore the null hypothesis is accepted. This implies and therefore confirms the absence of heteroskedasticity in the model.

Structural Stability Analysis: Variance Decomposition

Table 7: Forecast Error Variance Decomposition

Variance Decomposition of UNEM:

Period	S.E.	UNEMP	GEX	GTAX	MS	INTR
1	2.529191	100	0	0	0	0
2	3.289251	59.21287	2.390617	9.808002	28.57335	0.015161
3	4.341036	44.73491	7.901395	13.15371	21.24003	12.96995
4	5.029111	33.47173	7.240452	24.17427	25.27988	9.833673
5	5.134577	32.18186	8.149811	25.93731	24.26657	9.464451
6	5.180262	31.78729	8.07135	26.81481	23.91796	9.408591

7	5.22299	31.58904	8.792452	26.49548	23.8268	9.29622
8	5.27409	31.38216	9.214165	26.36226	23.71954	9.321873
9	5.307234	31.00963	9.445149	26.65623	23.59506	9.29392
10	5.313461	30.93772	9.526925	26.68509	23.54607	9.304189

Source: Authors' Computations using Eviews 10.0, 2021.

The forecast error variance decomposition shows the proportion of forecast error variance in a variable that is explained by innovations in itself and the other variables can be measured by variance decomposition. The technique breaks down the variance of the forecast error for every variance following a shock to a given variable and in this way determines variables that bear the strong effect of the shocks.

Table 7 shows that variation in all the variables resulted from their own shocks. The forecast error variance decomposition of unemployment rate in Nigeria by own innovations accounts for 100% in the first year while independent variables accounts for about 0.000% respectively. Unemployment rate in Nigeria accounts for

about 32.18% of own shocks in the fifth year while government expenditure, government tax, money supply and interest rate accounts for 8.15%, 25.94%, 24.27% and 9.46% in the same year correspondingly. This indicates that, the shocks of all the variables had only marginal effect on unemployment rate in Nigerian that year. Also, about 30.93% of own shocks in the tenth year while government expenditure, government tax, money supply and interest rate accounts for 9.53%, 26.69%, 23.54% and 9.30% in the same year correspondingly. In addition, it is obvious that 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.

Structural Stability Analysis: Impulse Response Function

Table 8: Impulse Response Function

Period	UNEMP	GEX	GTAX	MS	INTR
1	2.52919	43.5365	6.49916	-107.35	-0.0075
2	0.09764	-61.464	-7.2789	89.8396	0.09661
3	1.42259	102.484	-21.179	1.2614	0.28294
4	0.18853	-26.752	-3.4846	88.6444	-0.0659
5	0.13687	73.5861	31.5811	-53.037	0.12298
6	-0.2139	-4.1062	-5.3323	63.2913	0.04229
7	-0.2953	9.06325	36.4355	-18.994	-0.0513
8	-0.3345	-3.2837	-4.9717	39.6154	-0.028
9	-0.0716	-9.9609	7.62779	28.4414	-0.0408
10	-0.0144	-3.331	-1.3585	27.6282	-0.0182

Source: Authors' Computations using Eviews 10.0, 2021.

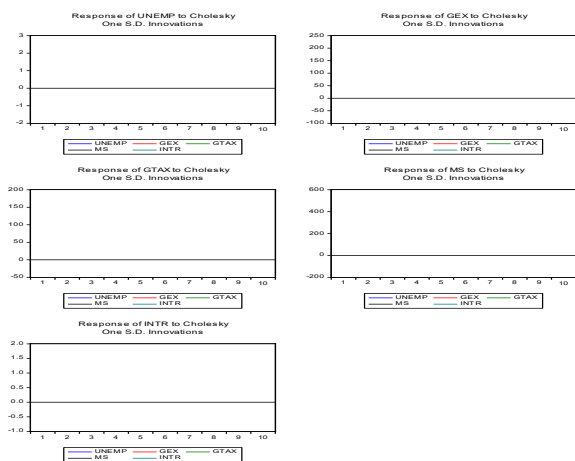


Table 8 above shows the findings from the impulse response function unemployment in Nigeria as against its own shocks and the shocks of government expenditure, government tax, money supply and interest rate over a tenth year projection. The Impulse response was estimated to quantify the responsiveness of variables to structural changes in the system. The time length will facilitate the inclusion of both the short-run, medium-run and long-run responses of unemployment rate in Nigeria to other variables employed in this study. The result of the impulse response function of unemployment shows that unemployment rate that has a negative relationship with its past values from periods except in the first, 2nd, 3rd, 4th and 5th periods. The impulse responses of government expenditure, government tax, money supply and interest rate are also observed and depicted in the above graph (Figure 1).

Figure 1: Impulse Response Function

Conclusion and Recommendation

This study 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. From the findings, the results show that government expenditure and interest rate has 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 show 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 shows 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), it is obvious that 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 recommends 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.

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