

Examining the Effects of Fiscal-Monetary Policy Interactions on Unemployment Rates in Nigeria (1985-2023)

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ABSTRACT

Despite the abundance of natural resources in Nigeria, the problem of unemployment is still intractable; and thus, has made Nigeria to be ranked among the nations with the highest rate of unemployment in sub-Saharan Africa. This study therefore seeks to assess how effective a mix of monetary and fiscal policy is at addressing the scourge of unemployment in Nigeria over time. The IS-LM framework formed the theoretical basis of this study. This study used secondary data collected from various sources for a period of 39 years, from 1985-2023. For the analysis, the Auto-regressive Distributed Lag (ARDL) method was used alongside the Bounds test approach and other post estimation tests. The study estimated both the short-run and long-run effects of the interactive economic variables on unemployment in Nigeria. The study found that monetary policy instruments alone have significant and positive relationships on employment, while the fiscal policy variables were not significant in both short-run and long-run. However, the study also revealed that in Nigeria, the interaction of some of these two policies are significant and depict a negative relationship with the rate of unemployment, while others were not significant which could be as a result of a poor implementation structure in the Nigerian context. The study recommends that before the economy implements an effective policy mix, there should be a proper review to these policies to ensure that one is not more dominant than the other, as this study revealed. Interest rates should be such that would encourage investment, productivity and job creation. Also, the government should ensure that the effects of their expenditure is seen with respect to employment generation and provision of amenities for economic progress.

Keywords: Unemployment Rate, Fiscal Policy, Monetary Policy, ARDL approach.

JEL Classification: E24, E62, E52, C5

INTRODUCTION

The operational structure of both monetary and fiscal policies is essential for fine-tuning the progress of any economy across the globe. Broadly speaking, the purpose of any macroeconomic policy is to attain a high level of national income, ensure economic growth, achieve stable prices, maintain a healthy balance of payments, as well as engender full employment levels. It is impossible to overstate the role played by the interaction of fiscal and monetary policy in coordinating economic policies in a developing economy like Nigeria to address the problems posed by various economic fluctuations like poverty, inflation, unemployment and inequality (Adenaike, 2022).

Over the years, the importance of monetary policy in influencing macroeconomic factors such as unemployment has become more prominent. Economic postulations before the 1930s, commonly referred to as classical economics were dominated by the opinion that money has no effect on the real variables of the economy. Hence, money is not significant, according to the classical school. The Keynesians on the other hand, debunked this view and argued vehemently that money has an effect on the real sector of the economy operating through interest rates. The rise of this school of thought gave impetus to the formulation of fiscal policies. Fiscal policy as a tool of macroeconomic policies also plays an essential role in the reduction of unemployment in an economy. Both monetary and fiscal policies play a key role in the promotion of the main government objective of promoting the citizens' welfare (Ogah et al. 2021).

Despite the abundance of natural resources in Nigeria, the problem of unemployment is still intractable; and thus, has made Nigeria to be ranked among the nations with the highest rate of unemployment in sub-Saharan Africa. The unemployment rate in Nigeria increased from 4.3 percent in 1970 to 6.4 percent in 1980 (World Development Indicator, 2020). According to Akintoye (2008), the high unemployment rate in the 1980s was commonly linked to the late 1970s economic slump in Nigeria. Moreover, Nigeria's unemployment rate escalated to 14.2 percent in the fourth quarter of 2016, up from 13.9 percent in the third quarter of 2016 and 13.3 percent in the second quarter of the same year (NBS, 2017). Currently, the unemployment rate is estimated to be 33.3 percent in the fourth quarter of 2020, which is projected to rise in 2022. (NBS, 2021).

According to Amusa et al. (2019), It has been argued that pursuing comprehensive fiscal and monetary policies together with good governance has the ability to engender a strong desire for double-digit growth rate in the Nigerian economy.

Many studies have tried to examine the impact of either monetary or fiscal policy on unemployment in Nigeria. However, this study would focus on the introduction of interactive terms which capture the effects which using both policies would have on the rate of unemployment in the Nigerian economy. In addition to that, this study uses Auto-regressive Distributed Lag (ARDL). The study adds to the body of knowledge by focusing on these identified gaps stated.

The overall aim of this research is to see how effective a mix of monetary and fiscal policy is at addressing the problem of unemployment in Nigeria from 1985 to 2023.

Specific objectives include:

- a. To examine the effect of monetary policy variables alone on unemployment rate in Nigeria.
- b. To examine the effect of fiscal policy variables alone on unemployment rate in Nigeria.
- c. To examine the effect of trade, foreign direct investment and gross domestic product on unemployment rate in Nigeria.

The study focuses on the fiscal and monetary policy instruments that helps reduce the rate of unemployment in Nigeria. The study covers a period of 39 years, from 1985-2023. The reason for the choice of the base year is attributed to the introduction of the Structural Adjustment Programme which was solely responsible for the adjustment of the country's economic structure, stimulating economic growth and reducing inflation. So, this study examines the trend of unemployment and investigates if this programme, alongside other programmes, have been able to solve this problem.

This study is significant as it explores how coordinating both fiscal and monetary policies can properly ameliorate unemployment in Nigeria. This study is also important to the government for policy formulation and implementation

The rest of this study examines the Literature Review, Methodology, Results and Conclusions.

LITERATURE REVIEW

2.1 The interactions of fiscal and monetary policy

The monetary and fiscal policy activities are carried out by two different institutions. The fiscal policy operations are solely performed by the government of any country while the monetary policy operations are solely performed by the central bank, which is the apex bank in Nigeria. These two policies are pivotal in any economy. A change in one will influence the effectiveness of the other and thereby the overall impact of any policy change. Tensions can arise between what each will do to help smooth economic cycles and achieve macroeconomic stability and growth. This policy mix is a key component of the International Monetary Fund's (IMF's) macroeconomic policy advice and of IMF-supported economic adjustment programs, together with external, structural, and financial sector policies

Fiscal policy is one component of government policy concerned with the use of taxation, public expenditure,

and other financial programs included in the annual budget and deciding how best to use the gathered revenue to achieve national goals (Anyafor, 2016). Nigeria's fiscal policy is heavily reliant on oil export revenues. With oil and gas accounting for most of Nigeria's export revenues, oil price volatility has a significant impact on government revenue and expenditure (Baunsgaard, 2003).

The evolution of monetary policy in Nigeria can be divided into two phases according to the Central Bank of Nigeria. They include; The era of direct controls (1959-1986) and the era of market-based controls (1986-date). The era of direct controls was a defining moment in Nigerian monetary policy, as it coincided with several structural changes in the economy, including the shift in the nation's economic base from agriculture to petroleum, the execution of the civil war, and the oil boom and glut of the 1970s and early 1980s, respectively.

Nigeria has a history of using both fiscal and monetary policies to manage economic fluctuations. The interaction of these two policies brings about stability in the economy thereby resulting in low unemployment rates in the country. When the economy is at its lowest, a good policy combination would bring about growth in the economy. Furthermore, to ensure that an economy experiences growth and low unemployment rate, there is need for proper monetary and fiscal policy coordination by the policy analyst.

Although governments and central banks have different goals and time horizons, they may work together to stimulate (or cool) economic growth.

2.2 Conceptual Review

Fiscal policy is important in stimulating and stabilizing a depressed economy since it plays a substantial role in resource utilization, poverty reduction, and inflation management, among other things. According to Anyafor (2016), fiscal policy is one component of government policy concerned with the use of taxation, public expenditure, and other financial programs included in the annual budget and deciding how best to use the gathered revenue to achieve national goals. The goal of modern fiscal policy is to increase economic efficiency and stability.

Adigwe, Echefkoba, and Justus (2015) opined that monetary policy is a major economic stabilization tool that serves as measures to regulate and control the volume, cost, availability, and direction of money and credit in an economy to achieve certain macroeconomic goals.

In Nigeria, the Central Bank uses the monetary policy rate (MPR) which signifies the direction of interest rates as a nominal anchor, to conduct monetary policy. In any economy, monetary policy has the crucial function of regulating the money supply by targeting inflation or reaching full employment.

The unemployment rate measures the percentage of the working-age population who are unemployed but looking for work. The labour force consists of both employed and idle individuals. The unemployment rate accurately depicts the extent to which persons who are ready to work are able to find and actively work. Unemployed people are those who are currently out of work but are willing and capable to work and have actively searched for work. Currently, the unemployment rate is estimated to be 33.3 percent, which is projected to rise in 2022 (NBS, 2021). It is projected to rise further in 2022. Unemployment is regarded as the root of poverty in Nigeria according to (Akinmulegun, 2014).

According to the Keynesian Theory, unemployment is as a result of a reduction in government spending in an economy and that significant government intervention is required to meet employment and output targets. Keynesian unemployment is caused by downturns in the economy that are part of the business cycle, which are the natural fluctuations in the economy (Amu, Osabuohien & Alege, 2021).

2.3 Empirical Review

Bulk of existing literature on these policies focuses on the impact of either monetary or fiscal policy in reducing unemployment. For instance, Johnson, Olanipekun and Saka (2021) looked at the relationship between fiscal policy, unemployment, and trade in West Africa from 1991 to 2018. The study adopted pooled least squares which corrected for the problem of data inadequacy experienced in some West African countries. Results showed

that government spending and tax revenue underperformed expectations and, in some circumstances, contradicted expectations. As a result, a significant increase in government spending on infrastructure development in West Africa would help to reduce unemployment.

Emmanuel (2021) studied the impact of fiscal and monetary policies in controlling unemployment in Nigeria, from 1981 to 2020. He employed the Vector Autoregressive (VAR) mode as the main statistical tool for analysis. The results indicate that government spending and interest rates have a negative and significant effect on the unemployment rate at the second lag period. At lag period 2, the government tax was discovered to be negative and insignificant. At lag period 1, the money supply was shown to have a positive and significant effect. The findings imply that government spending, money supply, and interest rate are major factors of Nigeria's unemployment rate because they were determined to be statistically significant.

Maku and Alimi (2018) investigated the impact of fiscal policy instruments in generating employment in Nigeria. The study covered the period 1980 to 2015. The study employed the use of Augmented Dickey-Fuller Test, Engle-granger Cointegration test and Ordinary Least Square method to carry out econometric analysis. Results revealed that government spending has a negative relationship with unemployment. However, tax revenue and output from the agricultural sector have a positive relationship with unemployment. The study therefore recommends that government spending on relevant capital projects can support job development and connect rural and urban centers, rather than driving migration.

Ozigbu (2021) studied the link between monetary policy transmission mechanism and rate of unemployment in Nigeria. The study utilized the Stock-Watson dynamic least squares method and Granger causality test to perform econometric analysis. Economic variables used in the study were money supply, real interest rate, credit to the private sector and cash reserve ratio. Results revealed that broad money supply is directly related to unemployment rate. Also, credit to the private sector reveals a negative and significant effect on the unemployment rate in Nigeria. It was recommended that the monetary policy committee and other players in the Nigerian financial system prioritize increases in private sector funding and monetary aggregates.

Obayori (2016) examined the impact of fiscal policy on unemployment rate in Nigeria. The study covered a period of 34 years, spanning from 1980 to 2013. He employed co-integration test and Error Correction Model to test if both government capital and recurrent expenditure have a significant and long-run relationship with unemployment. The results showed that both government capital and recurrent expenditure have a negative and significant relationship with unemployment. It was further reported that fiscal policy is effective in controlling the rate of unemployment in Nigeria. The study recommends operation of expansionary fiscal policy and advocates for appropriate policy mix improvement.

Other studies that looked at the impact of monetary policy on unemployment include Sunday, et al., (2016), Stockhammer and Sturn (2011), Manuel and Jasmine (2016), amongst others. Studies like Kelechukwu and Amadi (2016); Monacelli Holden and Sparrman (2016); Folawewo and Adeboje (2017), looked at the fiscal policy impact on unemployment in Nigeria. These studies, however, failed to look at the interactive effects of both policies on unemployment.

A few studies have tried to examine the impact of the interaction of these two policies. However, not particularly on unemployment in Nigeria. Adedoyin, et al. (2018) examined the interaction of these two policies on the stock market. This study did not analyze the interaction of both policies on unemployment. Goshit, G.G and Landi, J. H (2014) employed a theoretical technique to discuss the interactions of the monetary and fiscal policy in Nigeria. This was not backed with empirical analysis. This study, therefore, will add to the existing body of literature by critically examining the interactive impact of fiscal and monetary policy particularly on unemployment in Nigeria. Furthermore, this study will employ the use of Auto-regressive Distributed Lag (ARDL).

DATA AND METHODOLOGY

3.1. The IS-LM Model

This study is anchored on the IS-LM model which was developed by a British economist, John Hicks, in 1936.

It was based on the Keynesian theory, established by J.M. Keynes, who believed that unemployment can be combated through the appropriate use of fiscal and monetary policy tools.

According to the Keynesian theory, unemployment is caused by downturns in the economy that are part of the business cycle, which are the natural fluctuations in the economy (Amu, Osabuohien & Alege, 2021).

The IS-LM framework studies the interaction between fiscal and monetary policy as well as its impact on unemployment in an economy. It involves understanding how these two policies affect the equilibrium in both the goods market and money market, which consequently affects the levels of employment in the economy. The model explicitly captures the interaction between fiscal and monetary policies, which is crucial for understanding how combined policy actions affect macroeconomic variables like output and unemployment.

The IS in the model represents Investment-Savings. This depicts the equilibrium in the goods market, where total spending (Consumption, investment, government and net exports) equals total output and an increase in the level of output gives rise to an increase in employment levels in the economy.

The equation is given as: $Y = C(Y - T) + I + G + (NX)$

Where;

Y: National income/output

C: Consumption, which is a function of disposable income $(Y - T)$

T: Taxes

I: Investment, which is a function of the interest rate r

G: Government spending

NX: Net exports, given as $(X - M)$

The LM in the model represents Liquidity Preference-Money Supply. This depicts the equilibrium in the money market, where money demand equals money supply.

The equation is given as: $M/P = L(r, Y)$.

Where;

M: Money supply

P: Price level

L: Liquidity preference (demand for money), which is a function of interest rate, r and income, Y .

The IS Curve and Employment:

Fiscal Policy: When the government increases spending (G) or decreases taxes (T), the IS curve shifts to the right. This leads to an increase in aggregate demand, higher output (Y), and consequently higher employment, therefore reducing unemployment.

The LM Curve and Employment:

Monetary Policy: When the central bank increases the money supply (M), the LM curve shifts to the right, reducing interest rates (r). Lower interest rates reduce the cost of borrowing, stimulate investment (I) and consumption (C), and increase aggregate demand (AD). This leads to higher output (Y) and lower unemployment.

The IS-LM model can be adapted to consider specific structural issues in developing economies like Nigeria, such as dependence on exports, outputs and foreign investments, as captured in this study.

3.2. Research Methodology

The study utilized ex-post facto research design. It employed the use of annual data sourced from the Central Bank of Nigeria Statistical Bulletin, National Bureau of Statistics and the International Labour Organization. The Autoregressive Distributed Lag (ARDL) estimation technique was used to empirically analyze the effect of monetary-fiscal policies on unemployment. In specifying the model, emphasis is laid on the effect of policy coordination on unemployment in Nigeria. This study is based on the fundamental philosophy of positivism, which requires empirical facts to prove results. Variables under consideration are Unemployment Rate (UNR), Government Capital Expenditure (GCE), External Debt (EXD) (both as proxy for fiscal policy stance), Interest Rate (IR), Credit to Private Sector (CPS) (both as proxy for monetary policy stance), Gross Domestic Product Growth Rate (GDPGR), Foreign Direct Investment (FDI) and Trade (TR), which represent the control variables.

Table 1: Definition of variables

Variables	Definition of variables	Data source
UNR	Unemployment Rate from 1985 to 2023	National Bureau of Statistics (NBS)
IR	Interest Rate: a proxy for monetary policy	Central Bank of Nigeria (CBN) Statistical Bulletin
GDPGR	Gross Domestic Product Growth Rate	World Development Indicators (WDI)
TR	Trade (% GDP)	World Development Indicators (WDI)
EXT	External Debt	Debt Management Office (DMO), International Monetary Fund (IMF).
CPS	Credit to Private Sector	Central Bank of Nigeria Statistical Bulletin
GCE	Government Capital Expenditure	Central Bank of Nigeria Statistical Bulletin
FDI	Foreign Direct Investment	Central Bank of Nigeria Statistical Bulletin

Source: Author’s compilation (2024)

3.3. Model Specification

This model examines the impact of monetary and fiscal policies on the rate of unemployment in Nigeria, The theoretical basis for the model is primarily Keynesian. in controlling unemployment in Nigeria. Following the Keynesian model, unemployment can be reduces through the use of monetary and fiscal policies. Thus, the model is expressed in structural form as:

$$UNR = f(F, M, C) \dots \dots \dots (1)$$

Where UNR is the unemployment rate

F is the vector of Fiscal Policy variables

M is the vector of monetary policy variables, and

C is the vector of monetary policy variables

In explicit form, equation (1) can be stated as expressed in (2) or (3), that is in linear or non-linear form:

$$UNR = \beta_0 + \beta_{1t}F + \beta_{2t}M + \beta_{3t}(F * M) + \beta_{4t}C + \epsilon \dots \dots \dots (2)$$

The non-linear form of the model is:

$$UNR = \alpha_0 F_t^{\alpha_1} M_t^{\alpha_2} (F * M)_t^{\alpha_3} C_t^{\alpha_4} e^{u_t} \dots \dots \dots (3)$$

Where u_t denotes the error term. α_i (for $i = 1,2,3,4$) represent the coefficients and α_0 is the constant term.

Log-linearization of equation (3) yields the following expression:

$$LnUNR = Ln\beta_0 + \beta_{1t}LnF + \beta_{2t}LnM + \beta_{3t}Ln(F * M) + \beta_{4t}LnC + u_t \dots \dots \dots (4)$$

The F, M and C variables used in this model are as follows:

F is the vector of Fiscal Policy variables, captured by Government Capital Expenditure (GCE) and External Debt (EXT).

M is the vector of Monetary policy variables, captured by Interest rate (IR) and Credit to Private Sector (CPS).

C is the vector of Control variables, captured by GDP Growth Rate (GDPGR), Foreign Direct Investment (FDI) and Trade Openness (TR).

For the purpose of this study, the linear model expressed in equation 2, without the interactive term, is further expressed as;

$$UNR = \beta_0 + \beta_{1t}IR + \beta_{2t}CPS + \beta_{3t}GCE + \beta_{4t}EXT + \beta_{5t}GDPGR + \beta_{6t}FDI + \beta_{7t}TR + \epsilon \dots \dots \dots (5)$$

β_0 is the constant term (that is, the intercept) of the estimated regression line.

$\beta_{1t} \dots \dots \beta_{7t}$ are the coefficients of the independent variables influencing the dependent variable (unemployment rate).

This model will also employ the introduction of an interactive term. The use of this multiplicative term was introduced by Fleming & Nellis (2000). An interaction term is effectively a multiplication of the two features that you believe have a joint effect on the target.

In the works of William, R. C. and Golder, M. (2023), an interactive model was specified. According to them, all the constitutive elements of a multiplicative interactive term must be included in the model when specified. This is to avoid any omitted variable bias.

Introducing the interactive variable will be the multiplication of the selected fiscal and monetary policy.

Adapting the work of Agu, O. C. et al. (2021), their model was stated as;

$$GDPGR_t = \beta_0 + \beta_1(INTR * LNGXP)_t + \beta_2 INTR_t + \beta_3 LNINV_t + \beta_4 LNGXP_t + \beta_5 LNCAP_t + \mu_t \dots \dots \dots (6)$$

Hence, for this study, our equation 5 is re-estimated with the inclusion of the interactive term, expressed as:

$$UNR = \beta_0 + \beta_{1t}IR + \beta_{2t}CPS + \beta_{3t}GCE + \beta_{4t}EXT + \beta_{5t}(IR * GCE) + \beta_{6t}(IR * EXT) + \beta_{7t}(CPS * GCE) + \beta_{8t}(CPS * EXT) + \beta_{9t}GDPGR + \beta_{10t}FDI + \beta_{11t}TR + \epsilon \dots \dots \dots (7)$$

Where; $IR_t * GCE_t$, $IR_t * EXT_t$, $CPS_t * GCE_t$ and $CPS_t * EXT_t$ represents the interactive impact of each of the

policy instruments.

3.4. Unit root test

A unit root in a time series is a stochastic trend. The unit root is employed to test for stationarity in a time series data, in order to avoid spurious regression. A time series' distribution is stationary if a change in time has no effect on it. The Augmented Dickey Fuller Test is used to test for unit root in this study

3.5. Autoregressive Distributed Lag (ARDL) model

Pesaran et al. (2001) developed a model that introduced a co-integration technique called the autoregressive distribution lag (ARDL) bound approach. The Autoregressive Distributive Lag (ARDL) is used in identifying the long-term relationship between series with different integration orders. This informed our choice of using the ARDL estimation techniques. Several merits of using this approach is that it allows the variables to have different optimal lags which is almost impossible with other co-integration techniques. Also, the ARDL model is suited for small sample size. In this case, using the ARDL technique to co-integration provides reasonable and efficient estimates.

The ARDL specification of the empirical model in eq. (7) is expressed as:

$$\Delta UNR_t = a_{01} + \delta_1 UNR_{t-1} + \delta_2 IR_{t-1} + \delta_3 GCE_{t-1} + \delta_4 EXT_{t-1} + \delta_5 CPS_{t-1} + \delta_6 GDPGR_{t-1} + \delta_7 FDI_{t-1} + \delta_8 TR_{t-1} + \delta_9 (IR * GCE)_{t-1} + \delta_{10} (IR * EXT)_{t-1} + \delta_{11} (CPS * GCE)_{t-1} + \delta_{12} (CPS * EXT)_{t-1} + \sum_{i=1}^p a_{1i} \Delta UNR_{t-i} + \sum_{i=0}^q a_{2i} \Delta IR_{t-i} + \sum_{i=0}^q a_{3i} \Delta GCE_{t-i} + \sum_{i=0}^q a_{4i} \Delta CPS_{t-i} + \sum_{i=0}^q a_{5i} \Delta EXT_{t-i} + \sum_{i=0}^q a_{6i} \Delta GDPGR_{t-i} + \sum_{i=0}^q a_{7i} \Delta FDI_{t-i} + \sum_{i=0}^q a_{8i} \Delta TR_{t-i} + \sum_{i=0}^q a_{9i} \Delta (IR * GCE)_{t-i} + \sum_{i=0}^q a_{10i} \Delta (IR * EXT)_{t-i} + \sum_{i=0}^q a_{11i} \Delta (CPS * GCE)_{t-i} + \sum_{i=0}^q a_{12i} \Delta (CPS * EXT)_{t-i} + e_{it}$$

.... (8)

Where UNR_t is a vector, \mathbf{p} and \mathbf{q} are the optimal lags orders; e_{it} is the vector of the error term. \mathbf{p} lags: used for the dependent variable \mathbf{q} lags: used for the exogenous variables.

EMPIRICAL FINDINGS AND DISCUSSIONS

The descriptive statistics include mean, median, maximum, least, standard deviation, skewness, kurtosis and the jarque-bera test. Running a descriptive statistic is important because it gives the researcher an idea of the distribution of the data that is being used.

Table 2: Descriptive statistics

	UNR	IR	GCE	CPS	EXT	GDPGR	FDI	TR
Mean	13.58	15.40	2.89	9.97	36.01	4.19	1.33	28.26
Median	12.70	14.00	2.40	8.46	25.65	4.20	1.16	28.18
Maximum	37.00	26.00	9.08	19.63	120.84	15.33	4.28	42.93
Minimum	1.80	10.00	0.64	4.96	4.95	-2.04	-0.04	8.73
Std. Dev.	9.43	3.30	1.89	3.63	30.42	3.76	0.94	9.41
Skewness	0.57	0.80	1.16	0.75	0.83	0.51	0.83	-0.28
Kurtosis	2.44	3.96	4.23	3.01	3.03	3.59	3.75	2.00
Jarque-Bera	2.62	5.63	11.14	3.67	4.51	2.21	5.44	2.14
Probability	0.27	0.06	0.00	0.16	0.10	0.33	0.07	0.34

Sum	529.60	600.70	112.53	388.74	1404.25	163.40	51.82	1102.27
Sum Sq. Dev.	3381.84	414.43	135.41	500.80	35158.30	538.33	33.35	3361.84
Observations	39.00	39.00	39.00	39.00	39.00	39.00	39.00	39.00

Source: Author’s computation (2024)

Table 2 above shows the descriptive statistics of the various series. The mean and median values are within its maximum and minimum values which depicts a good level of consistency. The results of the skewness of all the variables except GCE mirror a normal distribution as their values tend to zero. Also, the value of their respective kurtosis are not too far from 3, which also shows that they are nearly mesokurtic. Also, The p-value of the jarque-bera statistics of these variables are greater than the significant value of 0.05. Hence, we cannot reject the null hypothesis of a normal distribution. So, we can say that they have a normal distribution. However, for GCE, the p-value of the jarque-bera statistics is statistically significant, so, the null hypothesis is rejected and we can conclude that GCE does not have a normal distribution.

Table 3: Correlation matrix

	UNR	IR	GCE	CPS	EXT	GDPGR	FDI	TR
UNR	1.00							
IR	-0.02	1.00						
GCE	-0.69	0.32	1.00					
CPS	0.69	0.02	-0.55	1.00				
EXT	-0.75	0.28	0.67	-0.71	1.00			
GDPGR	0.09	0.13	-0.13	0.06	-0.29	1.00		
FDI	-0.11	0.46	0.03	0.05	0.11	0.22	1.00	
TR	0.13	0.42	-0.04	0.08	-0.16	0.44	0.63	1.00
IREXT	-0.64	0.53	0.62	-0.60	0.93	-0.26	0.22	-0.03
IRGCE	-0.58	0.57	0.95	-0.45	0.64	-0.11	0.15	0.09
CPSGCE	-0.40	0.39	0.82	-0.02	0.33	-0.04	0.16	0.10
CPSEXT	-0.63	0.30	0.63	-0.56	0.95	-0.33	0.09	-0.16

	IREXT	IRGCE	CPSGCE	CPSEXT
UNR				
IR				
GCE				
CPS				
EXT				
GDPGR				
FDI				

TR				
IREXT	1.00			
IRGCE	0.69	1.00		
CPSGCE	0.34	0.83	1.00	
CPSEXT	0.90	0.62	0.40	1.00

Source: Author’s compilation (2024)

Table 3 above shows the degree of relationship among the variables of interest. The result reveals the series of positive and negative correlations. The correlation result above shows that the variables themselves are not highly correlated with one another, thereby depicting an absence of the problem of multicollinearity.

Table 4: Unit Root test

Series	Series at Level			Series at First Difference			Order of Integration
	ADF Statistics	Critical Value at 5%	Remark	ADF Statistics	Critical Value at 5%	Remark	
UNR	-0.295	-2.943	Non-Stationary	-7.399	-2.943	Stationary	I(1)
IR	-4.002	-3.533	Stationary	-6.099	-3.540	Stationary	I(0)
GCE	-1.205	-2.943	Non-Stationary	-9.711	-2.943	Stationary	I(1)
CPS	-2.091	-2.943	Non-Stationary	-5.733	-2.948	Stationary	I(1)
EXT	-1.163	-2.941	Non-Stationary	-5.979	-2.943	Stationary	I(1)
GDPGR	-2.314	-2.943	Non-Stationary	-11.245	-2.943	Stationary	I(1)
TR	-3.136	-2.943	Stationary	-5.825	-2.943	Stationary	I(0)
FDI	-3.977	-2.941	Stationary	-9.534	-2.943	Stationary	I(0)
IR*GCE	-2.652	-2.941	Non-Stationary	-8.666	-2.943	Stationary	I(1)
IR*EXT	-2.497	-2.941	Non-Stationary	-8.293	-2.943	Stationary	I(1)
CPS*GCE	-3.219	-2.941	Stationary	-9.134	-2.943	Stationary	I(0)
CPS*EXT	-1.343	-2.946	Non-Stationary	-5.117	-2.946	Stationary	I(1)

Source: Author’s compilation (2024)

This study employed the use of time series data, which is often non-stationary and often leads to spurious regression. Therefore, after performing the unit root test, result revealed that the values of the ADF test statistics for IR, TR, FDI and (CPS*GCE) were in absolute terms higher than the critical values at 5% when testing for stationarity at level. This indicates that these series are stationary at level. For the other variables, the ADF test statistics was lower than the critical value at 5 percent when testing for stationarity at level. This means that the variables are not stationary at level. However, after taking the first difference, they became stationary as the ADF test statistics were greater than the critical value at 5 percent.

The result of this unit root test gave us a mixed order of I(0) and I(1) variables. This makes the ARDL model more applicable for this study.

Table 5: Lag selection Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-1440.760	NA	2.61e+18	76.461	76.978	76.645
1	-1232.257	274.3459*	1.24e+17*	73.066*	79.788*	75.458*

* indicates lag order selected by the criterion

LR: sequential modified LR test statistic (each test at 5% level)

FPE: Final prediction error

AIC: Akaike information criterion

SC: Schwarz information criterion

HQ: Hannan-Quinn information criterion

Before the ARDL test, it is necessary to carry out the lag selection criteria. This is because the ARDL test is sensitive to the order of lag. The table 5 above represents the maximum lag length selection criteria. Lag 1 was selected and the Akaike Information Criteria (AIC) was chosen, because it has the lowest value compared to other criteria.

Table 6: Bounds Co-integration Test

Dependent Variable: Unemployment Rate (UNR)				
F-Bounds Test	Null Hypothesis: No Long-run Relationship			
Test Statistic	Value	Significance Level	Critical Values	
F-statistic	2.542425		I(0)	I(1)
K	11	10%	1.83	2.94
		5%	2.06	3.24
		2.5%	2.28	3.5
		1%	2.54	3.86

Source: Author's compilation (2024) E views 12

From the bounds test above, the F-statistics is greater than the critical value of the lower bound at 5percent, but not greater than the upper bound at 5 percent. So, the bounds test above shows us that the result is inconclusive. Hence, we cannot conclude if there is a long-run equilibrium relationship. Therefore, we cannot reject the null hypothesis since the result is inconclusive. We therefore proceed to estimate both the short-run and long-run test.

Table 7: Short-run ARDL result of the impact of Fiscal and Monetary Variables on Unemployment (without interaction)

Short-run ARDL				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(IR)	0.696	0.613	1.135	0.271
D(CPS)	2.291	0.996	2.300	0.034

D(GCE)	7.247	4.848	1.495	0.152
D(EXT)	0.035	0.227	0.154	0.880
D(GDPGR)	-0.297	0.282	-1.052	0.307
D(FDI)	0.408	1.427	0.286	0.778
D(TR)	0.085	0.129	0.659	0.518
Coint Eq (-1)	-0.679	0.185	-3.670	0.002

Source: Author’s compilation (2024) E views 12

Evaluating the short-run regression, the result revealed that Credit to Private Sector (CPS) was significantly related to the rate of unemployment in Nigeria. Result revealed that, with a 1 percent increase in credit to the private sector, unemployment increases by 2 percent. CPS is expected to have a negative relationship with unemployment rate, but this is not the case in Nigeria. The implication of this result is that oftentimes, an expansionary monetary policy might not have immediate effect on the overall economy and so, it takes a while before adjusting to the expansion. However, the result revealed that, in the short-run, all other policy variables are not significant.

Furthermore, the result of the correction term is significant and falls between -1 and 0, which makes it acceptable. The correction term indicates the speed of adjustment of the model from the long-run to the short-run within a period. The result above shows that within a year, it takes about 68 percent of the economy to adjust back to the short-run from the long-run equilibrium. That is, if there is disequilibrium in the short run, it takes about 68 percent percent to adapt back from the short run into the long run.

Table 8: Long-run ARDL result of the impact of Fiscal and Monetary Variables on Unemployment (without interaction)

Long Run Coefficients				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
IR	3.623	1.308	2.769	0.013
CPS	0.769	1.516	0.507	0.618
GCE	2.724	7.238	0.376	0.711
EXT	0.051	0.338	0.152	0.881
GDPGR	-1.170	0.602	-1.944	0.068
FDI	0.601	2.118	0.284	0.780
TR	0.125	0.188	0.667	0.514
C	-38.744	25.680	-1.509	0.149

Source: Author’s compilation (2024) E views 12

The long-run results as shown above reflects that Interest Rate and GDP Growth Rate are both significant at 10 percent and also conforms with a priori expectation. An increase in IR by 1 percent, will lead to an increase in the rate of unemployment to about 4 percent. This conforms to the study of Agu, O. C., Okoli, B. C., & Olaosebikan, O. (2021) that an increase in interest rate will discourage borrowing and investment, which could in turn lead to an increase in unemployment. Also, there is a negative relationship between the GDP growth rate and the rate of unemployment. This means that for any 1 percent increase in the Gross Domestic Product (GDP),

unemployment is said to reduce by 1.1 percent. However, the other control variables proved insignificant in curbing unemployment in Nigeria. This could be as a result of the lack of a big market for Nigeria commodities. There is also over-dependence on importation of commodities in Nigeria, which reduces our trade openness and makes its effect on unemployment insignificant. Also, for foreign direct Investment (FDI), due to the fluctuating depreciation in value of the Naira, foreign investors are discouraged and therefore the FDI seems insignificant as we do not have much foreign reserves due to fluctuating exchange rate.

The Result of the interactive nature of monetary and fiscal policies in Nigeria

This study investigated the interactive impact of monetary and fiscal policies on the economic growth of Nigeria. Recall that the interactive variables are (CPS*EXT), (CPS*GCE), (IR*EXT) and (IR*GCE) which evaluated the joint impact of monetary and fiscal policy on the unemployment rate in Nigeria.

Table 8: Long-run and short-run ARDL result of the impact of Fiscal and Monetary Variables on Unemployment

Short-run ARDL			Long Run Coefficients		
Variable	Coefficient	Prob.	Variable	Coefficient	Prob.
D(IR)	0.696	0.271	IR	3.623	0.013
D(CPS)	2.291	0.034	CPS	0.769	0.618
D(GCE)	7.247	0.152	GCE	2.724	0.711
D(EXT)	0.035	0.88	EXT	0.051	0.881
D(CPS*EXT)	0.053	0.04	CPS*EXT	0.099	0.014
D(CPS*GCE)	-0.978	0.029	CPS*GCE	-0.658	0.299
D(IR*EXT)	-0.019	0.058	IR*EXT	-0.057	0.023
D(IR*GCE)	0.032	0.848	IR*GCE	0.047	0.848
D(GDPGR)	-0.297	0.307	GDPGR	-1.17	0.068
D(FDI)	0.408	0.778	FDI	0.601	0.78
D(TR)	0.085	0.518	TR	0.125	0.514
Coint Eq (-1)	-0.679	0.002	C	-38.744	0.149

Source: Author’s compilation (2024) E views 12

The results above revealed that in both short-run and long-run, the interactive variable (IR*EXT) and (CPS*EXT) are both significant at 10 percent, while the interactive variable of (CPS*GCE) is only significant in the short-run. GDPGR is only significant in the long-run and not in the short-run. For the interactive term of interest rate and external debt (IR*EXT), the result reveals that both in the short-run and the long-run, there is an inverse relationship between the interactive variable and unemployment rate in Nigeria. This means that, with any increase in interest rate and external borrowing, it is expected that the external borrowing would be used positively to create more opportunities and other social amenities as well as good working conditions for the masses. This will in turn reduce the rate of unemployment in the country. Also, for the interaction of credit to private sector and Government capital expenditure (CPS*GCE), result in the short-run revealed an inverse and significant impact on unemployment. This means that any 1 percent increase in both capital expenditure and credit to private sector properly coordinated, will bring about the reduction in the rate of unemployment in Nigeria, but this is only in the short-run. Furthermore, the interaction of credit to the private sector and external debt (CPS*EXT) brings about a direct and significant impact of unemployment rate in Nigeria. So, for any increase in these two policy variables, unemployment is seen to also increase. This could be as a result of a

poorly coordinated macroeconomic environment, as such is the case in Nigeria. On the other hand, monetary policy could either be helpful or could be counteractive to fiscal policies, due to the existing political and economic reflections.

Diagnostic tests

Diagnostic tests were conducted on the model to determine its reliability and to ensure that they are free from wrong assumptions. Three tests were carried out and they are: Heteroskedasticity test, Serial correlation test and Normality test.

Table 9: Diagnostic Tests Results

	Probability	Conclusion
Heteroskedasticity Test: ARCH	0.6353	Heteroskedasticity does not exist in the model
Serial Correlation LM Test	0.8158	Auto-correlation does not exist in the model
Normality Test	0.028	Not all series for the model are normally distributed

RAMSEY-RESET TEST RESULT

	Value	df	Probability
t-statistic	1.094358	17	0.2891
F-statistic	1.197620	(1, 17)	0.2891

The RAMSEY-RESET test shows that the model is correctly specified. The probability of the F-statistic is greater than 0.05, which shows that there is no specification error in the model.

CONCLUSIONS AND RECOMMENDATIONS

This study examined the impact of fiscal and monetary policy interaction on unemployment in Nigeria. The study employed the use of ARDL estimation technique to analyze the series from 1985 to 2023. Data was sourced from various sites, such as, Central Bank Statistical Bulletin and National Bureau of Statistics (NBS), Debt Management Office (DMO) and World Development Indicators (WDI). By conducting the bounds test, the result revealed that it was inconclusive and that the existence of a long-run equilibrium relationship among the variables and unemployment cannot be concluded. Therefore, the ARDL short-run and long-run models were further estimated. From the ARDL long-run estimation, the result revealed that interest rate alone is a significant tool of the monetary authority. An increase in interest rate depicts a contractionary monetary policy, and so, if interest rate is increased, it becomes more expensive for individuals to borrow, it discourages investment, which in turn leads to a decrease in productivity and output, thereby leading to a decrease in the rate of employment. This means that the government should ensure that interest rates are kept at a favourable level to enhance investment, thereby improving the level of economic growth and also reducing unemployment in the country. Also, the rate of growth of the nation's GDP is also significant. An increase in the output and production in the economy will bring about a reduction in the rate of unemployment in the country. From the result, It can also be deduced from the long-run result that, with the interaction of credit to the private sector and external debt, there is a significant improvement in the rate of unemployment in the economy. Therefore, when there is an appropriate mix of credit or loans to businesses, coupled with government's borrowing, there would be a significant reduction in the rate on unemployment and this happens only when the funds borrowed by the government is used to finance the economy, in terms of increase in provision of employment opportunities,

trainings and so on.. It can also be deduced from the result, that compelling short run relationships exist between unemployment and the interaction between fiscal and monetary policies. Like the interaction of private sector credit and government capital expenditure, private sector credit and external debt, interest rate and external debt. The only interactive variable that was found to be insignificant, both in the short-run and long-run was the interaction of interest rate and government capital expenditure.

It can be deduced from this study that credit to private sector and interest rate, on their own, are significant tools to reduce the rate of unemployment in the country. However, the fiscal policy variables, taken alone were not found to be significant. We can attribute this to a number of reasons, such as poor governance, widespread corruption, embezzlement of public funds, lack of fund management in the country amongst others. Also, government capital expenditure should be utilized in a way that it is not just seen on paper, but also has a positive effect on the economy, through the provision of infrastructure and social amenities and also the creation of jobs.

It is recommended that before the economy implements any policy mix, there should be a proper review to these policies to ensure that one is not more dominant than the other. Also, looking at the control variables, only the growth in Gross Domestic Product was found to be significant and negatively related to unemployment in Nigeria. Other control variables such as, Trade openness and foreign direct investment were found to be insignificant and even positively related to unemployment rate in Nigeria. This calls for a review in the value of the Naira, to help it regain its lost value, so as to attract foreign investors and more capital into the country's economy. When this happens, the economy experiences growth and development, thereby leading to increase in employment opportunities in the country. The economy should also be more open to diversification and not just relying on the export of one resource. Nigeria is given more to importation than exportation. The domestic market should be given the needed attention, in order for it to grow. With this, exportation increases and then more production would lead to more employment opportunities.

Further studies may also include the interaction of other fiscal and monetary policy instruments, not just limited to government expenditure and interest rates. Also, variables like exchange rate volatility, innovation and technological progress may be captured, as all these are macroeconomic variables that influence the state of the economy.

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