

## **AN EMPIRICAL ANALYSIS OF THE BUDGET DEFICIT AND UNEMPLOYMENT NEXUS IN NIGERIA**

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### **Abstract**

In the face of persistent budget deficit and the Keynesian school of thoughts continual reiteration of the potentiality of fiscal policies to effectively increase employment opportunities towards full employment, effectuate price stability and stimulate economic growth and development, many researches have sought to provide empirical evidences of the aftermath of budget deficit in Nigeria. This study sought to contribute to the existing literature and provide financial analysts with more insights on the behavioral pattern of related macro-economic variables by documenting some of the robust findings on the dynamic effects of variation in government annual deficit on unemployment in Nigeria. This study employs a quantitative analysis using the ex-post factor research design. The data for the study spans 21 years (1997 - 2017). Secondary data was collected from the Central Bank of Nigeria Statistical Bulletin (2017) and publications of the National Bureau of Statistics while econometric method based on linear regression and Vector Error Correction Mechanisms (VECM) were adopted in estimating the parameters of the model. Furthermore, diagnostic checks are also performed to test for heteroskedacity and serial correlation. The findings revealed that Government Annual Deficit has a significant positive effect on the Unemployment Rate in Nigeria. Taking into cognizance of the sign of the absolute value of budget deficit used in the regression analysis, this signifies that increase in budget deficit decreases the unemployment rate in Nigeria. This claim is in congruence with the keynesian view of the result of government intervention via fiscal policies. Therefore the study recommends that deficit spending should be targeted towards effective and productive expenditures which will result to Gross Domestic Product (GDP) growth rate that is higher than the interest rate culminating into a fall in the ratio of debt to GDP over time.

**Keywords:** Budget Deficit, Keynesian School, Unemployment, Linear Regression

## 1.0 INTRODUCTION

Fiscal policy is the utilization of government expenditure, taxation and transfer payments to control and regulate the economy. Examples of fiscal tools typically employed are budgeting, taxation, public expenditure, public debt and public works. Budgeting and budget practices is considered as the bellwether amongst these fiscal tools and has demonstrated great potency to influence economies towards a predetermined government direction and the achievement of macroeconomic objectives (Organisation for Economic Co-operation and Development, 2001). According to Ndam (2009), a budget is a detailed financial statement that shows details of anticipated revenue and proposed expenditure. The fiscal potential of a budget is embodied in its ability to carry out an expansionary or a contractionary function in the economy, usually achieved by the deployment of a budget deficit or a budget surplus respectively. According to Obadan (2004), budget deficit occurs when the expected government expenditure outweighs the anticipated government revenue within a fiscal year, that is, a budget deficit arises whenever government expenditure exceeds revenue collection. Similarly, Audu and Apere (2013) opined that budget deficit is operationally the negative difference between budget revenue and budget expenditure.

Most developing economies have continued to adopt the argument of the Keynesian economists that the means of boosting an economy depends largely on the intervention of government by deploying fiscal tools targeted at influencing aggregate demand in an economy (Olomola & Olagunju, 2004). The effect on aggregate demand is expected to ultimately result in increased output and employment accompanied by price stability. In Nigeria, successive governments have employed the use to budget deficit to serve as a catalyst to build up the economy of the nation (Bakare, Adesanya & Bolarinwa, 2014). The trend analysis of Nigeria's budget history shown below demonstrates the existence of a persistent budget deficit in Nigeria since 1981 excluding 1994 and 1995 when there was budget surplus.

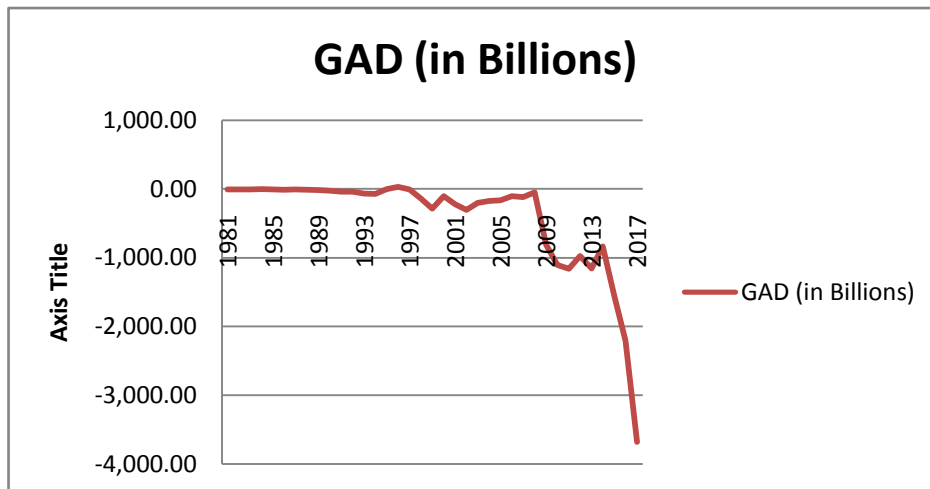


Figure 2: **Nigeria's Government Annual Deficit from 1981 to 2017**

Source: CBN Statistical Bulletin 2018

In the face of persistent budget deficit and the Keynesian school of thoughts continual reiteration of the potentiality of fiscal policies to effectively increase employment opportunities towards full employment, effectuate price stability and stimulate economic growth and development, many researches have sought to provide empirical evidences of the aftermath of budget deficit in Nigeria. Furthermore, the need to excogitate the fiscal role of budget deficit is heightened by the refutation of the keynesian's claim by the neoclassical theory and the ricardian theory proponents. Ricardian theory posits the neutrality of fiscal policies while the neoclassical theory argues that rather than having a positive effect, fiscal policies affect the economy adversely. Additionally, the provision of contradictory empirical evidences across countries on the effect of fiscal policies further accentuate the need for sustained evaluation of the aftermath of budget deficit in developed and developing economies. Moreover, the paucity of studies on the effect of budget deficit on unemployment especially in emerging economies provides compelling evidence on the need to examine the linkage between theory and empirical substantiation of the relationship between the two variables. Thus, the study sought to contribute to the existing literature and provide financial analysts with more insights on the behavioral pattern of related macro-economic variables by documenting some of the robust findings on the dynamic effects of variation in government annual deficit on unemployment in Nigeria. Furthermore, the reported empirical evidence will be helpful in current policy discussions.

The next section describes the conceptual, empirical and theoretical framework. Section three presents the research methodology, econometric framework and reports results from regression analysis model simulation, while the fourth section compares the findings to previous empirical evidences and theoretical models. The last section provides conclusion, policy simulation based on the empirical responses from the regression and then recommendations for further studies.

## **2.1 Conceptual Review**

Unemployment, a major constitute of the “vicious circle that explains the endemic nature of poverty in developing economies” remains a pivotal concern in the socio-economic life of every country (Aminu & Anono, 2012). It is the situation that arises when an individual seeking for a paid employment is unable to obtain one (Kwanga, 2015). The International Labour Organization (ILO) explains the unemployed as quantity of the economically active population seeking for employment but who are jobless, as well as those who have been laid off and those who have resigned from their employment of their own accord. Unemployment describes the condition when proficient and willing individuals are without appropriate remunerated occupation (Udu & Agu, 2005 cited in Asaju, Arome & Anyio, 2014). It is the reality of a number of people not having a job; the condition of being jobless (Hornby, 2010). Asaju, Arome and Anyio further elaborated that unemployment occurs when people who are able and willing to work are without jobs, or cannot find work that is effective and productive to do. It also occurs when people undertake jobs that are contrary or lower than their academic qualifications or areas of specialization. The various types of unemployment are structural, cyclical, frictional, classical, Seasonal, Transitional and Hidden Unemployment (Kemi & Dayo, 2014 cited in Eze & Nwambeke, 2015).

Eze and Nwambeke (2015) explained that structural unemployment occurs when employed people are laid off and replaced by machines due to globalization and technology advancement while cyclical unemployment occurs when the aggregate demand of the economy is not sufficient to provide the types of jobs everybody wants to do. The study also described frictional unemployment as unemployment that occurs when the skills of the work force are mismatched with the underlying jobs and classical unemployment as unemployment that occurs when the

government set the salary wage rate above the equilibrium prices that causes unemployed persons to rush for the job in the labour market which exceeds the number of people needed for the job. Udu and Agu (2005) observed that a critical examination of the various types of unemployment shows that unemployment can be voluntary or involuntary. Voluntary unemployment is attributed to individual's decision which includes workers who reject low wage jobs, while involuntary unemployment is as a result of adverse change in socio-economic variables (such as the market structure, government policies, etc.) which permeate the environment in which one operates. Involuntary unemployment includes workers made redundant because of an economic crisis, decline in industrial activities, company restructuring or liquidation. From the foregoing, it can be deduced that structural and classical unemployment are basically involuntary and that most cases of unemployment in Nigeria are involuntary.

Given the pervasive trend of unemployment globally, many researches have investigated the enabling circumstances. Most of this studies observed that income instability, inadequate economic growth and poverty induced unemployment (Mahmood, Ali, Akhtar, Iqbal, Qamar, Nazir, Abbas & Sana, 2014). Specifically in Nigeria, Asaju, Arowe and Anyio (2014) and Aiyedogbon and Ohwofasa (2012) found out that Corruption, poor management practice, neglect of agricultural sector, infrastructural decay, lack of purposeful leadership and good governance, unfavourable government reforms, unfavourable terms and conditions of employments, systemic problems in education, poor economic growth rate, premature implementation of economic policies, erroneous misconception concerning technical and vocational education and poor enabling environment were blamable for the prevailing unemployment situation.

Policies on unemployment issues are vital to the socio-economic life of every country as unemployment is a staid hitch to social progress. Unemployment does not only represent an enormous waste of a country's human capital resources, it results to the reduction in income and well-being which subsequently leads to decreased standard of living (Aminu & Anono, 2012). Asaju, Arowe and Anyio (2014) and Hassan (2010) also observed that unemployment triggers pervasive delinquency, thuggery, armed robbery, sex exploitation, kidnapping upsurge of civil and political disorder. These consequences of the rising and sustained trend in unemployment in

Nigeria extend beyond the unemployed to the society at large and continue to threaten the survival of Nigeria (Bello, 2003; Aminu & Anono). To obviate such virulent effects of unemployment in Nigeria, creation of employment has remained a prevailing discourse to the economists, financial analyst and policy makers (Aiyedogbon & Ohwofasa, 2012; Kareem, 2015).

The total population in Nigeria is divided into labour force (currently active) and non-labor force (not currently active). The labour force population covers all persons aged 15 to 64 years who are willing and able to work regardless of whether they have a job or not. The definition of unemployment therefore covers persons (aged 15–64) who during the reference period were currently available for work, actively seeking for work but were without work. The non-labor force includes population below 15 or older than 64 as well as those within the economically active population i.e. 15- 64, who are unable to work, not actively seeking for work or choose not to work and/or are not available for work. The Nigerian National Bureau of Statistics (NBS), like most countries in the world, uses a variant of the ILO definition such that the unemployment is the proportion of those in the labour force (not in the entire economic active population, nor the entire Nigerian population) who were actively looking for work but could not find work for at least 20 hours during the reference period to the total currently active (labour force) population. Accordingly, you are unemployed if you did absolutely nothing at all or did something but for less than 20 hours during the reference week. Hence, the unemployment rate is calculated by dividing the labor force population by labour force population.

Unemployment Rate =  $100 \times \frac{\text{unemployed population}}{\text{Total labour force}}$

The diagram below shows the trend of Nigeria's unemployment rate:

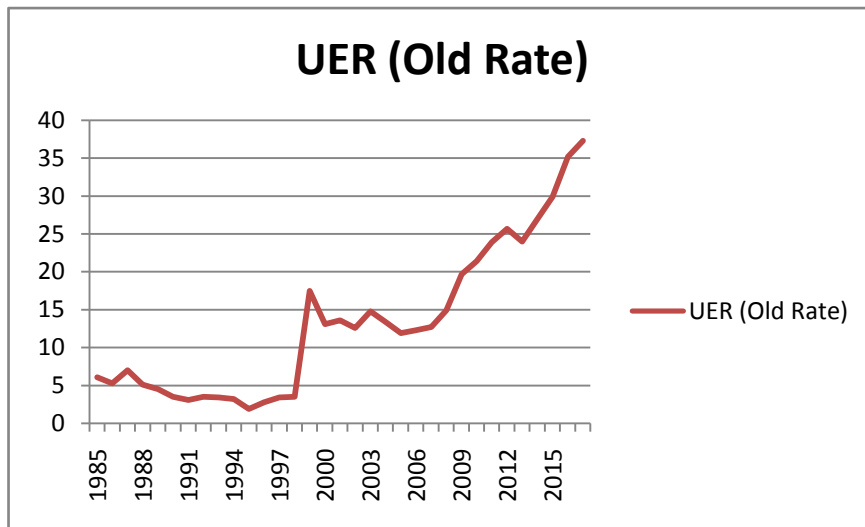


Figure 2: **Nigeria's Unemployment Rate from 1985 to 2017**

The graph provides supporting evidence of increase in unemployment rate overtime. In the face of obvious evidence of increasing unemployment, the question surrounding the aftermath of the continued use of budget deficit in Nigeria, given the Keynesians claim that expansionary fiscal tools such as budget deficit have the potential to create employment opportunities consequently reducing unemployment rate, still remains.

Goher, Mehboob and Wali, (2012) stated that budget deficit results in situations where the expenditures of the country exceed its revenues, earned from the taxes and other sources. It arises when a government outlays exceed revenue for that fiscal year (Etim-Ikang, 2013). Havrilesky (1985) and Osuka and Achinihu (2014) observed that the protagonists of fiscal deficits postulated that budget deficit functions as an expansionary fiscal policy instrument used to boost economic development as it induces increase in aggregate demand and stimulates the economy. In Nigeria, various authors identified insufficient tax revenue, increase in infrastructural needs, corruption, fiscal indiscipline, mismanagement of available resources and public enterprises, ineffective co-ordination and implementation of public projects, insecurity, inconsistency in government policies establishment, duplication of government ministries, departments and agencies and steady rise in debt service payments as factors that contribute to budget deficit (Uduakobong, 2014; Osuka & Achinihu, 2014; Bakare, Adesanya & Bolarinwa,

2014). Budget deficit can either be financed by debt financing (borrowing money from either the domestic money market or from foreign sources) or by money creation (a process of monetizing the deficit whereby Central Bank buys the bonds issued by governments) (Okpanachi, 2004; Uduakobong). Using either means is expected to increase money supply that will serve as a catalyst to set off a multiplier and undulating effect by creating a platform for increased economic activities will boost growth and development.

## **2.2 Empirical Review**

Pressman (1995) contended the view that fiscal policy was incapable of solving the unemployment problem premised on the argument that government deficits crowded out consumer spending, business investment and net exports. He called attention to existing theoretical and empirical supports of the positive effect of fiscal policy on employment rate which many nations have failed to take advantage of to curb the rising rate of unemployment.

Bargawi and McKinley (2011) critically analysed the severity of Tory-inspired public belt tightening on US economy with a view of predicting the effect of deficit reduction on economic recovery in UK and Southern Europe. The study used the 'State of the World Economy' global macroeconomic model to compare two basic scenarios and observed that the outcome of reduction in budget deficits would largely be counter-productive as it would negatively affect the growth of GDP, private investment and employment. This opinion is shared by Battaglini and Coate (2011), who explored the interaction between fiscal policy and unemployment and posited that any rise in unemployment can be mitigated by tax cuts and public spending increases.

Madueme and Nwosu (2011) showed that deficit had a positive effect on unemployment rate in Nigeria. The effect was however statistically insignificant. Tagkalakis (2013) investigated the unemployment effects of fiscal policy changes in Greece from 2000 to 2012 using the Blanchard and Perotti (2002) SVAR methodology and found evidence that unemployment reduced when there was an increase in government purchases, government consumption, the government wage bill and government investment and increased when there is a cut in government purchases and its subcomponents. The study also discovered that tax hikes increased unemployment. The analysis in summary posited that spending containment increased unemployment hence alluding



that government expansionary fiscal policies reduced unemployment. However, Laokulrach (2013) studied the effect of fiscal policies on service sector employment in Thailand using multiple regression analysis and found out that fiscal policy had no significant relationship with employment rate.

Mahmood et al. (2014) investigated the causes of unemployment in Pakistan. They discovered that budget deficit significantly increased unemployment. The study had employed variance inflation factor analysis and Stepwise regression. Kato and Miyamoto (2015) studied the effects of fiscal stimuli on the labor market in Japan using a structural VAR model, same methodology employed by Tagkalakis (2013). Their results were similar to his conclusion as they found out that fiscal expansion increased output, private consumption and private investment and reduced unemployment.

Murwirapachena, Choga, Maredza and Mavetera (2013) studied the effect of fiscal policy on unemployment in South Africa from 1980 to 2010 using vector error correction model and Johansen cointegration technique. The empirical findings indicated that government recurrent expenditure and tax increased unemployment while capital expenditure exerted a negative effect.

Wosowei (2013) examined the link between fiscal deficit and Nigerian unemployment rate from 1980 to 2010. The study model was estimated using the Ordinary Least Square while co integration of variables was verified using the Engle Granger test. The empirical findings showed a bi-directional causal association between unemployment and deficit; however the regression result was insignificant. Eze and Nwambeke (2014) emphasised the role of Deficit Financing in achieving full employment in Nigeria. The study examined the effect of deficit financing on unemployment rate in Nigeria using annual time series data for 44years (1970-2013) using VEC model and Johansen Co-integration. The study tried to validate the incidence of a long run linkage between unemployment and various sources of deficit financing. While deficit financing through external means and ways and means reduces the level of unemployed individuals in Nigeria which maintain economic stability in the short and long run, conversely deficit financing through internal borrowing increases unemployment and thereby causing instability in the economy.

Momodu and Ogbole (2014) examined public sector activities and macroeconomic variables in Nigeria within a period of forty years (1970- 2010) with a special focus on the effectiveness in the period of regulation (1970-1985) and deregulation (1986-2010) of the Nigerian economy. The time series data were analysed using Johansen's co-integration test, OLS, multiple regression analysis and Granger causality test to ascertain government expenditure and unemployment rate correlation. The empirical findings explained that the level of effectiveness of Government spending in reducing unemployment rate was marginally higher in the period of regulation compared to deregulation, though the difference was not statistically significant. The Granger causality test showed the absence of causality from government expenditure to GDP, inflation rate and unemployment. This result contradicts the findings of Wosowei (2013).

In a similar study, Obayori (2016) utilized aggregated yearly data (1980 – 2013) to study fiscal policy and unemployment in Nigeria. The Johansen-Juselius co-integration and parsimonious ECM analysis employed in testing revealed that the fiscal policy was effective in reducing unemployment in Nigeria. In an expanded study using the same tools of analysis, Egbulonu and Amadi (2016) examined the fiscal policy and unemployment rate association in Nigeria (1970 – 2013). The study exposed a negative relationship between unemployment and fiscal policy in long-run. Okoye, Evbuomwan, Modebe and Ezeji(2016) research used the vector error correction model (VECM) and granger causality test and found a significant negative and causal relationship.

Fagbohun (2017) investigated the impact of budget deficit on economic performance in Nigeria between 1970 and 2013 using the least square method and found that budget deficits did not enhance employment rate in Nigeria. Likewise, the empirical results from a study by Ayoguezee and Anidiobu (2017) indicated that government budget deficit had non-significant impact on unemployment rate in Nigeria within 1986 – 2015. The study also applied the Ordinary Least Square econometric technique. Ubi and Inyang (2018) also found out that fiscal deficit did not reduce unemployment rate within the period of study (1980 to 2016).

There seems to be a growing research directed towards examining the association between budget deficit and unemployment. These studies have however have provided varying results that might be attributable to the developmental level of economies, methodologies used and the period of data employed. Furthermore, few researches have considered budget deficit and unemployment rate long run association. Therefore, this research examined the effect of budget deficit on Nigeria's unemployment using very current data and eliminating the period of surplus budget.

### **2.3 Theoretical Framework**

Various theories have been postulated to evaluate the relationship between budget deficit and economic stability. Here, I will be discussing a few of such theories.

**Ricardian Equivalence Theorem:** The economic theory was proffered David Ricardo, a 19th century economist. The fulcrum of the theory is the neutrality of government intervention in the economy. The theory focuses on the inefficiency of all fiscal policies to fluctuate demand as it stipulates that deficit spending cannot shift the aggregate demand curve. Any means of financing the deficit would result in taxpayers having more money, however, the theory argues that the realization of a prospective increase in future tax would increase tax payers' propensity to save. The increased propensity to save results in a minimal or absence of variation in aggregate demand though there is an increase in government spending (Audu&Apere, 2013). In the absence of any effect on aggregate demand, deficit is unable to have any effect on employment. The main basis for this postulation, according to Buiter (2009), is the assumption of the existence of a single, representative infinite-lived, rational and far-sighted citizen. This assumption, Buiter observed, was unrealistic and impracticable as it is obvious that life is transient as people do not live forever. The rational expectation is also criticized as most citizens especially in developing economies tend to be myopic and spend more when their disposable incomes increase.

**Neoclassical Theory:** The theory postulates that deficit has a negative relationship with macroeconomic variables. It claims that the increases in interest rate, inflation level and current account deficits are all consequences of fiscal deficits. The theory further explicated that budget

deficit stifles the private sector economic activities (investments and consumption) and the growth rate of the economy. The Neoclassical school, unlike the Keynesian theory, assumes full employment of resources and claims that an increase in consumption indicates a reduction in savings. The decrease in savings reduces money available for investment hence interest rate must rise. Consequently, higher interest rates will cause a reduction in private investment, domestic production and eventually a rise in aggregate price level (Osuka&Achinihu, 2014;Lwanga&Mawejje, 2014).

**The Keynesian Unemployment Theory:** This theory is also called the cyclical or deficient-demand unemployment. The theory propounds that increase in money supply would dissipate into increased employment and output. It stipulates that unemployment occurs only when there is insufficient or deficiency in aggregate demand in the economy (Asaju, Arome and Anyio, 2014). Consequently, the prescription for reducing unemployment is the use of fiscal instruments by government to boost aggregate total demand (Laokulrach, 2013). Therefore an expansionary fiscal policy such as budget deficit will have a positive effect on unemployment rate. The assumption of the existence of unemployed economic resources by the Keynesian paradigm distinguishes it from the neoclassical paradigm. Furthermore, the theory posits that a large number of liquidity constrained and myopic persons existed (Bernheim, 1989). Tas (1992) and Osuka and Achinihu (2014) observed that the Keynesian view did not adequately take cognizance of the effect of the different means of financing deficit neither did it primarily describes the effects of temporary deficits which can be misleading to policy makers.

All of these schools of thought seem to have an appreciable applicability in Nigeria; however this research is based on the postulations of the Keynesian theory. The Nigerian economy is presently driven by the public sector and this theory encourages a high level of government intervention.

### **3.0 RESEARCH METHODOLOGY**

This study employs a quantitative analysis using the ex-post factor research design. The data for the study spans 21 years (1997 - 2017). The budget deficit in this study is represented by

government annual deficit while unemployment is the annual unemployment rate. Gross domestic product, Interest rate and Inflation rate are introduced as other explanatory variables.

The secondary data was collected from the Central Bank of Nigeria Statistical Bulletin (2017) and publications of the National Bureau of Statistics while econometric method based on linear regression and vector error correction mechanisms (VECM) were adopted in estimating the parameters of the model. Furthermore, diagnostic checks are also performed to test for heteroskedasticity and serial correlation.

The specification of the research model is modified from the works of Madueme and Nwosu (2011) and Edame and Okoi (2015). The unemployment–fiscal deficits model is specified as:

$$UER = f(GAD, GEX, FCF, EXP) \text{ -----(1)}$$

**Table 1: Lag order selection criteria**

VAR Lag Order Selection Criteria  
Endogenous variables: UER GAD GEX FCF EXP  
Exogenous variables: C  
Date: 09/11/18 Time: 13:05  
Sample: 1997 2017  
Included observations: 19

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-680.6736	NA	1.53e+25	72.17617	72.42471	72.21823
1	-608.8827	98.24022	1.24e+23	67.25081	68.74203	67.50318
2	-547.2982	51.86058*	5.34e+21*	63.39981*	66.13372*	63.86250*

\* indicates lag order selected by the criterion

The lag length selection criteria results in Table 1.0 above showed that most of the criteria, especially AIC, selected lag 2. Therefore, the Ordinary Least Square (OLS) estimation will thus become:

$$UER_t = \beta_0 + \beta_1 GAD_{t-2} + \beta_2 GEX_{t-2} + \beta_3 FCF_{t-2} + \beta_4 EXP_{t-2} + \mu \text{ -----(2)}$$

Where:

UER - Unemployment Rate (Consists of the percentage of the labour force that unemployed and underemployed.

GAD - Government Annual Deficit

GEX–Government Capital and Recurrent expenditure

FCF - Gross Fixed Capital Formation (expenditure on fixed assets – proxy for investment)

EXP - Value of exports of goods and services

$\beta_0$  is a constant, while  $\beta_1, \beta_2, \beta_3$  and  $\beta_4$  are coefficient parameters to be estimated

$\mu$  is the error term.

#### 4.1 Data Presentation and Analysis

##### Descriptive Analysis

**Table 2:** Summary of Normality test of the Variables

	UER	GAD	GEX	FCF	EXP
Mean	18.46667	-730.3220	2947.318	4246.332	7646.899
Median	14.90000	-285.1000	2450.897	1936.958	8309.758
Maximum	37.30000	-5.000000	8302.100	10571.74	15262.01
Minimum	3.400000	-3679.500	428.2152	231.6617	751.8567
Std. Dev.	9.126628	900.4092	2120.082	4316.156	5158.864
Skewness	0.406887	-1.910951	0.671549	0.453629	0.091717
Kurtosis	2.579710	6.587154	2.802697	1.334609	1.649743
Jarque-Bera	0.734013	24.04028	1.612485	3.147062	1.624735
Probability	0.692805	0.000006	0.446533	0.207312	0.443806
Observations	21	21	21	21	21

Source: Normality results from analysis using Econometric views.

The p-value of the Jarque-Beta test statistics for all the variables except GAD are greater than 0.05, hence the variables are normally distributed.

#### 4.2 Data Analysis and Results

##### Unit Root Test

Macroeconomic time series data are usually non-stationary and susceptible to spurious regression result; hence Augmented Dickey Fuller was utilized to test the stationarity of the time series at the outset of inferential analysis. ADF test revealed that all the variables were not stationary at level as their t statistics were greater than critical value at 5% signifying the presence of unit root. However, all the variables became stationary at 1<sup>st</sup> difference. The summary of the results of the Augmented Dickey-Fuller (ADF) unit root tests at 5% level of significance is presented Table 3.

**Table 3: Unit Root Tests Using Augmented Dickey-Fuller (ADF) method**

Variable	T-Statistic at 1 <sup>st</sup> Difference	P-Value	Remarks	Order of Integration
UER	-5.272035	0.0024	Stationary	1(1)
GAD	-3.763973	0.0496	Stationary	1(1)
GEX	-4.071804	0.0299	Stationary	1(1)
FCF	-4.204374	0.0187	Stationary	1(1)
EXP	-3.969477	0.0335	Stationary	1(1)

Source: Author's Compilation from ADF results from analysis using Econometric views (Appendix B).

The integration of all the variables at the same level difference indicates that OLS regression is sufficient for estimating the underlying relationship between unemployment rate and government annual deficit.

### Ordinary Least Square Test

Dependent Variable: UER  
Method: Least Squares  
Date: 09/11/18 Time: 13:08  
Sample (adjusted): 1999 2017  
Included observations: 19 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	10.98680	1.097868	10.00740	0.0000
GAD(-2)	0.010915	0.003199	3.411821	0.0042
GEX(-2)	0.008776	0.001657	5.297497	0.0001
FCF(-2)	0.001578	0.000413	3.825539	0.0019
EXP(-2)	-0.001884	0.000372	-5.059809	0.0002
R-squared	0.952930	Mean dependent var		20.04737
Adjusted R-squared	0.939482	S.D. dependent var		8.053389
S.E. of regression	1.981175	Akaike info criterion		4.426191
Sum squared resid	54.95074	Schwarz criterion		4.674728
Log likelihood	-37.04881	Hannan-Quinn criter.		4.468253
F-statistic	70.85743	Durbin-Watson stat		1.594959
Prob(F-statistic)	0.000000			

Source: Regression results from analysis using Econometric views.

The estimated model from the above regression result is:

$$UER = 10.987 + 0.011GAD_{t-2} + 0.001GEX_{t-2} + 0.002FCF_{t-2} - 0.002EXP_{t-2}$$

This estimated model specified a positive Government Annual Deficit and Unemployment Rate association. It also shows that a percentage increase in Government Annual Deficit (GAD) will increase the Unemployment Rate by about 0.01%. The t-statistic has a p-value of 0.004 which provides evidence that Government annual deficit has a significant effect on unemployment rate. Furthermore, government expenditure and fixed capital formation also had positive and

significant effect on unemployment rate. Contrariwise, Export indicated a negative but significant effect on unemployment rate.

Similarly, F-Statistic of 70.85 with a significance of 0.000 shows that the model estimated has overall statistical significance in explaining the variations in Nigeria's unemployment rate. Additionally, the Coefficient of determination ( $R^2$ ) of 0.95 and  $R^2$  adjusted of 0.94 provided that the independent variables were able to explain a large percentage (95%) of the changes in unemployment rate. These findings reveal that the estimated model has sufficient explanatory and predictive power. However, the Durbin Watson statistic of 1.6 shows the existence of minimal positive serial correlation within the model.

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.018590	Prob. F(2,12)	0.9816
Obs*R-squared	0.058686	Prob. Chi-Square(2)	0.9711

The null hypothesis of the LM test is that there is no serial correlation. The serial correlation LM test result for this equation with 2 lags in the test equation does not reject the null of no serial correlation.

Heteroskedasticity Test: Harvey

F-statistic	0.292788	Prob. F(4,14)	0.8778
Obs*R-squared	1.466724	Prob. Chi-Square(4)	0.8325
Scaled explained SS	1.588123	Prob. Chi-Square(4)	0.8109

All three statistics do not reject the null hypothesis of homoskedasticity. The result of the serial correlation and heteroskedasticity tests indicates that the OLS model provides efficient estimates. According to Dufour (1982), parameter stability is especially important for a model to be utilized for forecasting and policy simulations. To investigate the existence of a possible structural instability, the study used the Cusum test and found that the cumulative sum remained within the area between the two critical lines indicating that test did not detect any systematic eventual



movements and that the coefficients values reflect structural stability.

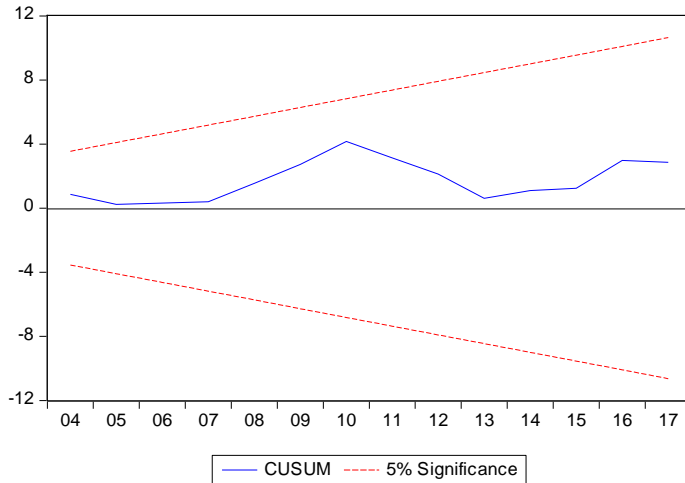


Table Result of Johansen Co-integration Test

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.894773	52.33768	29.79707	0.0000
At most 1	0.480547	11.80824	15.49471	0.1664
At most 2	0.001034	0.018623	3.841466	0.8913

Trace test indicates 1 cointegrating eqn(s) at the 0.05 level

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.894773	40.52944	21.13162	0.0000
At most 1	0.480547	11.78961	14.26460	0.1188
At most 2	0.001034	0.018623	3.841466	0.8913

Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level

The trace and maximum eigen value values indicate the existence of one cointegrating equation at the 0.05 level therefore the presence of cointegration between the variables is established. The johansen results suggest that a long-run co-movement relationship exists that is, there is a long-run relationship between unemployment, budget deficit and government expenditure.

### 4.3 Vector Error Correction Model

The result from the johansen test serves as a sufficient basis for the construction of Error Correction Mechanism (ECM) to model the variables dynamic relationship.

**The VEC model is stated as:**

$$\Delta UER_t = \beta_0 + \sum_{i=1}^n \beta_1 \Delta UER_{t-1} + \beta_2 \Delta GAD_{t-1} + \beta_3 \Delta GEX_{t-1} + \lambda ect_{t-1} + \mu_t$$

$ect_{(t-1)}$  is the error correction term obtained from the cointegration model.

Vector Error Correction Estimates

Date: 09/12/18 Time: 10:22

Sample (adjusted): 1999 2017

Included observations: 19 after adjustments

Standard errors in ( ) & t-statistics in [ ]

CointegratingEq:	CointEq1		
UER(-1)	1.000000		
GAD(-1)	0.008353 (0.00087) [ 9.59693]		
GEX(-1)	-0.001286 (0.00025) [-5.11458]		
C	-9.547850		
Error Correction:	D(UER)	D(GAD)	D(GEX)
CointEq1	-1.149930 (0.30984) [-3.71132]	-41.29938 (45.4950) [-0.90778]	-8.585826 (80.2253) [-0.10702]
D(UER(-1))	0.087068 (0.22145) [ 0.39317]	1.302830 (32.5161) [ 0.04007]	9.545593 (57.3385) [ 0.16648]
D(GAD(-1))	-0.000882 (0.00262) [-0.33677]	0.771419 (0.38471) [ 2.00520]	-1.211172 (0.67839) [-1.78536]
D(GEX(-1))	-0.003105 (0.00217) [-1.43177]	0.392066 (0.31841) [ 1.23133]	-0.826571 (0.56148) [-1.47213]
C	2.304260 (0.82844) [ 2.78145]	-197.0206 (121.641) [-1.61969]	460.7747 (214.500) [ 2.14813]
R-squared	0.581723	0.309356	0.268588

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Adj. R-squared	0.462215	0.112030	0.059613
Sum sq. resids	108.2968	2334832.	7260246.
S.E. equation	2.781274	408.3794	720.1312
F-statistic	4.867659	1.567737	1.285264
Log likelihood	-43.49398	-138.2904	-149.0679
Akaike AIC	5.104629	15.08320	16.21768
Schwarz SC	5.353166	15.33174	16.46621
Mean dependent	1.778947	-186.6374	411.3151
S.D. dependent	3.792621	433.3757	742.6058

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Source: Vector Error Correction results from analysis using Econometric views.

The Cointegrating long run equation is then estimated as:

$$UER = 1.0000UER + 0.0084GAD_{(t-1)} - 0.0013GEX_{(t-1)} - 9.5479$$

From the table, the error correction term coefficient is negative (-1.149930) with a significant p-value (0.0023) revealing the existence of long run causality running from the variables to unemployment rate. The negative and significant adjustment coefficient implies that the process converges in the long run. The previous period deviation from long run equilibrium is corrected in the current period at an adjustment speed of 115%. The disequilibrium of unemployment rate of previous year will adjust back to the long run rate equilibrium of unemployment rate and be corrected in the current year. The result supports the presence of a long run association existing between unemployment rate and budget deficit.

## 5.0 DISCUSSION OF FINDINGS:

The findings revealed that Government Annual Deficit has a significant positive effect on the Unemployment Rate in Nigeria. Taking into cognizance of the sign of the absolute value of budget deficit used in the regression analysis, this signifies that increase in budget deficit decreases the unemployment rate in Nigeria. This claim is in congruence with the Keynesian view of the result of government intervention via fiscal policies. The empirical conclusion of the presence of a significant positive effect of budget deficit on unemployment rate is consistent with the findings of Bargawi and McKinley (2011), Battaglini and Coate (2011), Tagkalakis (2013), Kato and Miyamoto (2015) and Obayori (2016). However, it contravenes the findings of Fagbohun (2017), Ubi and Inyang (2018), Ayoguzee and Anidiobu (2017), Mahmood et al. (2014) and Murwirapachena, Choga, Maredza and Mavetera (2013).

The Johansen cointegration test and vector error correction model also showed the existence of a long run and positive budget deficit and Nigeria's unemployment rate association. This negates the absence of any association between deficit and unemployment revealed by the study by Laokulrach (2013) and the negative association found by Egbulonu and Amadi (2016).

## **6.0 CONCLUSION AND RECOMMENDATIONS:**

The reduction of unemployment plays a critical role in development especially in emerging economies such as Nigeria. Hence the study on the topic remains a relevant discourse especially with the extended deployment of persistent budget deficit in Nigeria. The paper sets out to ascertain the effectiveness of budget deficit policy in the Nigeria economy between 1997 and 2017 by examining its effect on unemployment rate. The empirical model was developed in the light of recent developments in the methodology of econometric modeling and the analysis of time series with stochastic non-stationary components. The unit root analyses of the series understudied clearly showed that these variables are non-stationary and were integrated of order 1. This result provided sufficient ground for the regression of a parameterized model using the ordinary least square which showed that budget deficit had a positive effect on unemployment rate in Nigeria. Furthermore, adopting cointegration and error correction modeling strategy, the relationship between Nigeria's budget deficit and unemployment rate were analyzed through a series of reduction from over-parameterized model interrelating unemployment rate, budget deficit, government expenditure and error correction term. The co-integration test revealed that there is a cointegration relationship between budget deficit and unemployment rate. The conclusion of this study therefore is that budget deficit played an effective role as a fiscal tool in Nigeria. However, even though budget deficit is an economic stabilizer that ultimately results in increased output and employment, a significant and sustainable reduction in the fiscal deficits is essential because a high level of fiscal deficit relative to economic growth will adversely affect savings and investment, and consequently economic growth. Therefore the study recommends that deficit spending should be targeted towards effective and productive expenditures which will result to Gross Domestic Product (GDP) growth rate that is higher than the interest rate culminating into a fall in the ratio of debt to GDP over time i.e the national debt shrinks relative

to the size of the economy. Furthermore to encourage growth, deficit financing should not be financed via tax increase or local borrowing.

Further studies on unemployment rate should be investigated using other government fiscal policies such disaggregated government expenditure and debt stock.

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