

**GOVERNMENT EXPENDITURE AND UNEMPLOYMENT NEXUS IN
NIGERIA: A VECM APPROACH****¹Adejayan Ganiyu Kehinde and ²Koledoye Emmanuel Sunday**¹Department of Economics, Adekunle Ajasin University, Akungba-Akoko, Nigeria.²CES, University of Abuja, Abuja, Nigeria.

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ABSTRACT

The public is scrutinizing and looking at the current unemployment rate in Nigeria despite the government's increased spending. Therefore, this study examined the relationships between government spending and unemployment in Nigeria from 1991 to 2020. The stationarity test was conducted using the Augmented Dickey-Fuller (ADF) test, and the long-term link between the variables was confirmed using Johansen co-integration. The unit root test revealed that the study's variables were stationary at the 5% level of significance, and the bound co-integration test confirmed a long-term relationship between the variables. The Vector Error Correction Model (VECM) was used to analyze the parameters of the study's variables. The finding confirmed capital expenditure (CEX) has a direct and non-significant relationship with unemployment rate (UEM) with absolute t-statistic of 0.61600 and t-value of $t_{0.1} = 1.697$ for lagged one period; while, lagged two of CEX was significant and directly related to unemployment rate (UEM). The non-significant nature of the lagged one of capital expenditure (CEX) could be attributed to the fact that most of the funds assigned for capital expenditure are not often used effectively for capital projects; hence, worsen the rate of non-engagement of economic active age within the country. Therefore, government must channel its spending to capital project and not solely rely on price stability as a means to reduce unemployment within the economy.

KEYWORDS: Capital expenditure, unemployment, VECM

1.0 INTRODUCTION

Fundamentally, effective government spending is necessary for improved economic welfare through the creation of job opportunities and a decrease in the rate of unemployment, regardless of the dominant economic system either capitalist, socialist, or mixed. Public sector spending is required to reduce the failure of the free market economy and to efficiently distribute the available economic resources among the various components of the economy, as is the case in a capitalist economy where the macroeconomic indices are subject to the interaction of supply and demand forces (Lam, 2000; Nwosa, 2014).

In order to encourage economic growth in their respective nations during the 2007–2008 financial crisis, governments around the world, notably those of the United States of America and the United Kingdom, enacted an expansionary fiscal policy (Selase, 2019). This demonstrates that government engagement is unavoidable for enhancing economic wellbeing of the populace through the provision of fundamental social amenities or infrastructures and the distribution of subsidies during times of social unrest or disease breakout (for instance, the 2019 Corona-virus pandemic), leading to full employment so that the government can raise spending to create jobs in the productive sections of the economy.

As a result, a key aspect of the Nigerian economy has been the rate of growth in government spending. Because of the size of the government and the extent of social instability, such as the devastating insurgency, the public sector has spent more money, which may have been redirected to the economy's unproductive side and lessened its impact on job growth. However, expansionary fiscal policy, or an increase in government spending, is intended to raise prices while lowering the rate of unemployment based on the theoretical premise of the Philips curve (Dritsaki & Dritsaki, 2013). According to Obayori (2016) and Matsumae & Hasuni (2016), an increase in government spending usually results in more money flowing into the economy and more work prospects for the unemployed.

It is paradoxical that despite the rise in government spending over time in Nigeria, socioeconomic indices like the unemployment rate do not accurately represent the enormous expenditures. Despite the fact that the economy has grown at an average annual rate of at least 2.79 percent since the GDP was rebased in 2010 (Central Bank of Nigeria (CBN), 2019), with the exception of a decline in 2016, the unemployment rate in Nigeria has remained above 8 percent for four years running (WDI, 2019).

A number of studies have been carried out to ascertain the connection between public sector expenditure and unemployment (Nwosa, 2014; Al-saraireh, 2014; Holden & Sparrman, 2016; Obayori, 2016; Abubakar, 2016; Cvecic & Sokolic, 2017; Onodugo, Obi, Anowor, Nwonye & Ofoegbu, 2017; Odo, Elom-obed, Okoro & Nwachukwu, 2017, Muammil, 2018; Salase, 2019; Onuoha & Agbede, 2019; Nwaeze, 2019). While some studies pointed out a negative relationship exists between the variables (Nwosa, 2014; Holden & Sparrman, 2016; Obayori, 2016; Onodugo *et al*; Nwaeze, 2019); some revealed that a positive relationship exists between the variables (Al-saraireh, 2014; Cvecic & Sokolic, 2017; Muammil, 2018) while others found divergent relationships (Abubakar, 2016; Salase, 2019; Onuoha & Agbede, 2019).

In particular, Abubakar (2016) discovered a positive but insignificant relationship between public sector spending and unemployment, whereas Salase (2019), Onuoha, and Agbede (2019) established that spending on infrastructure and education decreases the rate of unemployment, whereas spending on health and defense increases it. Additionally, while Odo, et al. (2017) came at the opposite conclusion from Al-saraireh (2014), who found no causal relationship between the variables, Al-saraireh (2014) found none. Reexamining the topic is necessary in light of these conflicting viewpoints in the literature. The direct impact of public capital spending on unemployment in Nigeria from 1991 to 2020 is therefore examined in this paper. .

There are four sections to this study. The introduction is covered in Section 1, along with the study's goals and research questions. The review of the literature is the subject of Section 2. The study's methodology was covered in Section 3, while Section 4 deals with data analysis, result interpretation, conclusions, and policy recommendations based on the findings.

2.0 REVIEW OF LITERATURE

Onodugo, Obi, Anowor, Nwonye, and Ofoegbu (2017) used a variety of regression models to analyze the effect of public spending on the unemployment rate in an expanding economy between 1980 and 2013. According to the study, the primary method for lowering unemployment in the medium to long term will be private sector investment and capital spending. Additionally, due to the shaky statistical foundation of the unemployment rate's assessment, recurring spending has little impact on it.

Matsumae and Hasuni (2016) conducted research on the effect of government spending on unemployment in Japan. The impulse response function demonstrated that government investment and consumption both enhanced the channel for lowering unemployment through a rise in aggregate demand. Additionally, there is no effect of government expenditure on private consumption, and government investment in private sector productivity raised real wages but had little effect on changes in unemployment rates over time.

Salase (2019) used the Generalized Method of Moments (GMM) methodology to analyze the impact of disaggregated public spending on the unemployment rate of several African countries from 2000 to 2017. According to the research, spending on infrastructure and education caused unemployment rates to drop, whereas spending on health care and defense caused jobless rates to rise. This suggests that the association between defense spending and unemployment may be caused by a high rate of social vices and crimes, but the relationship between health spending and unemployment may be caused by corruption and poor administration of public funds.

Similar research was conducted by Onuoha and Agbede (2019) on the effects of disaggregated public spending on unemployment rates in the following countries: Benin, Cameroun, Egypt, Ethiopia, Ghana, Central African Republic, Mauritius, Chad, Morocco, Namibia, Nigeria, Equatorial Guinea, South Africa, Sudan, Tanzania, Angola, Kenya, Togo, Botswana, and Tunisia from 2000 to 2017. The study used the Generalized Technique of Moments method. The research also showed that spending on infrastructure and education lowers unemployment rates, whereas spending on health care and defense raises them.

By analyzing the impact of capital and recurrent spending on the country's unemployment rate between 1980 and 2013, Obayori (2016) looked at the impact of fiscal policy on unemployment in Nigeria. The approaches of the error correction model were used in the investigation. The analysis found a strong but unfavorable association between government capital and recurrent spending and unemployment in Nigeria. The outcome demonstrated that the federal government's economic policy is successful in lowering Nigeria's unemployment rate.

Omodero (2019) used the ordinary least squares (OLS) technique to examine the impact of sectoral government spending on poverty alleviation from 2000 to 2017. The regression result showed that government spending on construction, agriculture, education, building, and

health did not significantly affect poverty alleviation in Nigeria, which may be due to insufficient funding for these economic sectors.

In Nigeria from 1980 to 2015, Odo, Elom-obed, Okoro, and Nwachukwu (2017) looked at the connection between unemployment and inflation. Causation test using Granger and the vector error correction technique According to the study, both short- and long-term inflation had a considerable impact on unemployment in Nigeria. The research also revealed a strong causal connection between the study's factors. Nwaeze (2019) investigated the connection between public spending and job creation in Nigeria from 1985 to 2017. The study used an error-correcting econometric model and the Granger causality test. According to the analysis, there is a one-way causal relationship between government spending and economic services in the short run, with the coefficient between unemployment rates and economic services expected to be negative. The study also concluded that there was no causal link between government transfer spending and the unemployment rate in Nigeria.

Muammil (2018) investigated how government spending and private investment affected Indonesia's employment growth and unemployment rate. The study's approach was based on the path analysis. The results demonstrated that employment was positively impacted by government spending and private investment. The study also found a weak but substantial negative link between private investment and unemployment rate. The government's spending on social infrastructure, which has no direct impact on job creation, means that it has no impact on Indonesia's unemployment rate.

Using Pearson correlation and multiple regression analysis, AL-saraireh (2014) examined the connections between the unemployment rate in Jordan, government spending, the foreign labor force, and economic growth rate. The study found a significant positive connection coefficient with government spending and a negative but still significant correlation coefficient between migration labor force and unemployment rate. The study also discovered that the amount of government spending is sufficient to forecast Jordan's unemployment rate.

Nwosa (2014) investigated how government spending from 1981 to 2011 affected unemployment and the prevalence of poverty in Nigeria. The study used the Ordinary Least Square (OLS) estimate method. The study found that while government spending had a negligible negative influence on the rate of poverty, it had a considerable beneficial impact on the rate of unemployment.

Holden and Sparrman (2016) examined the impact of government spending on unemployment in 20 OECD nations from 1980 to 2007. The results demonstrated that a rise in government spending in absolute terms caused the unemployment rate to decline. Government spending has a bigger and more lasting influence on unemployment when labor market institutions are less accommodating to employment, as well as in fixed exchange rate regimes as opposed to floating ones. Increased government purchases had a favorable impact on the employment to population ratio in the OECD economies, according to research on the impact of government expenditure on unemployment.

Using the Granger causality method and an error correction model, Okere, Uzowuru, and Amako (2019) examined the link between government spending and economic development in Nigeria from 1981 to 2016. The outcome of the estimate demonstrated that there is a bi-directional causal relationship between economic growth and government spending on both administration and economic services. A unidirectional causality was also discovered in the study, spanning everything from community services to economic expansion.

Using an OLS regression test, Duke and Nneji (2015) observed how government spending affected the Nigerian economy. According to the report, government spending has a sizable impact on the Nigerian economy. In a similar line, Udoffia and Godson (2016) used the OLS estimation method to examine the impact of public spending on the Nigerian economy from 1981 to 2015. The analysis found that long-term capital and recurrent government spending are growth-enhancing.

3.0 METHODS

Theoretical Framework and Model Specification

The theoretical framework is based on the Keynesian theory. According to the Keynesian theory of unemployment, employment will rise if decreases in money wages are not accompanied by decreases in aggregate demand. If not, it will result in joblessness. The hypothesis claimed that overall economic spending has a significant short-term impact on economic growth through full employment. As a result, it is believed that the economy is a system that requires active government intervention through spending in order to achieve full employment. The idea also suggested that government spending may boost economic growth by boosting government consumption, which would then boost employment due to an increase in investment. According to the Keynesian idea, the only way to guarantee full

employment was for the government to actively intervene in the market through government spending. This would ensure that markets allocated resources efficiently (Sangkuhl, 2015).

Therefore, from theoretical view point, the model for this study is specified as follows:

$$UEM = f(CEX, IFD, TIV, INF) \quad 3.1$$

Where:

UEM = Unemployment rate

CEX = Capital expenditure

IFD = Infrastructural development index

TIV = Total investment (using gross fixed capital formation as proxy)

INF = Inflation

4.0 RESULTS AND DISCUSSIONS

Unit root test

Unit Root Test

This study employed both Augmented Dickey Fuller (ADF) unit root test. This was necessary in order to ensure that the time series data were estimated in their stationary format. Also this study sought to avert the occurrence of spurious regression. The essence of these tests was to verify the null hypothesis of unit root or non-stationary stochastic process. To reject the presence of unit root, the ADF statistics must be more negative than the critical values at 5% significant level. The results of ADF test statistics for the levels and first differences of the annual time series data for the period under investigation were presented in Table 4.1.

Table 4.1: Results of Augmented Dickey Fuller Unit Root Test.

Test at Level					Test at first level difference			
Variable	Test Statistic	5% critical value	Level	Decision	Test Statistic	5% critical value	Level	Decision
UEM	/1.143258/	/2.981038/	I(0)	NS	/4.309087/	/2.981038/	I(1)	S
CEX	/0.113531/	/2.981038/	I (0)	NS	/5.528729/	/2.981038/	I(1)	S
IFD	/1.081703/	/2.976263/	I(0)	NS	/6.228182/	/2.976263/	I(1)	S
TIV	/2.204565/	/2.967767/	I(0)	NS	/3.616303/	/2.971853/	I(1)	S
INF	/1.990209/	/2.967767/	I(0)	NS	/5.249134/	/2.971853/	I(1)	S
Where; S indicates Stationary; NS non Stationary								

Source: Author's computation, 2023

The result from the Table 4.1 revealed that unemployment rate (UEM), capital expenditure (CEX), infrastructural development index (IFD), total investment (TIV) and inflation rate

(INF) were not stationary at level using ADF unit root test. Since their absolute values of the ADF test statistics of UEM, CEX, IFD, TIV and INF were less than the 5% critical value in absolute term. However, at first difference, UEM, CEX, IFD, TIV and INF were stationary because the absolute value of test statistics is greater than the 5% critical value and the probability values of variables are less than the 0.05 level of significance. The implication of this finding is that at first level difference each of the identified variables was not characterized with unit root problem.

Co-integration Result

This study employed Johansen co-integration technique to test whether there is a long-run relationship between the dependent and independent variables in the model, by employing the Trace and Max-Eigen Statistics respectively at 5% significance level.

Table 4.2: Johansen Co-Integration Test.

<i>Traces Statistics</i>					
$r = 0$	$r = 1$	$r = 2$	$r = 3$	$r = 4$	
168.2216 (95.75366) { 0.0000*}	106.3733 (69.81889) { 0.0000*}	59.42017 (47.85613) { 0.0029*}	21.19958 (29.79707) { 0.3453}	7.189089 (15.49471) { 0.5558}	0.050682 (3.841466) { 0.8219}
<i>Max-Eigen Statistics</i>					
$r = 0$	$r = 1$	$r = 2$	$r = 3$	$r = 4$	
61.84830 (40.07757) { 0.0001*}	46.95309 (33.87687) { 0.0008*}	38.22059 (27.58434) { 0.0015*}	14.01049 (21.13162) { 0.3642}	7.138408 (14.26460) { 0.4729}	0.050682 (3.841466) { 0.8219}
* denotes rejection of the null hypothesis at the 0.05 level, Critical value at 5% level in (), &Prob in { }					

Source: Author's computation, 2023

The results from both Traces and Max-Eigen Statistics established the presence of three co-integrating equations. Therefore, confirmed a long-run relationship between the variables and the use of VEC. This implies that the set of identified co-integrated time series in the model have an error-correction that indicates the presence of the long run adjustment mechanism. Given this, Dalina and Liviu (2015) reveal that VECM is a suitable technique for a model if there is the presence of co-integrating vectors among the set of variables in a model.

Lag Order Selection

Table 4.3: Lag Order Selection.

Lag	LogL	LR	FPE	AIC	SC	HQ
1	-612.3057	NA	3.030013	48.02265	49.75043*	48.53641
2	-587.2144	27.87928	9.680013*	48.83070*	52.28626	49.85822*
3	-518.1071	46.07151	2.939113	46.37831	51.56165	47.91959
* indicates lag order selected by the criterion						

Source: Author's computation, 2023

Optimal lag selection criteria revealed that there is an indication that five criteria; Final prediction error (FPE), Akaike information criterion (AIC) and Quinn information criterion (HQ) selected lagged two; while, Schwarz information criterion (SC) selected lagged one. As such, this study selected optimal lag of two.

Vector Error Correction Estimates

Table 4.4: Vector Error Correction Estimates.

CointEq1:	0.611291	R² : 0.751921		
	(0.25850)	AdjR²squared: 0.696157		
	[2.36476]	F-statistic : 1.543023		
Δ(UEM(-1))	Δ (CEX(-1))	Δ (IFD(-1))	Δ(TIV(-1))	Δ(INF(-1))
0.249040	0.447600	-0.514566	0.079010	0.922000
(0.09156)	(0.61600)	(0.23082)	(0.07397)	(0.81512)
[2.71995**]	[0.72660]	[-2.22929**]	[1.06810]	[1.13112]
Δ (UEM(-2))	Δ(CEX(-2))	Δ ((IFD(-2))	Δ(TIV(-2))	Δ(INF(-2))
-0.359657	-0.565647	0.340130	0.068652	-0.650300
(0.57677)	(0.30173)	(0.18075)	(0.03136)	(0.40195)
[-0.62357]	[-1.87468*]	[1.88177*]	[2.18915**]	[-1.61786]
Standard errors in () & t-statistics in [], t-value (t_{0.05}= 2.042, & t_{0.1} = 1.697				
** & * indicate statistically significant at the 0.05 and 0.1 level				

Source: Author's computation, 2023

The findings from Table 4.3 shows that the lagged Error Correction ECM₍₋₁₎ included in the model to capture the long run dynamics between the co-integrating series are correctly signed (negative) and statistically significant, judging from the t-value. The absolute estimated coefficient value of the lagged Error Correction ECM₍₋₁₎ was 6.1% with the absolute t-statistic (2.36476) greater than the t-value (t_{0.05}= 2.042) at 5 % level. This finding implies that a long run causality ruined from capital expenditure (CEX), infrastructural development index (IFD), the interaction of capital expenditure and infrastructural development (CEX*IFD), total investment (TIV) and inflation rate (INF) to unemployment rate (UEM).

This implies that the independent variables in the model jointly moved at the constant rate of 6.1% annually from disequilibrium that occurred from the short-run to long-run.

The results for unemployment rate (UEM) for lagged one was significant; while that of lagged two was non-significant with a direct effect. For the lagged one period, its t -statistics (2.71995) was greater than the t -value ($t_{0.05} = 2.042$) at 5% significance level with a coefficient value of 24.9%. While, that of second year was non-significant at 5% significance level with a value of 35.9%. In economic term, this implies that there is currently increase in number of people that fall within the economic active age but find no work to do.

For the capital expenditure (CEX) variable, the finding confirmed a direct and non-significant relationship with unemployment rate (UEM) with absolute t -statistic of 0.61600 and t -value of $t_{0.1} = 1.697$ for lagged one period; while, lagged two of capital expenditure (CEX) was significant and directly related to unemployment rate (UEM). The non-significant nature of the lagged one of capital expenditure (CEX) could be attributed to the fact that most of the funds assigned for capital expenditure are not often used effectively for capital projects; hence, worsen the rate of non-engagement of economic active age within the country. For the lagged two periods, the finding was in support of the formulated *a priori* expectations. The indirect and significant nature of the finding was not surprising when looking at the fact that when there is massive investment in capital projects, it encourages more investors to invest in the economy. Therefore, leads to more factors input and labour that reduced the rate of unemployed in the economy.

The result also revealed that lagged one period and lagged two period of infrastructural development index (IFD) were statistically significant at 5% and 10 conventional level, judging from the p -values of the estimated result that was less than 0.05 and 0.1. The mechanical interpretation of this is that provided all the variables are held constant, infrastructural development index (IFD) of the past one year and last two year had a negative and positive effects on unemployment rate (UEM). These findings have two implications on unemployment rate. First, investment on infrastructural facilities encourages investment in the critical sector of the economy which increase the rate of job opportunity; hence, reduces unemployment in the economy. Secondly, poor investment in the real sector of the economy reduces the space of job opportunity that worsens unemployment. The negative of lagged one period was consistency with the formulated *a priori* expectation; while the positivity of

lagged two period was contrary to the *a priori* expectation. The positivity and significant effect of the result could be attributed to corruption in the country.

Furthermore, total investment (TIV) was directly related to unemployment rate (UEM), but non-significance at both 0.05 & 0.10 level for lagged one period; while that of lagged two period was significant and positively related to it. From the finding, it was established that t -value ($t_{0.05}= 2.042$, $t_{0.1}=1.697$) was less than the t -statistic (2.189) of total investment (TIV) for lagged two. This implies that the aggregate total investment had infinitesimal impact on unemployment reduction.

The coefficient result of inflation rate (INF) for both lagged one and lagged two periods was non-significant at 5% and 10% significant level, judging from their respective absolute t -statistic of 1.13112 and 1.61786 that less greater than t -value of $t_{0.1}= 1.697$. Statistically, this implies that inflation rate (INF) has infinitesimal impact on unemployment rate on the country. This implies that managing inflation spiral in the country cannot alone reduce the rate

DISCUSSION OF FINDINGS

From the findings, it was discovered that capital expenditure (CEX) for lagged one period exhibit a positive sign but non-significant, judging from its absolute t -statistic of 0.61600 that was less than t -value of $t_{0.1}= 1.697$; while, lag two of capital expenditure (CEX) was significant and inversely related to unemployment rate (UEM). The non-significant of capital expenditure (CEX) for lagged one period with a positive sign could be attributed to the fact that most of the funds assigned for capital expenditure are not often used effectively for capital projects; hence, worsen the rate of unemployment in the country. These findings have two implications unemployment rate in the country. First, massive investment by government on critical areas in the past year led to employment opportunity through massive job creations by investors; hence, reduces poverty rate. Second, in the past one year, unemployment has been on increase despite the rate of capital project. For the lagged two periods, the finding supports the formulated *a priori* expectations; while of lagged one was contrary to it. The reason for this may be due to inadequate in capital expenses on capital projects by government, as well as, corruption that limit the amount budget for the sector. For the indirect link and significant relationship, studies like Abubakar (2016), Matsumae and Hasuni (2016) and Salase (2019) and Onuoha and Agbede (2019) concluded that capital spending lowers unemployment rates. Also, on the contrary finding, Obayori (2016), Omodero (2019) and

Odo (2017) confirmed that a non-significant relationship between the duo; with a conclusion that capital expense cannot alone reduce unemployment in the country.

CONCLUSION

Capital expenditure positively related to unemployment rate but non-significant; while, that of lagged two periods was significant and inversely related to unemployment rate. It was concluded that expenses incurred on capital project by government provides job opportunity through investment in the economy by investors. Total investment was confirmed to exhibited a positive sign for lagged two and significant; while that of lagged one was non-significant with a positive sign. It was concluded that investment not directed towards real sector of the economic worsens unemployment rate. Inflation was positively related to unemployment rate for lagged one period but non-significant; while, lagged two period was non-significant and inversely related to it. It was concluded that managing inflation rate alone cannot reduce unemployment rate in the country.

RECOMMENDATIONS

1. Government must channel its spending to capital project and not solely rely on price stability as a means to reduce unemployment within the economy, but rather employ more approaches to reduce the rate of people that fall within the economic active age but fall no work to do.
2. The apex banks within the country should ensure that its monetary policy is geared towards investment programmes by encouraging both international and local players to participate fully in the financial institution. Doing this would make funds available for critical investment in the country.
3. In addition, the government must ensure that capital expenditures are accountable in order to lower the rate of diversion of resources that worsens unemployment despite the significant sums of money expended by the government.

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