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Is There a Trade-Off Between Employment and Economic Growth in Nigeria?

Dr. Gbatsoron Anjande* Dr. Dennis Terpase Nomor Dr. David Terfa Akighir Department Of Economics, Benue State University, Makurdi-Nigeria

Abstract

The study has investigated the nature of the relationship between employment and economic growth in Nigeria. The study used time series data spanning from 1980 to 2017. First, the augmented dickey –fuller unit root test was conducted on the series and it was discovered that all the variables became stationary after the first difference. Given the uniform order of integration, the Johansen co-integration test was employed and it was found that there is a long-run relationship between GDP growth and employment levels in Nigeria. Using Vector Error Corrections Model, the study found out that there exist a tradeoff between employment and economic growth in Nigeria. The study recommend policies that will enhance productivity in Nigeria. The strategies could be in form of lowering taxes and increasing government spending in the country.

Keywords: Economic growth, Employment, Trade off DOI: 10.7176/JESD/10-14-10

Publication date: July 31st 2019

1. Introduction

According to Eriksson, (1997), popular and political discussion of the relationship between economic growth and employment is generally afflicted with deep ambivalence. This is more evident when we consider the fact that since the industrial revolution the belief that technological progress, which is a panacea for growth, creates unemployment has become more popular. On the contrary, however, the vast productivity increases that have occurred in the last two centuries (see Madison, 1991), have not actually led to any long-term increasing trend in unemployment. It is therefore, fair to conclude that there is no long-term crowding-out effect from the technological innovations create unemployment in the short run. For example, Eriksson (1997) argued that technological innovations make workers redundant because of automation or less useful because they lack the special skills or education that the new technology requires, or they force firms that are less successful in innovating to scale down their production, or even close down their business. This, however, does not imply that unemployment has to increase permanently. The unemployed workers are reallocated to new jobs with varying degrees of successes. (Davis and Haltiwanger 1990).

Historically, majority of economists hold the view that there is no inherent conflict between employment and economic growth (Jhingan, 2010). At least, it is clear that some sectors, especially the service sectors like distribution, transportation and communication have largely profited from increasing scale and capital-deepening which in many cases has been combined with an expansion in jobs. With the spread of information and communication technology (ICT) and the knowledge-economy capital-deepening in the service industry increasingly tends to take the form of accumulating intangible capital, knowledge and skilled or semi-skilled labor.

Nigeria government like many other developing nations have over the years, been pursuing extensive and intensive development for overall integration into the world economy. According to Manh, Ngeo & Dao (2018), a sound employment policy plays an important role in this regards. While economic theory suggest that there exists a trade-off between employment and economic growth, there has been little research using national data to confirm this argument. Existing studies by on employment and economic growth (Adebayo and Ogunrinola, 2006; Omotor and Gbosi, 2006; Sodipe and Ogunrinola, 2011; Oloni 2013; Kareem, 2015 and Olu et al 2016) concentrated on either the impact of employment on growth, growth on employment or employment elasticities of economic growth. In view of the unfolding reality coupled with the debates above, this paper attempts to examine the trade-off between employment and economic growth in Nigeria.

2. Literature review

Okun (1962) was the one that first carried out a study of an assessment of unemployment and output. He reported a negative short-run correlation between unemployment and output that has become known as okun's law. After publication of okun's study in 1962, a number of authors have been involved in this discussion of the relationship between productivity and (un)employment either from the short run or long run perspective. Particular authors of interest include Tobin (1993), Kaldor (1985), Solow (1997) and Rowthorn (1999).

Tobin's (1993) study emphasizes the short run perspective. According to him, employment and output are driven by aggregate demand in the short run. Aggregate spending affecting some sectors increases spending in other sectors. As pertaining to the long run, he argues that when the unemployed become employed their acquired

skills and their human capital have a persistence effect for output. As a result potential output in the long run rises. Output growth will not only increase employment and reduce unemployment but also increase productivity. Whether productivity in the short run will rise faster than output and thus keep employment stagnant is, to our knowledge, not specifically addressed by Tobin.

Kaldor (1985), while discussing Okun's law, recognizes that employment growth will be de-linked from output growth in the short run: this becomes very close to the relationship that has become known as Verdoorn law. The short period productivity gain associated with an increase in output is largely a reflection of the economies gained from higher capacity utilization. The Verdoorn law on the other hand compares the productivity growth differences associated with different trend-rates of growth between different regions and countries" (Kaldor, 1985, p.45) in contrast to these transitional differences of productivity and output growth, the long run nexus of productivity and employment growth is, due to capacity utilization or reallocation of resources from low or negative employment growth, seen as positive in Kaldor (1985).

In a recent contribution, stressing the arrow learning by doing approach, Solow discusses the above nexus. Yet, in the forefront is productivity and output growth and not the effect on employment. Solow stresses that it is not a higher saving rate that leads to a higher output growth rate. Higher saving rates lead only to a higher level of output per capita in the long run. It is only a higher productivity growth rate (higher rate of technical progress) that leads to persistence of higher growth rates. The emphasis of Solow's work is on long term economic growth and less on the effect of growth on (transitory or persistent) employment. Fluctuations of employment can be considered in a Solow growth model by explicitly including the labor market and the Phillips curve into the Solow growth model. This has not been considered by Solow. Yet, as Solow stresses in many of his writings, demand constraints will generate employment constraints.

Rowthorn (1999) in his paper argues for a clear negative effect in the nexus of investment, productivity change, and unemployment, since investment and productivity – if capital and labor substitution is allowed for – lead to new net job creation. This effect is shown in the context of a model using a CES production function with elasticity of substitution between labor and capital below unity. Certainly, another important factor also mentioned by Rowthorn is the long run labor supply impacting the long run nexus of productivity and unemployment.

In most of the econometric literature, only technology shocks have been seen to have persistent effects. In terms of the effects on output and unemployment, demand shocks have only a short run effect but not in the long run. On the other hand, the literature postulates that only productivity increases appear to have long run effect on output. A set up like this is presumed in recently used VAR tests with supply and demand shocks. Blanchard and Quah (1989) for example presume that supply shocks (productivity shocks) have permanent effects on output, but not unemployment. Demand shocks have, due to nominal rigidities, only a temporary effect on both output and employment.

In the context of a demand constrained model as in Kaldor (1985) or Tobin (1993), it can be said that in the short run technology shocks may have a negative effect on employment (positive effect on unemployment). Yet, one might also agree that productivity shocks may lead to a persistent employment effect and, thus, to reduction of unemployment in the long run. Following the analysis of the long term growth pattern, the study by Van Ark, Frankema and Duteweerd (2004) investigates under which conditions, in which regions and which industries a trade-off occurs between productivity and employment growth. They conclude that patterns of employment-productivity trade-offs are established across regions and time periods at the macro level.

The study by Rezai and Semmler (2007) concludes that a large increase in productivity may increase unemployment in the short run. In the short run, workers lose jobs to productivity advances that are not compensated for immediately by the new opportunities created by the rising demand or corporate profits that result immediately from the productivity increases. Thus, there is a possible mismatch of cause and effects in terms of time. Using Maximum Likelihood Estimation (MLE), Structural Vector Autoregression (SVAR) and non-parametric time-varying estimation Chen, Rezai and Semmler (2007)) show that in the short run productivity growth affects unemployment positively. In the long run, however, the productivity growth reduces unemployment.

Findings by Rezai and Semmler (2007) reinforce the central claim that productivity growth brings affluence to a society over time. But it can also bring short term struggle and sacrifice. A large increase in productivity may increase unemployment in the short run. Even if the increase is slight, as analysis by Rezai and Semmler (2007) suggests, it is nevertheless moving in the opposite direction than has been widely predicted. Unemployment, all else equal, should have fallen. What seems to be the case is that in the short run, workers lose jobs to productivity advances that are not compensated for immediately by the new opportunities created by the rising demand or corporate profits that result immediately from the productivity increases. Thus, there is a possible mismatch of cause and effects in terms of time.

On the trade-off between employment and economic growth specific studies, Gordon, (1995); Choudhry & Ark, (2010); Herman, (2012); and Junankar, (2013) found a trade-off between employment and economic growth. Eriksson (1997) and Tang (2015) on the other hand found no trade-off between employment and economic growth. According Tang, (2015), what exist is not real economic growth, it is an outcome of market forces in reallocating

production resources between industries to rebalance the changes in demand and supply conditions of the industries within an economy.

The analysis by Obadan and Odusola (2005) established some stylized facts about productivity and unemployment in Nigeria. From their study, it is clearly evident that productivity is low in Nigeria. Unemployment, on the other hand (when combined with underemployment) is very high. Evidence from the analysis of productivity and employment linkage shows bicausal relationships in all the cases, except in the agricultural sector. The evidence therefore rejects the neo-classical framework for productivity and employment linkage. The results of the relationship between productivity and unemployment are mixed. The results show that bi-causal relationships exist in the industrial sector while a unidirectional relationship (running from productivity to unemployment) is established at the national level. However, no linkage is established in the agricultural sector, thereby suggesting that rural unemployment, in most cases, may not arise from the generalized deterioration in agricultural performance.

Their results also show that contrary to the general expectation that an increase in productivity leads to a reduction in employment (particularly, where there is no compensating increase in overall demand), labor productivity is followed by labor absorption at the current level, at both the national level and agricultural sector. This relationship, particularly in the agricultural sector follows the traditional Cobb-Web theory. The opposite however exists when a lagged value is incorporated. The evidence from the industrial sector supports the general notion, where employers use less labor to accomplish the same volume of output as productivity rises. Meanwhile, following the accelerator principle, additional labor is absorbed in the next period.

Umoru (2013) empirically examined whether employment impacts significantly on GDP growth in Nigeria and found that, both the short-run and long-run growth effects of employment in Nigeria are significant and positive. In the same way, studies by Adebayo and Ogunrinola, (2006); Omotor and Gbosi, (2006); Sodipe and Ogunrinola, (2011); Oloni (2013); Kareem, (2015) and Olu et al (2016) in Nigeria, has also found a positive and significant relationship between employment and economic growth. This means that employment growth leads to economic growth in the long-run in Nigeria. Funlayo (2013) and Oloni (2013) on the other hand, found an insignificant but positive relationship of economic growth with employment. The papers concluded that, growth in Nigeria does not support employment.

2.1Employment and growth in Nigeria

According to Olu, Afeikhema, Nebena And Olufunke (2015), Nigeria has continued to witness significant growth above the continental average in the last one and a half decades. Table 1 shows that Nigeria's GDP grew from 3.1 per cent in the 1990s to more than an average of 5 per cent beginning in 2000, largely driven by the value addition from the service sector. The major service subsectors include retail and wholesale, real estate, information, and communication (Barungi et al. 2015).

	1990-94	1995-99	2000-04	2005-09	2010-14	2015-2018
Agric. Value added (% of GDP)	25.4	27.5	29.2	25.1	21.9	20.85
Industry value added (% of GDP)	24.8	22.4	22.3	21.2	25.5	22.32
Services value added (% of GDP)	49.8	50.1	48.4	53.7	52.6	50.48
Growth in GDP (%)	3.1	2.1	6.5	6.3	5.7	0.81

Table 1: Growth and Share of Different Sectors in Nigeria GDP growth, 5-year averages (1990-2018)

Source: World Development Indicators, 2018

A cursory look at the table reveals that the growth rate of GDP had started to slow down from 2015 and even went into recession before slightly picking up. In all these, the share of the services sector to GDP is growing very high. However, the challenge with this sector is that, the sector is dominated by foreigners and the sector utilizes capital-intensive technology that requires little labor for its operations. Thus, much employment may not be expected from the sector in spite of its astronomical growth in the country.

2.2 Unemployment Analysis in Nigeria

Employment levels in Nigeria appear not to be in line with the growth level of the country's GDP; some have argued that the country has over time experienced exclusive growth but not inclusive growth, hence the high level of unemployment in the country. The unemployment rate across Nigeria as shown in figure 2 has been very high since the beginning of this century. The figure below has shown that since 2000, the rate of unemployment has grown at a compound annual average of over 5.0 per cent, even as it has continued to fluctuate and intensify. This scenario continued up to 2017.

DOI: 10.7176/JESD



Figure 2: Unemployment Rate in Nigeria from 1970 to 2018

3. Methodology of the Study

The study has employed econometric analysis to explore the cause-and-effect relationship between GDP growth rate and employment in Nigeria. The study has utilized time series data spanning from 1980 to 2015. This choice of period is predicated on the premise that it coincides with the period of sap.

3.1 Model Specification

This model has its theoretical foundation from the okun's law in 1962. The okun's law explains that changes in output cause changes in unemployment. Thus, model for this study is expressed as follows;

Empt = f(GDP, FPI, PE)(1)

Where, Empt is total employment, GDP is the gross domestic product, FPI is foreign private investment (a proxy for foreign direct investment), and PE is public expenditure. The inclusion of foreign direct investment and public expenditure in the model because foreign direct investment and public expenditure contribute to employment creation in Nigeria.

Assuming a linear relationship between explanatory variables, the explicit form of equation (1) becomes: $Empt_t = \beta_0 + \beta_1 GDP_t + \beta_2 FPI_t + \beta_3 PE_t + \varepsilon_t$(2)

We now replace GDP with the growth rate of GDP represented by GGDP to obtain: $Empt_t = \beta_0 + \beta_1 GGDP_t + \beta_2 FPI_t + \beta_3 PE_t + \varepsilon_t$ (3)

3.2 Estimation Technique

The study used the vector autoregressive (VAR) model to estimate equation 3. This technique is suitable for the study because it can help to examine the intertemporal dynamics of the relationship among the variables in the model. Also, the technique has the ability to isolate the short-run and long-run effects among the variables. This allow us to estimate the trade-off between employment and economic growth in Nigeria. Assuming p optimal lags, the equation 3 can generally be specified in VAR as follows;

It is often hard to interpret the coefficients of VAR model, most especially if it includes many variables and lags which usually lead to problem of identification making it difficult to ascertain dynamics between the variables one wishes to examine. To overcome this problem, we use the impulse response function (IRF) which gives the estimated VAR model an explicit economic interpretation. The IRF refers to the reaction of any dynamic system in response to some external change.

Phillips (1998) showed that, long-run impulses are inconsistent with variables which are nonstationary {i.e stationary at first difference or are of order I(1)}. When series are integrated of order I(1), the series have lost long run information. On the basis of this, cointegration test is conducted to infer if the linear combination of the series will result into a long-run relationship by incorporating the error correction model to determine how long, the long

run equilibrium will be achieve. The VECM framework models variables that integrated of order 1 and cointegrating relationships that are present in the data. In this study, the result of unit root test and cop-integration results justified the application of VECM. Therefore, model 4 is explicitly expressed in a VECM form as follows;

4. Results and Analysis

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In order to avoid spurious regression estimates, the augmented dickey- fuller (ADF) stationarity test technique was used to test the null hypothesis of unit root of the time series used in the study, the results are presented in table 3. Table 3: ADF unit root test results

Variables	Level	First	1% critical	5% critical	10% critical	Order of
		difference	value	value	value	integration
D(gGDP)	-2.4480	-9.4372	-3.6394	-2.9511	-2.6130	I(1)
D(empt)	-2.6003	-4.9609	-3.6463	-2.9540	-2.6158	I(1)
D(fpi)	-0.4551	-6.3671	-3.6394	-2.9511	-2.6143	I(1)
D(pe)	1.4023	-5.3743	-3.6537	-2.9571	-2.6174	I(1)

Source: Author's computation using eviews 9

The unit root results in table3 reveals that all the variables became stationary after the first difference. Thus, the null hypothesis of unit root in the time series used is rejected. This implies that any shock to the series will fade out with passage of time. Also, the past values of these series would be used to predict the future values. Therefore, any policy formulated and implemented on the basis of the regression estimates emanating from these series other things being equal would be potent. Given the uniform order of integration among these series, it became apt to use the johnanson co-integration technique to ascertain the long-run equilibrium condition of the variables. The johnason long-run equilibrium statistics of trace and maximum eigen statistics are shown in the following tables.

Table 4: unrestricted cointegration rank test (trace)

Hypothesized No. Of ce(s)	Eigen value	Trace Statistic	0.05 Critical value	Prob.**
None *	0.741906	80.31783	47.85613	0.0000
At most 1	0.424332	26.97602	29.79707	0.0963
At most 2	0.408434	14.30488	15.49471	0.0527
At most 3	0.075308	2.505443	3.841466	0.1135
	_	=	=	=

DOI: 10.7176/JESD

Hypothesized No. Of ce(s)	Eigen value	Max-eigen Statistic	0.05 Critical value	Prob.**
None *	0.741906	43.34181	27.58434	0.0002
At most 1	0.424332	17.67115	21.13162	0.1426
At most 2	0.408434	12.79943	14.26460	0.1194
At most 3	0.075308	2.505443	3.841466	0.1135

Table 5: unrestricted cointegration rank test (trace)

The results from tables 4 and 5 reveal that both the trace statistic and the max-eigen statistic indicate one cointegrating equation. This led to the rejection of the null hypothesis of no co-integration among the variables. This implies that there is a unique long-run relationship among the variables. This suggest the VEC model for this study

4.1 Vecm Impulse Response

To capture the dynamic response of total employment to changes in gross domestic product, foreign private investment and public expenditure, the employed Vector Error Correction Model to estimate the impulse response. The dynamic response of gross domestic product was also analysed in order to capture for the likely trade off between employment level and growth. The results presented in figure 1;



DOI: 10.7176/JESD

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The result in figure 1 above showed that, unemployment level in Nigeria is likely to respond negatively to its dynamic changes in gross domestic product in the first period by -0.23%. However, the response turns to positive in the third periods by 0.11 and the positive response becomes persistent throughout the forecast horizon. This is an indication that in the long-run, unexpected changes in gross domestic product in Nigeria may continually increase unemployment level without reverting. This is inconsistent with Okun's postulation that there exist a trade-off between unemployment and economic growth.

The result above also shows that, unemployment level in Nigeria is likely to respond positively to its own shock in the first period by 0.55%. However, the response turns to negative in the fourth period by -0.03 and remains negative up to the eight period. The response is likely to be positive in the ninth period but returns to positive in the tenth period. Its response to own shocks is likely to exhibit unstable flow as observed in the positive and negative swings throughout the forecast horizon. This is an indication that in the long-run, unexpected changes in unemployment in Nigeria may not necessarily trigger any response.

For 1% increase in shock due to foreign private investment, unemployment level in Nigeria does not respond in the first period but responded negatively in the second period and continue decline throughout the forecast horizon. This is an indication that increases in foreign direct investment has the capacity of reducing unemployment in Nigeria. For changes in public expenditure in Nigeria, unemployment is likely to be unaffected in the first period. The response decline from the second period up to the fifth period after which the response rise up to the ninth period. The response of the unemployment to dynamic changes due to public expenditure will likely be permanent due to the divergence of the response line from the impulse line in the tenth period.

Economic growth is likely to be unaffected by to dynamic changes of unemployment in Nigeria in the first period. This response will tend positive in the second period through to the fourth period, negative in the fifth period and return to positive in the sixth period. This responses will, however, be permanent as the response line diverge from the impulse line in the tenth period. This collaborates the response of unemployment to economic growth indicating that there is no trade off between growth and unemployment in Nigeria.

4.2 Forecast Error Variance Decompositions

In a VAR system, forecast error variance decomposition examines the contribution of a unit shock to each of the variables on the forecast error variance of a particular variable. This includes all series because the actual series is influenced by its own error variance and the error variance of the other series in the multivariate model. Based on the focus of this study, however, this subsection presents only the variance decompositions of Unemployment level and gross domestic product. The Variance decompositions of unemployment level and economic growth are presented in Tables 2a and 2b.

Journal of Economics and Sustainable Development ISSN 2222-1700 (Paper) ISSN 2222-2855 (Online) Vol.10, No.14, 2019

DOI: 10.7176/JESD

Tables 2a. Variance Decomposition of UEIMPT:							
Period	S.E.	GGDP	UEMPT	FPI	PE		
1	0.598773	14.53388	85.46612	0.000000	0.000000		
2	1.054475	17.27473	79.49102	0.304050	2.930198		
3	1.155157	15.28586	81.15039	0.305396	3.258351		
4	1.362826	34.52931	58.34646	2.142587	4.981643		
5	1.706224	46.37015	43.19644	1.818582	8.614835		
6	2.115274	60.07716	32.47064	1.320354	6.131849		
7	2.647507	70.73285	23.59438	1.276521	4.396241		
8	3.259206	75.46763	17.32167	2.865055	4.345646		
9	3.399099	76.71072	16.25355	3.008790	4.026943		
10	3.635061	77.79862	15.12471	3.463711	3.612953		

Tables 2a. Variance Decomposition of UEMPT:

Tables 2b. Variance Decomposition of GGDP

Period	S.E.	GGDP	UEMPT	FPI	PE
1	6.932955	100.0000	0.000000	0.000000	0.000000
2	9.582349	67.79365	2.009161	0.113657	30.08353
3	9.990637	62.54382	3.763000	0.818470	32.87471
4	11.13808	53.12525	5.602158	1.769713	39.50288
5	12.48943	44.73385	5.208873	1.519481	48.53780
6	12.71609	43.38438	5.270743	2.853500	48.49138
7	13.08069	41.43743	4.982911	3.434552	50.14511
8	14.29922	40.54052	10.83953	3.246847	45.37310
9	14.35099	40.45119	10.76164	3.381081	45.40608
10	14.90075	37.74517	15.52579	3.136311	43.59273

From Table 3a, the forecast error variance of unemployment in Nigeria in the first period of the forecast horizon is explained both by its own unit shock and growth rate shock. Changes in unemployment is explained by 85.5% of its own shock while it explained by 14.5% dynamic changes in economic growth. Unemployment is not explained by Foreign Private investment and public expenditure in this period. In the second period however, a unit shock in unemployment is able to explain about 17.3%, 0.3% and 2.9% the forecast error variance of economic growth, foreign private investment and public expenditure respectively. The contribution of economic growth to the forecast error variance of unemployment in Nigeria appears to improve over time while the contribution of foreign private investment and public expenditure fluctuate.

Results from Table 2b, the forecast error variance of economic growth in Nigeria in the first period of the forecast horizon is explained by its own unit shock. In the second period however, a unit shock in economic growth is able to explain about 2.0% the forecast error variance of unemployment. In the same period, unit shocks in Foreign Private investment and public expenditure is respectively account for about 0.12% and 30.87% the forecast error variance of economic growth in Nigeria. In the same way, the contribution of economic growth to the forecast error variance of unemployment in Nigeria appears to improve over time while the contribution of foreign private investment and public expenditure. From the results above, it is clear that there is a feedback mechanism between unemployment and economic growth in Nigeria.

5. Conclusion

The study was carried out to ascertain if there is tradeoff between employment and economic growth. The data use data on unemployment level to proxy employment and found out that unemployment and economic growth moves in the same direction in Nigeria. This implies that, it is apparent that employment does not move in the same direction with GDP growth, it however, seems that in Nigeria; productivity is still low, meaning that growth is not technology driven. Nevertheless emergent from the findings of this study, it is concluded that Nigeria has over time experienced exclusive growth that has precipitated a trade-off between GDP growth and employment levels in the country. This is in agreement with funlayo (2013) who concluded that growth in Nigeria does not support employment. The study recommends policies that will enhance productivity in Nigeria. The strategies could be in form of lowering taxes and increasing government spending in the country.

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