HUMAN CAPITAL, UNEMPLOYMENT AND ECONOMIC GROWTH IN NIGERIA

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Abstract

The paper examines the impact of human capital and unemployment on economic growth in Nigeria between 1981 and 2020, using Johansen Co-integration and Autoregressive Distributed Lag (ARDL) techniques to achieve the objective of the study. The theoretical framework of the study was derived from Solow Swan New-classical growth model. We ascertained the stationarity of the time series properties of the study, using Augmented Dickey Fuller (ADF). The result of findings of the study showed that the level of human capital in Nigeria is not sufficient to stimulate economic growth in the country. The study further confirmed that growth in unemployment rate has adverse effect on economic growth in the country during the period of study. The study therefore recommended that government should place priority on financing human capital through health and education expenditures and embark on self-employed programmes to solve the problems of unemployment with the aim of attaining sustainable economic growth in the country.

Keywords: Human Capital, Unemployment, Economic Growth, Autoregressive Distributed Lag.

Introduction

Every economy tends to achieve its macroeconomic policy on economic growth, full employment and human capital development. According to Aderemi (2014), Odonkor (2017) and Adeyemi and Ogunsola (2019), the higher the level of human capital development, the higher the effectiveness and efficiency in the productivity level in the economy. Organization for Economic Cooperation and Development (OECD, 2001) defined human capital as knowledge, skills, competences and features that enable individuals, social and economic well-being. The particular elements of human capital include: health, education, experiences, skills etc. Human capital development produces high skilled and semi-skilled labour for employment opportunity to produce goods and services for economic growth. The inability of these skilled and semi-skilled to secure a permanent job at a prevailing market wage-rates is termed unemployment. Unemployment has being a major inimical to the well-being and standard of living of both employed and unemployed, and it usually have negative impact on the performance of the economy. Unemployment gives room for un-utilized human and natural resources in an

economy. It results to high dependency ratio, which would have multiplier effects of low consumption, low savings and low investment in one hand, and poverty in another hand.

The relationship between human capital development and unemployment was the focus of Samiullah (2014); Massnighan and Tam (2015) and Izedonmi and Urhie (2005). They all agreed in their different submissions that an increase in human capital investment could lead to reduction in unemployment rates.

Human capital and economic growth is a prevailing issue in the literature. According to Adeyemo and Ogunsola (2016); Odonkor (2017); Aderemi (2014); Fashina, Asaleye, Ogunjobi and Lawal (2018), there is a positive and significant relationships between human capital and economic growth. Human capital as a factor of production that co-ordinates all other factors of production make use of their intelligence and technical expertise for higher productivity and economic growth.

In addition, the relationship between unemployment and economic growth was examined by Kukay (2018); Shkumbiri and Myrrete (2017); Salim, Safia and Issa (2017); Ojima (2019); and Akintola, Messiah and Araf (2018), they all followed and accepted the principle of "Okun's law" which laid emphasis on the negative relationship between unemployment and economic growth or national output. In economics principle, output and employment moves together, more output will attracts more employment opportunities; but Okun's law says a fall in unemployment will increase the national output. According to Okun's law, a 1% point fall in Unemployment tends to raise 3% point in gross national product. It therefore shows a negative relationship between the two macroeconomic variables.

According to the National Bureau of Statistic (2017), unemployment rate in Nigeria has increased since 1999 despite some structural reforms on agricultural and industrial sectors by the government to reduce the unemployment rates. The rate increased from 8.2% in 1999 to 13.6% in 2001, 14.8% in 2003, 17.8% in 2014 and 22.8% in 2018.

The results of findings of some earlier time studies were not consistent. While Salim, Safia, and Issa (2017) examined long run positive relationship between unemployment and growth, Ojima (2019) observed long run inverse relationship between the variables. Some studies like Victoria (2019) studied the effects of human capital investment on unemployment in Nigeria without testing the staionarity of the set of data employed. Such study can produce biased results. This study therefore is appropriate to bridge the existing gap. The objective of this study is to examine the effect of human capital and unemployment on economic growth in Nigeria and to offer appropriate recommendations.

Empirical Literature

Adejumo (2017) examined the impact of Human capital development on employment generation in Nigeria between 1970 and 2014. He made use of Auto Regressive Distributed Lag (ARDL). The result of the analysis showed that trends in human capital are not sufficient to stimulate employment in Nigeria. He further stressed that there is need to go further from traditional learning structure to embrace education for development. He also emphasized that not only human capital affects unemployment, but other socio-economic structures like technology, ICF and inflation. He therefore advised the policy makers to develop the infrastructural facilities, promote innovations, and reallocate resources to more productive sectors.

In their contribution to literature Salim, Safia and Issa (2017) examined the impact of unemployment on economic growth in Tanzania. The study made use of co-integration and dynamic ordinary least square approach to test the relationship between the two variables. The result of the findings showed that the unemployment rate has positive impact on economic growth. It also revealed a unidirectional causal relationship between unemployment and economic growth. The study therefore recommended that government should take urgent steps to reduce the rising unemployment rate.

The effects of human capital investment on unemployment in Nigeria was the focus of Victoria (2019) between 1981 and 2015. She made use of ordinary least square method (OLS) for the analysis. Findings showed that the government investment in human capital in terms of education expenditure should be increased significantly. Also adequate training should be put in place to reduce the high unemployment rate in the country.

The research carried out by Sahoo and Sahoo (2019) to examine the relationship between unemployment and some macroeconomic variable in India between 1991 and 2017, using cointergration test. The variables such as unemployment, real gross domestic product, consumer price index, gross fixed capital formation, labour and literacy rate were used in the investigation. The results of the finding revealed that significant long-run relationship exist among the variables. It also revealed unidirectional relationship between unemployment and real gross GDP. Based on the findings, the study recommended that government should create more employment opportunities to reduce high rate of unemployment and to encourage agriculture so as to absorb unemployment population in modern method of agriculture with modern equipment.

Samiullah (2014) examined the relationship between unemployment and human capital in Pakistan. Secondary data was used while OLS and Johansen co-integration technique was applied to process the data. The results of the finding showed that an improved education and health care sectors would reduce unemployment in Pakistan. The findings also showed that all human development indicators in the study have significant and effective effect on unemployment rate in the study area. The study recommends an increased funding of education and health care delivery. In addition, government should endeavor to concentrate on the control of population, creation of investment is essential to take care of the increasing population and to reduce the high rate of unemployment.

The issue of unemployment and economic growth in Nigeria was the interest of Ojima (2019). The objective of the study is to investigate the relationship between employment and economic development using regression analysis and time series data for 28years. The result of the findings shows that unemployment has negative effect on economic development and there is an inverse relationship exists between unemployment and economic development in Nigeria. The study recommended that government should create job opportunities to reduce high unemployment rate and also use both fiscal and monetary policy to encourage job creation. In addition, job training and skill acquisition programmes should be put in place to encourage unemployment to be trained with the view to be self-employed.

In their contribution to economic growth and unemployment, Soyln, Cakmark and Okun (2018). Investigated the relationship between growth and unemployment in Eastern European Countries. Panel data with OLS and Panel Johansen co-integration test were applied. The result showed that

there was a positive relationship between unemployment and economic growth. An increased in GDP will reduce unemployment rate.

Oye (2011) wrote on implication of unemployment on the gross domestic product in Nigeria. The objective of the study was to examine the effect and relationship between unemployment and the gross domestic product of Nigeria for 9 years, secondary data were collected while regression method was use to process the data. The result shows that there was an inverse relationship between unemployment and GDP growth. The study recommended that government should solve unemployment through public sector reform and that government should have good management system for the economy. It went on to advise government on the provision of effective and efficiency electricity supply as well as the security of the country to allow foreign investors into the country.

Adelowokan (2012) examined the effect of education and health expenditures on economic growth in Nigeria between 1970 and 2010 using a static regression model. He established long-relationship between human capital spending and economic growth using the Engle-Granger two-step cointegration procedure.

In furtherance to discussion on unemployment and economic growth, Omotosho and Longe (2017), examined the impact of unemployment and economic growth in Nigeria. The study used secondary data (1986-2015). Vector Auto Regression (VAR), Johansen co-integration test, impulse response test were applied to analyze the data. The results showed that the impact of unemployment, exchange rate, inflation rate and government expenditure varied over time. The study agreed that the principle of Okun's law and Philips curve is reality but not work in this situation in Nigeria. The study therefore advised government to see to the reduction in corruption within the governance and concentrate more in the reduction of high rate of unemployment in the country.

Akintola, Messiah and Araf (2018), examined the effects of unemployment on economic growth in Nigeria, covering 1986 to 2015. Secondary data were analyzed and ARDL Bounding testing model and ECM were used to test the relationship between variables. The findings revealed that there was no long-run relationship between economic growth and employment in Nigeria. But in the short run unemployment significantly and positively affects economic growth. The study also showed the reverse Okun's law in Nigeria. In the short-run, it states that when employment increases, economic growth decline in the short-run but increase in the third year of the short run.

Also contributing to literature, Kukaj (2018) studied the relationship between unemployment and gross domestic product growth in seven countries in Western Balkans. The study looked into the high unemployment rate which reflected on economic stagnation and the ability to utilize natural resources and lowering the standard of living of the populace. Secondary data was employed. The results of the findings showed that there exists a trade-off between unemployment and economic growth. The results showed a positive relative between GDP and Foreign investment.

Afolayan, Okodua, Mathew and Ojabohien (2019) examined how to reduce unemployment rate in Nigeria through electricity consumption and human capital development. Secondary data was used and Johanson-co-integration technique was applied to analyze the data. The result of the study showed that 21% increase in electricity consumption will lead to about 0.22% decrease in the level of unemployment. Furthermore, 1% increase in education expenditure will also lead to

0.17% decrease in unemployment rate. The study advised government to put in place policies that will employ quality and efficient graduates into the labour force.

Theoretical Literature

Solow swan Neo-classical growth model was postulated by Solow (1956) and Swan (1956). The model expanded on the Harrod-Domar model which postulates a continuous production function linking output to the inputs of capital and labour which leads to the steady state of equilibrium of the economy.

The theory is based on the assumptions of no technological progress, capitals are substitutes and constant saving ratio, among others.

Given the Solow Swan model assumptions, the

$$Y = f(K, L) \dots \dots (1)$$

Where:

Y is income or output, K is capital and L is labour.

Data Sources and Methodology

Secondary data were used and these were collected from the Central Bank of Nigeria Statistical Bulletins and the world data links. The time series data covers 1981 and 2020.

This study tends to find out the effect of human capital and unemployment on economic growth in Nigeria in the last 40 years. The study adopts the Augmented Solow Swan growth model being presented in equation 2 below:

Adopting from the equation one (1) of this study, where:

$$Y = f(HUC, UNR) \dots \dots (2)$$

Where: Y = Gross Domestic Production (GDP).

HUC = Human Capital proxy by Education Expenditure (EDE) and Health Expenditure (HTE)

UNR = Unemployment Rate

Considering control variables for equation 2, we have

$$GDP = f(EDE, HTE, UNR, PGR, GCF, IFR, AEC) \dots \dots (3)$$

Where: PGR = Population Growth Rate

GCF = Gross Fixed Capital Formation

IFR = Inflation Rate

AEC = Access to Energy (Electricity) and Consumption

Putting equation 4 in econometric form, we have:

$$GDP = \alpha_0 + \alpha_1 EDE + \alpha_2 HTE + \alpha_3 PGR + \alpha_4 UNR + \alpha_5 GCF + \alpha_6 IFR + \alpha_7 AEC \dots \dots (4)$$

The a-proiri expectation is a positive relationship between economic growth and EDE, HTE, PGR, GCF and AEC while negative relationship with UNR and IFR.

After testing for stationarity of the data set using Augmented Dickey Fuller model, the study employs Johansen Co-integration and Auto-Regression Distributed Lad Techniques to test for the long-run properties of the model parameters.

Results and Discussion

Unit Root Test

The unit root test results for the time series variables are presented in Table1 below. Unit root test was conducted in this study to find out if there are mixtures in the order of integration of the research variables. The order of integration of the time series was investigated by applying the Augmented Dickey and Fuller (1979) test.

Table-1. Unit Root Test Results

Variable	95% Critical ADF Value	ADF Test Statistic	Order of Integration	Remark
D(EDE)	2.951**	5.260	I (1)	Stationary
D(HTE)	2.954**	6.216	I (1)	Stationary
D(PGR)	2.957**	5.533	I (1)	Stationary
D(UNR)	2.971**	3.108	I (1)	Stationary
D(GCF)	2.951**	3.723	I (1)	Stationary
D(IFR)	3.540**	7.218	I(1)	Stationary
D(AEC)	2.957**	7.538	I(1)	Stationary

Source: Authors' Computations, 2020.
Note: ** = 5 percent significance.

From Table 1, the ADF test statistic for each of the variables are greater than the respective critical values. Thus, we reject the null hypothesis of unit roots in each of the time series. All variables became stationary after first difference. Hence, they are integrated of order I (1). Once all the series are non-stationary in the level but at first difference, co-integration tests can be applied for all variables.

Result of Cointegration Tests

Table 2. Test for Johansen Co-Integration Results

Unrestricted Cointegration Rank Test (Trace)				
Hypothesized		**Trace**	**0.05**	
No. of CE(s)	**Eigenvalue**	**Statistic**	**Critical Value**	**Prob.****
None *	0.845340	244.3019	159.5297	0.0000
At most 1 *	0.805984	178.9735	125.6154	0.0000
At most 2 *	0.709372	121.5801	95.75366	0.0003
At most 3 *	0.683809	78.33017	69.81889	0.0089
At most 4	0.343602	38.03089	47.85613	0.3007
At most 5	0.250854	23.29631	29.79707	0.2318
At most 6	0.182991	13.18758	15.49471	0.1081
Trace test indicates 4 cointegrating eqn(s) at the 0.05 level				
* denotes rejection of the null hypothesis at the 0.05 level				

Source: Authors' Computations, 2020

The result of the Johansen co-integration test shows that the trace statistics indicate four (4) co-integrating equation. This indicates that there is a long run relationship among the variables, hence the variables have high tendency to converge to long-run equilibrium level. Since the ADF test value for the residual is greater than the critical value, it is said to be stationary. Thus, the time series are co-integrated, implying that a long-run stable relationship exists among the variables used in this study. The study thereafter estimate the long run parameters for the study using ARDL technique. Before this, Table 3 below shows the estimated short run results of the research model, using Error Correction Model (ECM) analysis.

Table 3: Short-Run Estimated Result

ECM Regression				
Case 2: Restricted Constant and No Trend				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
D(GDP(-1))	-0.289577	0.085391	-3.391209	0.0037
D(AEC)	0.101267	0.019068	5.310813	0.0001
D(AEC(-1))	0.077258	0.019354	3.991865	0.0010
D(EDE)	-0.008809	0.006874	-1.281460	0.2183
D(EDE(-1))	-0.152399	0.026520	-5.746674	0.0000
D(GCF)	-0.392809	0.084082	-4.671725	0.0003
D(IFR)	-0.096950	0.027546	-3.519581	0.0028
D(HTE)	-0.047527	0.028346	-1.676645	0.1130
D(HTE(-1))	0.076511	0.018741	4.082610	0.0009
D(UNR)	-1.037014	0.234974	-4.413318	0.0004
ECM/CointEq(-1)*	**-0.860019**	**0.127705**	**-6.734415**	**0.0000**
R-squared	0.856914	Mean dependent var		0.367468
Adjusted R-squared	0.797295	S.D. dependent var		4.815042
S.E. of regression	2.167863	Akaike info criterion		4.636638
Sum squared resid	112.7911	Schwarz criterion		5.125461
Log likelihood	-70.14116	Hannan-Quinn criter.		4.805380
Durbin-Watson stat	2.386236			
* p-value incompatible with t-Bounds distribution.				

Source: Authors' Computations, 2020.

The result in Table 3 showed that the variables would converge to long-run relationship after forty (40) years movement among the variables as shown by the negative and significant coefficient of error correction term (ECM).

Table 4: Bounds Test: Auto-Regressive Distributed (ARDL) Long Run Result

BOUND TEST RESULT ARDL				
Significance	**Lower Class Bound.**	**Upper-Class Bound**	**F-statistics Value (K - 7)**	**Decision**
10%	1.92	2.89		Long-run
5%	2.17	3.21	3.359433	Long-run
2.5%	2.43	3.51		
1%	2.73	3.9		

Source: Authors' Computation, 2020.

The ARDL Bounds Test is usually used to examine if a long-run relationship exist among the variables. The criterion function is such that if the F-Statistic exceeds the upper and the lower bounds or critical values (10%, 5% or 1%), then a long-run relationship exists; thereby, leading to the rejection of the null hypothesis. In this case, the F-statistics of 3.359 is greater than both upper and lower class bound at 5% level of significance.

Table 5. ARDL Long-Run Relationship Result

Dependent Variable: GDP
Method: ARDL
Sample (adjusted): 1984 2020
Included observations: 35 after adjustments
Maximum dependent lags: 2 (Automatic selection)
Model selection method: Akaike info criterion (AIC)
Dynamic regressors (2 lags, automatic): AEC EDE GCF IFR PGR HTE UNR
Fixed regressors: C
Number of models evalualted: 4374
Selected Model: ARDL(2, 2, 2, 1, 1, 0, 2, 1)

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
GDP(-1)	-0.149596	0.180113	-0.830567	0.4184
GDP(-2)	0.289577	0.146081	1.982303	0.0649
AEC	0.101267	0.035588	2.845501	0.0117
AEC(-1)	-0.062550	0.033028	-1.893855	0.0765
AEC(-2)	-0.077258	0.037698	-2.049370	0.0572
EDE	-0.008809	0.013547	-0.650245	0.5248
EDE(-1)	0.032483	0.028783	1.128526	0.2757
EDE(-2)	0.152399	0.047911	3.180914	0.0058
GCF	-0.392809	0.152969	-2.567904	0.0206
GCF(-1)	0.228143	0.145139	1.571894	0.1355
IFR	-0.096950	0.040347	-2.402888	0.0288
IFR(-1)	0.055781	0.046125	1.209349	0.2441
PGR	-0.337331	0.692607	-0.487045	0.6328
HTE	-0.047527	0.047160	-1.007767	0.3286
HTE(-1)	-0.169736	0.056273	-3.016283	0.0082
HTE(-2)	-0.076511	0.028771	-2.659284	0.0171
UNR	-1.037014	0.392190	-2.644164	0.0177
UNR(-1)	-0.699884	0.425244	-1.645841	0.1193
C	20.67939	8.073239	2.561473	0.0209

R-squared	0.784845	Mean dependent var		4.328820
Adjusted R-squared	0.542795	S.D. dependent var		3.926647
S.E. of regression	2.655079	Akaike info criterion		5.093781
Sum squared resid	112.7911	Schwarz criterion		5.938112
Log likelihood	-70.14116	Hannan-Quinn criter.		5.385244
F-statistic	3.242494	Durbin-Watson stat		2.386236
Prob(F-statistic)	0.011047			

Source: Authors' Computation, 2020.

Table 5 presents the long-run relationship using GDP as the dependent variable. The Durbin-Watson statistics value is 2.386236 which is closer to 2, which means there is no serial autocorrelation. The F-statistics measure the joint significance of the variables. The F-statistics value is 3.242494 with the probability of 0.011047; this indicates that the independent variables jointly explained the dependent variable at a 5% significance level. The R-squared measures the determination of coefficient, measuring the fit of the model. The value of the R-squared is 0.784845, this shows that about 78% variation in the dependent variable is been explained by the variations in the independent variables. Hence, there is a good fit in the model. Likewise, the adjusted R squared measure the goodness of fit while the degree of freedom is put into consideration.

Evidence from the long-run result shows that education expenditure as an instrument for human capital development (EDE) is not statistically significant at the level of 5% and it is negative to economic growth in Nigeria. It was expected that education expenditure should be positively influence the economic growth in Nigeria but reverse is the case. The findings shows that an increase in education expenditure will reduced economic growth in Nigeria by -0.008%. The theoretical findings reveal that the quality of education in Nigeria does not contribute significantly to economic growth. From time immemorial, the public expenditure on education has had little or no impact on the economic growth in Nigeria and this is due to the low budgetary allocation made to this sector when compared with other sectors like defense and this leads to decline in the quality of education in Nigeria. Other reasons for the insignificant effect of education are corruption on the part of political leaders, unequal distribution of income between the rich and the poor, high inflation rate, poverty, to mention a few. This is not in consonant with the work of Adelowokan (2012).

The coefficient of the health expenditure (HTE) was negatively signed and statistically not significant at 5 percent level. The negative sign indicated that a unit percent increase in health expenditure would lead to 0.047 percent decrease in growth of the country. This result was not in conformity with the theoretical preposition but was in line with the work of Jaiyeoba (2015). A plausible explanation for this is that expenditure on health in Nigeria does not have the required positive multiplier effect.

The result of our study shows a negative relationship between population growth rate and the economic growth in Nigeria. This implies that a 1% increase in population growth will decrease economic growth by -33.73%. This implies that, the population growth rate in Nigeria has not been translated to an investment that should catapult the economy to a greater level. Statistically, population growth rate does not promote economic growth in Nigeria.

The long run coefficient of unemployment Rate (UNR) obtained is -1.037014% which is negative and the probability value is significant meaning that unemployment has great adverse impact on economic growth in Nigeria. This study negates the outcome of Salim, Safia and Issa (2017) whose work shows that unemployment rate has positive impact on economic growth in the study area. Nevertheless, the study corroborates the work Ojima (2019) whose findings show that unemployment has negative effect on economic development and there is an inverse relationship exists between unemployment and economic development in Nigeria.

The long run regression result of the coefficient of inflation rate (IFR) has a negative (-0.096950) impact on the economic growth in Nigeria. The implication of this result is that as long as the

inflation rate reduces the economic growth of the country would be on the increasing side. The country therefore should as much as possible control inflation to at least a single digit level.

Finally, it was reveals that 1% rise on access to electricity consumption (ACE) will cause 10.1267% increase in economic growth in Nigeria. The t-test statistics shows that t_{cal} (2.845501) > t_{tab} (2.042) at 5% level of significance. So access to electricity consumption will cause 10.1267% increase in Nigeria industrial output thereby lead to increase national output (GDP). This signified that electricity is a bedrock of growth development in any country especially in industrial sector. The adequate and consistent supply electricity in Nigeria would promote industrial output and cost efficient in industrial production thereby reducing cost per unit of their output and will command demand from the consumers leading to increase in economic growth per period of time.

Conclusion and Recommendations

This study has been able to articulate the relationship among human capital, unemployment and the economic growth in Nigeria between 1981 and 2020. The evaluation of all the variables became stationary at level and first difference. The result of the Johansen co-integration test shows that the trace statistics indicate four (4) co-integrating equations. The study therefore used the ARDL bound estimation techniques to examine the existence of long run and short run dynamic relationship among human capital, unemployment and economic growth in Nigeria.

The study revealed, through F-statistics and R square that, there exists a good relationship between the dependent variable and the independent variables. The empirical results showed that the level of human capital in Nigeria is not sufficient to stimulate economic growth in the country. Therefore, human capital development needs to go beyond the traditional learning structures and embrace education for development, where there is a match between skills acquired and the skills required in the economy.

Also, it was discovered that the issue of unemployment in Nigeria is beyond the issues of population growth as advanced by some previous studies.

Based on the findings of this study, the following recommendations are made:

- Government spending on human capital in terms of education expenditure should be increased significantly.
- Government should create more employment opportunities to reduce high rate of unemployment and to encourage modern method of agriculture so as to absorb unemployed population in the country.
- Government should employ birth control framework to direct population growth rate to a desired level in Nigeria.
- Skill acquisition programmes should be put in place to encourage unemployed people to be self-employed with the aim of attaining sustainable economic growth in the country.

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