HUMAN CAPITAL DEVELOPMENT AND INDUSTRIAL SECTOR GROWTH IN NIGERIA

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ABSTRACT

This study evaluated the influence of human capital on industrial sector growth in Nigeria from 1986 to 2020. The Autoregressive Distributed Lag co-integration method of estimation was applied in the empirical analyses to determine the influence of human capital variables on industrial sector growth. The empirical observations revealed that government's recurrent investment in education had significantly negative short-run impact on industrial sector growth while in the long run, there was a significant positive influence. Government recurrent expenditure on health revealed short-run significant impact on industrial sector growth while in the long run, it was observed to be negative. The implication of this on the industrial sector is that for the desired level of industrial sector growth to be achieved, investment in education should be increased by government policy. The study suggests that there should be a premeditated government investment in education and health to achieve the desired level of industrial sector growth in Nigeria in the nearest future.
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JEL Classification: C01, C13, L6

INTRODUCTION

Human capital drive national development in all countries around the world (Isola & Alani, 2012). Hence, human capital development has become a central issue for policymakers and parties engaged in economic development at both national and regional levels, as the global economies shifts towards more knowledge-based sectors (such as manufacturing of ICT devices, pharmaceuticals, and telecommunication) and skills (Amadeo, 2016).

World Bank development indicators (WDI, 2020) show that the industrial sector provided only 13% of Nigeria's total employment in 1991. This however, dropped to 10.86% in 2007 and rose to 12% in 2019. As employment in sectors experience drastic reduction, the services sector kept experiencing increase in its employment. The employment rate in the service sector in 1991 was 36.7% this increased to 43.61% in 2005 and 53.03% in 2019.

Most previous studies on human capital development and its impact on Nigeria's economy have considered human capital development in individual sectors or on the Nigerian economy. Saka and Olanipeku (2021) examined the role of human capital in the relationship between industrialization process and growth in Nigeria. Okumoko et al. (2018) examined the dynamics of human capital development and industrial growth in Nigeria. James (2021) probed the relationship between human capital development, national security and agricultural growth in Nigeria.

In other studies, Ifunanyachukwu (2019) evaluated education, health expenditure and quality of Life in Nigeria. Popoola et al. (2019) and Ogunleye et al. (2017) examined impact of human capital development on economic growth in Nigeria within the different time frames. In other climes, Xuewei et al. (2020) studied effects of government healthcare expenditure on economic growth in 31 provinces in China. Ethem and Merve (2021) assessed effect of health spending on economic growth in Turkey. While these studies have analyze impact of human capital on economic growth; the dynamic nature of human capital and the need to continually update literature motivated this study.

The study therefore opts to examine human capital development and industrial sector growth in Nigeria from 1986 to 2020. This paper differs from previous works based on the addition of other variables to depict human capital apart from education and health. This paper is organized as follows: Apart from section one which is the introduction, section 2 considers empirical literature. Section three stipulates the methodology; section four is the analysis and discussion of results while section five is the conclusion and recommendations

LITERATURE REVIEW

Concept of Human Capital Development

Human capital refers to abilities and capabilities of individuals, whereas human capital formation refers to the process of obtaining and expanding the number of people with skills, education and experience necessary for a country's economic growth and development. For this purpose, effective human capital investment is critical to increased national productivity and long-term economic growth (Okumoko et al., 2018).

The quality of human resources available in a country determines the economic performance of the country. Human beings play essential functions. They are the most dynamic of all economic agents as they help in accumulating capital, utilizing natural, economic and political resources towards economic progress (Sedat & Mesut, 2016). Thus, human capital influences economic growth through: (a) increased labour productivity, which increases output; (b) increased labour demand, which leads to increase in output as the number of employed workers increases; and (c) increased human capital stock, which attracts physical capital from other countries.

Okochi and Ateke (2021) suggests it is essential to develop employees (human capital) because they constitute the organizational resource that determine efficiency and effectiveness, and inform success of organizations. Human capital has two components: education and health. Health improves effectiveness of human capital, while education enhances the quality of human capital. The health component supports the other element of human capital, being healthy sets the ground for educational attainment.

Human Capital Development and Industrial Growth

The role of human capital development on industrial growth is evidenced by empirical results and anecdotes. Developing human capital at workplaces creates proactive and self-sufficient employees that assist firms to achieve their goals (Herrenkohl et al., 1999, as cited in Okochi & Ateke, 2021). Highly developed employees take initiatives, they are productive and produce quality output.

Okumoko et al. (2018) studied dynamics of human capital development and industrial growth in Nigeria, using time series data spanning 1976-2016. Relevant variables were analyzed using econometric techniques. The results show that recurrent education and health expenditures have a negative influence on industrial growth. Popoola et al. (2019) on their part studied human capital channels and productivity growth in Nigeria, from 1980 to 2017 using the Vector Error Correction Model to examine the joint short- and long-run causality, as well as long-run behaviour of human capital channels on productivity. The results of the joint short-run and long-run causality demonstrate that there is no long-run causation, but joint short-run causality was observed in the basic channel, while both joint short- and long-run causality were detected in the advanced channel.

Similarly, Sajjad et al. (2019) examined the relationship between knowledge-based economy and economic growth in MENA countries, using the GMM-DIFF robust two-step estimation techniques from the period 2010 -2015. Institutions, human capital and research, infrastructure, and business sophistication were seen as the pillars of a knowledge-based economy, as they were found to have significant and positive economic growth in MENA nations.

Obasanjo and Idogun (2020) investigated influence of human capital development on real-sector growth in Nigeria, utilizing time series data spanning 1990 to 2018 and the Error Correction Mechanism (ECM). The outcome of the Johansen co integration test reveals that there is a long-term relationship between human capital development and production growth in the two sectors studied. The study found that government spending on education and health resulted increased output of Nigeria's oil and gas sector, but not the agricultural sector.

Xuewei et al. (2020) studied effect of government healthcare expenditure on economic growth in 31 provinces in China gathered from 2005 to 2017, the panel data were analyzed by constructing a spatial Durbin model, and the result from the analysis shows that Government healthcare expenditure in China significantly and positively affects economic growth under three spatial weight matrices. In the study of Saka and Olanipekun (2021), which examined the role of human capital in the relationship between industrialization and growth in Nigeria from 1980 to 2016, it was shown that industrialization is germane to economic growth; and that literacy rate complement the industrial process to improve growth.

Also, Saheed et al. (2021) examined public health expenditure and economic growth in Nigeria from 2000 to 2016 using Autoregressive distributed lag estimation techniques. The study reports that the existence of a long-run relationship between public health expenditure and economic growth. The study also found that, while there is no causal relationship between public health expenditure and GDP, there is evidence of long-run association between the two.

James (2021) studied the relationship between human capital development, national security and agricultural sector growth in Nigeria from 1981-2017. The Autoregressive Distributed Lag model was used to estimate the relationship between the variables. The investigation discovered that there is no long-term link between the variables. Furthermore, Ethem and Merve (2021) assessed effects of health spending on economic growth in Turkey. The results of the study suggest existence of co integration between the variables in the long-term, and a short-term unidirectional causality between health expenditure and economic growth in the short-term.

Theoretical framework

The Endogenous growth theory underpinned this study. Economic growth could be sustained indefinitely in endogenous models because returns on investment in a broad class of physical and human capital goods do not necessarily reduce over time. Knowledge spillovers among producers and external benefits from increased human capital are both parts of this process since they counteract diminishing returns. Growth frameworks also incorporate research and development concepts, as well as imperfect competition (Romer, 1986; Barro & Sala-I-Martin, 1995). A large number of endogenous growth specifications have been put forward. A typical specification for analyzing growth across several countries follows Barro (1997):

$$\Delta y = f(y, y^*) \quad (1)$$

$$y^* = f(Z) \quad (2)$$

Where Δy is the growth rate per capita output, y is the current level of per capita output and y^* is the long-term or steady-state level of per capita output. For a given value of y, the growth rate rises with y^*, which is determined by a wide set of economic policy and environmental variables. These factors vary per study, but Z in equation (2) often includes variables that measure population (fertility and life expectancy), labour supply, government expenditure and investment, terms of trade, inflation, and, most importantly for this paper, educational variables.

The following sections explore measurement challenges related to educational variables. According to Barro (1997), any increase in the steady-state level y* will raise the per capita growth rate, y, over a transition period in this model. So, if government, for example, improves the business climate by raising spending or decides to increase education investment by increasing secondary school enrolment rates, the target level y* will rise and y will rise. As actual per capita output rises, diminishing returns will eventually bring the growth rate back to the long-term pace of technological progress. The improved policy has a long-term impact on the level of per capita output rather than just its growth rate. Long-term transitions, on the other hand, can take a long time, and the growing impacts of changes in government policy could last a long time.

METHODOLOGY

This study employed an ex-post facto research design because data pertaining to the variables of interest are sourced from secondary sources over some time. The data for the study are sourced from the Central Bank of Nigeria (CBN) statistical bulletins and various editions the World Bank Development Indicators (WBDI) data covering 1986 to 2020. The first process in the estimation procedure was to perform certain diagnostic tests on the data obtained for empirical analyses, which are the descriptive statistics, correlation test, unit root and co-integration tests.

The study adopted Auto-Regressive Distributed Lag (ARDL) model-bound testing approach (Dickey & Fuller, 1979). This model was developed by Pesaran et al. (2001) an OLS model which is applicable to both non-stationary time series as well as time series with mixed order of integration. It helps in predicting current values of a dependent variable based on current values as well as lagged values of explanatory variables. The method helps to take care of the problem of drifting series and equally enables us determine both short-run and the long-run relationship of the model (Ahmed et al., 2011). The ARDL approach, developed by Pesaran et al. (2001), was chosen over the conventional Engle and Granger (1987) and Johansen and Juselius (1990) approach for a long-run test (co integration) as a result of its advantages over them.

After the ARDL estimation, the test for autocorrelation and heteroscedasticity was conducted. The Breusch-Godfrey Test is used to test for autocorrelation above the Durbin-Watson statistics. The Durbin-Watson Test is restricted to detecting first-order autoregression; the Breusch-Godfrey (BG) Test could detect autocorrelation up to any predesignated order. It also supports a broader class of regressors. Similarly, the Jarque Bera test was carried out to ascertain the normality of the residue series of the parameter estimate. Stability test was carried out as the Cusum and Cusum of Square Test for the stability and robustness of the model. The Granger causality test is a statistical hypothesis test for determining whether one time series is a factor and offers useful information in forecasting another time series. Similarly, the Wald causality test was conducted to ascertain the nature of relationship among the variables.

Model Specification

This paper established an econometric model to demonstrate the linkage between human capital development and growth in Nigeria's industrial sector. In evaluating the connection between the variables by incorporating the Autoregressive distributed lag (ARDL), the following linear specifications are shown below:

$$INDL = F(INDL, MR, GOVEDU, GOVHLT, LFR) \quad (1)$$

Specifying in econometric terms and taking logarithm where large variables are expected, to avoid the problem of extremely large variable coefficient, the model is re-specified as thus:

$$LINDL = \alpha_0 + \alpha_1 INDL + \alpha_2 MR + \alpha_3 LGOVEDU + \alpha_4 LGOVHLT + \alpha_5 LFR + \mu_t \quad (2)$$

From the foregoing, the Autoregressive Distributed Lag form of the version of the estimated model for the paper is estimated as follows:

$$D(LINDL)_t = \beta_0 + \gamma t + \alpha_0 INDL_{t-1} + \alpha_1 MR_{t-1} + \alpha_2 LGOVEDU_{t-1} + \alpha_3 LLGOVHLT_{t-1}$$
$$+ \alpha_5 LFR + + \sum_{i=0}^{p} \pi i D(SSE)_{t-1} + \sum_{i=0I}^{q} \pi i D(MR)_{t-1} \sum_{i=0}^{r} v i D(LGOVEDU)_{t-1} + \sum_{i=0}^{s} \tau i \quad (3)$$
$$D(LGOVHLT)_{t-1} + \sum_{i=0}^{u} \rho i D(LFR)_{t-1} + \kappa t$$

Where: INDL= Industrial sector, SSE=Secondary school enrollment, GOVEDU=Government expenditure on education, GOVHLT=Government expenditure on health, LFR=Labour force and MR= Infant mortality rate.

The D is the first difference operator; t is the years 0; p, q, r, s, and u are the maximum lag orders, and κt is the error term.

ANALYSIS AND DISCUSSION OF RESULTS

Table 1: Descriptive statistics for variables employed in the model

	INDL	GOVEDU	GOVHLT	LFR	MR	SSE
Mean	9761.997	92.54093	154.3326	59.34143	101.1514	35.63829
Median	3525.141	34.20000	76.50000	59.99000	100.8000	33.85099
Maximum	43530.78	388.3671	593.4385	62.93626	124.8000	56.20540
Minimum	65.04538	0.041315	0.225005	53.91000	72.20000	23.55180
Std. Dev.	11973.45	115.3454	181.3858	2.450659	19.18792	8.647285
Skewness	1.336526	1.147143	1.054648	-0.894483	-0.032585	0.535027
Kurtosis	3.926676	3.140648	2.892593	2.815400	1.389678	2.303464
Jarque-Bera	11.67241	7.705151	6.505140	4.716943	3.787853	2.377344
Probability	0.002920	0.021225	0.038675	0.094565	0.150480	0.304625
Sum	341669.9	3238.932	5401.641	2076.950	3540.300	1247.340
Sum Sq. Dev.	4.87E+09	452355.4	1118627.	204.1948	12517.99	2542.368
Observations	**35**	**35**	**35**	**35**	**35**	**35**

Source: Author's compilation from Eviews version 10.

The summary statistics of the variables under investigation are presented in Table 1. The mean of each variable indicates the average of the respective variable used while the standard deviation revealed how dispersed the distribution is from its average, thus it shows the volatility and explosiveness of the variable.

Furthermore, the skewness and kurtosis values indicate asymmetry and peakedness of the distribution. All the variables in Table 1 are positively skewed except, LFR and MR. From the result also, only INDL and GOVEDU were found to be normally distributed i.e. Mesokurtic. GOVHLT, SSE rate, LFR, and MR were observed to be lower than the kurtosis value, suggestive of platykurtic distribution. The Jarque-Bera test as well as the corresponding probability value shows that INDL, GOVEDU, and GOVHLT were the only normally distributed variables, given their probability values.

Analysis of the Pairwise Correlation Statistics

The Correlation matrix is presented in the table below, the result reveals the pairwise relationship among the variables, and this tends to reveal the presence of multicollinearity.

Table 2: Correlation Matrices for Industrial Sector Model

	INDL	GOVEDU	GOVHLT	LFR	MR	SSE
INDL	1	0.68	0.68	-0.77	-0.86	0.85
GOVEDU	0.68	1	0.69	-0.79	-0.87	0.85
GOVHLT	0.68	0.69	1	-0.81	-0.89	0.87
LFR	-0.77	-0.79	-0.81	1	0.80	-0.78
MR	-0.86	-0.87	-0.89	0.80	1	-0.84
SSE	0.85	0.85	0.87	-0.78	-0.84	1

Source: Author's compilation from Eviews version 10.

In Table 2, the explanatory variable of equation 3, INDL model is tested for the presence of multicollinearity, the result shows that GOVEDU has a positive relationship with INDL, the two variables were not highly positively correlated. GOVHLT and GOVEDU are also positively related, but the relationship is not significant. GOVEDU posted a negative relationship with both LFR rate and MR rate. GOVEDU however posted positive relationship with SSE rate. LFR and MR were also seen to have a positive relationship. LFR rate and SSE rate were seen to have a high negative relationship. Lastly, MR and SSE rate have a high negative relationship. From the relationships that exist between the explanatory variables none of the variables was seen to be perfectly correlated or nearly perfectly correlated hence we can conclude that there is no multicollinearity in the model.

Unit Root Test

The unit root test is the test for the stationarity of the variables used in the models. In testing for a unit root in the study, The Augmented Dickey-Fuller (ADF) test was adopted. The result is presented in Table 3.

Table 3: Unit Root Test for Variable in Level

Variable	ADF Test Statistic	ADF Critical Values (5% level)	Remark
INDL	1.590988	-4.309824	Non-stationary
GOVEDU	0.631048	-3.587527	Non Stationary
GOVHLT	-0.935553	-3.548490	Non Stationary
MR	-8.416913	-3.552973	Stationary
LFR	-3.885764	-3.562882	Stationary
SSE	-2.618742	-3.548490	Non-stationary

Source: Author's compilation from Eviews version 10.

Table 3 presents the Augmented Dickey-Fuller (ADF) test result for a unit root in the selected variable in levels. The result was based on a 5% significant level. From the results, INDL, GOVEDU, GOVHLT, and SSE all have a unit root. This shows that none of the above-listed variables was stationary in levels. MR and LFR were seen to have no unit root; hence they are stationary at levels.

Table 4: Unit Root Test for Variable in First Difference

Variable	ADF Test Statistic	ADF Critical Values (5% level)	Remark
INDL	-6.939180	-3.574244	stationary
GOVEDU	-3.934693	-3.587527	Stationary
GOVHLT	-4.476065	-3.574244	Stationary
MR	-6.252032	-3.552973	Stationary

Source: Author's compilation from Eviews version 10.

Table 4 presents the Augmented Dickey-Fuller (ADF) test result for a unit root in the selected variables in the first difference. The result was based on a 5% significant level. From the result, INDL, GOVEDU, GOVHLT, and MR are integrated of Order I(1) i.e. they are integrated at first difference.

Bound test for Co integration

The autoregressive distributed lag (ARDL) bounds test of co integration of the model specified in this study is given in Table 5. In the bounds test of co integration, a null hypothesis of no co integration among the variables in a model is rejected if the F-statistic is greater than the 5 per cent upper bound value.

Table 5: ARDL Bounds Test of Co integration Results

Model	5% Lower Bound	5% Upper Bound	F Statistic	Degree of Freedom
INDL	2.39	3.38	8.31	5

Source: Author's compilation from Views version 10.

The result in Table 5 indicates that there was no co integration among variables in the Industrial sector model. The F-statistic value was 8.31 which was also greater than the 5 per cent critical value of 3.38. This suggested that a null hypothesis of no co integration among variables in the Industrial sector model was rejected. Similarly, the existence of a long-run relationship was established.

Optimal Lag Length Selection for ARDL Models

The result of the optimal lag selection was adequate for the estimation of the ARDL models using different selection criteria. The selection criteria were sequential modified LR test statistic (each test at a 5% level), final prediction error (FPE), Akaike information criterion (AIC), Schwarz information criterion (SIC), and Hannan-Quinn information criterion (HQ). Hence the Akaike information criterion (AIC) will be used for the lag selection criteria for this model

Table 6: Optimal Lag Length Selection for the Industrial Sector Model

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-6.044478	NA	0.124854	0.752780	1.027605	0.843877
1	14.00974	31.33471*	0.038052	-0.438109	-0.117479*	-0.331829
2	14.35027	0.510803	0.039798	-0.396892	-0.030458	-0.275430
3	17.01240	3.826803	0.036042*	-0.500775*	-0.088537	-0.364129*

Source: Author's compilation from Eviews version 10.

Table 6 also displayed the results of the various lag selection criteria for the Industrial sector model. From the Table, The Aikaike lag selection criteria indicated that the optimal lag length for this model was three lag. The result suggested that the Industrial sector model was estimated using an optimal lag length of three in the ARDL estimation.

Table 7: Estimated Short-Run Result of Industrial Sector Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LNINDL(-1))	0.306496	0.100374	3.053549	0.0065
D(LFR)	0.182480	0.031535	5.786674	0.0000
D(LNGOVEDU)	-0.167537	0.079174	-2.116070	0.0478
D(LNGOVEDU(-1))	-0.213829	0.042060	-5.083877	0.0001
D(LNGOVHLT)	0.211135	0.072161	2.925901	0.0087
D(SSE)	0.009404	0.005384	1.746537	0.0969
D(SSE(-1))	-0.016578	0.005665	-2.926423	0.0087
CointEq(-1)*	-0.616834	0.070472	-8.752925	0.0000

Source: Author's compilation from Eviews version 10.

The result of the industrial sector model is given in Table 7. From the result, the first lag of the industrial sector is seen to be positive and significant in its contribution to industrial sector growth. LFR which showed a significant and positive impact on industrial sector growth in the short-run, has a 1% increase in LFR. It leads to an 18% increase in industrial sector growth in the short run. GOVEDU was seen to have a negative and significant impact on industrial sector growth as a 1% increase in GOVEDU leads to a

17% decrease in industrial sector growth, also the first lag of GOVEDU shows that one per cent increase in GOVEDU leads to 21% fall in industrial sector growth in the short-run. GOVHLT in the short run was seen to have a positive but insignificant impact on industrial sector growth. SSE rate in the short run was seen to have a positive but insignificant effect on industrial sector growth. However, its first lag was seen to have a negative and significant impact on industrial sector growth in the short run. The Coefficient of the error correction term is negative (correctly sign) and its shows that 62% of previous year's shocks in the industrial sector is offset every 12 months.

Table 8: Estimated Long-Run Result of Industrial Sector Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LFR	0.081771	0.038515	2.123093	0.0471
LNGOVEDU	0.813561	0.207541	3.919994	0.0009
LNGOVHLT	-0.148967	0.205556	-0.724704	0.4775
MR	0.010327	0.009595	1.076245	0.2953
SSE	0.057941	0.012715	4.556859	0.0002
C	-1.363216	2.932357	-0.464888	0.6473

Source: Author’s compilation from Eviews version 10.

The result of the long-run industrial sector model is shown in Table 8. From the result, LFR in the long run has a positive and significant impact on industrial sector growth. 1% increase in LFR led to 8% increase in industrial sector growth. GOVEDU showed positive significant impact on industrial sector growth. 1% increase in GOVEDU, in the long run, led to 80% increase in industrial sector growth. GOVHLT has a negative insignificant impact on industrial sector growth. Also, the MR showed positive insignificant impact on industrial sector growth in the long run. SSE rates have a positive and significant impact on industrial sector growth, as 1% increase in the SSE rate lead to 6% increase in industrial sector growth in the long run.

Table 9: Diagnostics result of Estimated Industrial Sector Model

Test	F Stat	DF	Prob.
Breusch-Godfrey Serial Correlation LM Test	1.4148461	F(2,17)	0.2702
Heteroskedasticity Test: Breusch-Pagan-Godfrey	0.639093	F(13,19)	0.7935

Source***:*** Author’s compilation from Eviews version 10.

Diagnostics of the estimated Industrial sector growth model are displayed in Table 9. The estimated model had a residual series that had no serial correlation. This was revealed by the Breusch-Godfrey Serial Correlation LM Test F-statistic value of 1.415, which was not significant at 5%. It meant that a hypothesis of no serial correlation in the residual series cannot be rejected. Hence there is no serial correlation in the model since the probability value of 27% is greater than the 5% level of significance. The Breusch-Pagan-Godfrey heteroskedasticity test showed that the F-statistic value 0.639 was not significant. As the probability value is 75% greater than the 5% level of significance. This implied that there was no problem of heteroskedasticity in the Industrial sector model estimated.

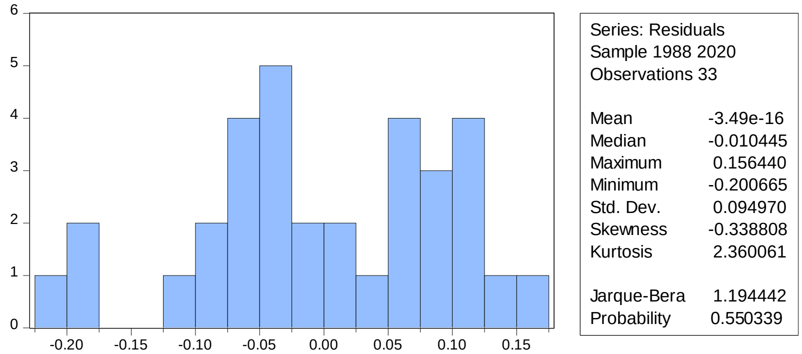

Fig. 1: Normality test for the Industrial sector model
Source: Author's compilation from Eviews version 10.

The residual normality test of the estimated Industrial sector was displayed in Fig. 1, and the Probability value of 0.550 which is greater than the 5% level of significance shows that the residuals are normally distributed.

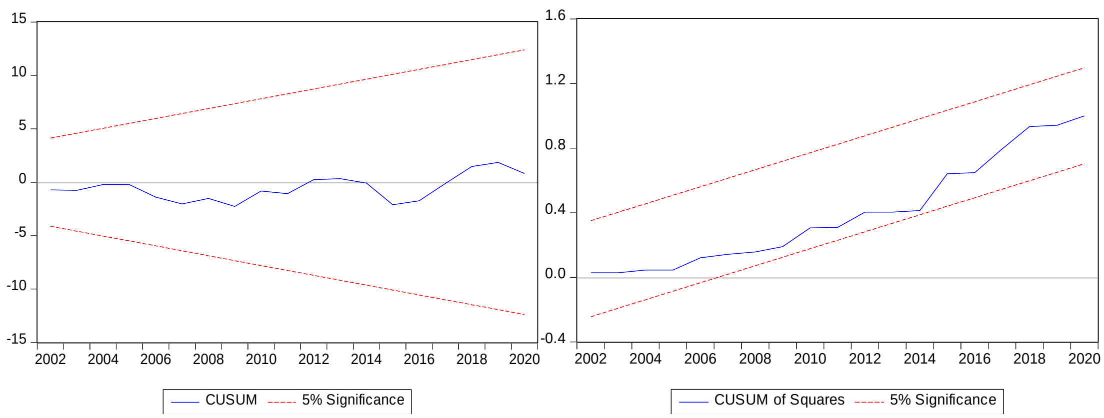

Fig. 2: Stability test for industrial sector model
Source: Author's compilation from Eviews version 10.

Fig. 2 shows the stability test for the industrial sector model, the result from the Cumulative Sum and Cumulative sum of The Square of Recursive Residuals (Cusumsq) Tests for the industrial sector model, we observed that the coefficients of the industrial sector growth model are stable because the blue line usually lies between both red lines. Hence, we can say that our estimated models are stable. Hence, our findings are robust and inferences drawn from this model can be relied upon.

CONCLUSION, RECOMMENDATIONS AND POLICY IMPLICATION

The role of human capital development in promoting industrial sector growth in Nigeria has been theoretically and empirically acknowledged and emphasized in literature. It is on this note that the impact of different components of human capital development was analyzed in the industrial sector. The Coefficient of the error correction term is negative (correctly signed) and its shows that 38% per cent of the previous year's shocks in the industrial sector is offset every 12 months in the short run.

Considering the significant relationship between the industrial sector, and the variables employed in the study. The study therefore, calls for proper investment in human capital development through increment in budgetary allocation to education and health, to bring about the needed growth in the industrial sector of the Nigerian economy.

Based on the estimation results of the industrial sector growth, the government's recurrent investment secondary school enrolment rate indicated that government expenditure on education in the short-run had a significant negative impact on industrial sector growth, while in the long run, there is significant positive impact. Government recurrent expenditure on health and infant mortality rate revealed that government's overall expenditure on health in the short run had a significant impact on the industrial sector growth while in the long run with a negative impact.

The implication of this on the industrial sector is that for the desired level of industrial sector growth to be achieved, investment in education should be increased by government policy. On the whole, the policy implication of this is the need to increase human capital formation through deliberate investment in education and health to achieve desired level of industrial sector growth in Nigeria.

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