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Human Capital, Trade Openness and Economic Growth in Nigeria

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Abstract
The study investigated the effect of human capita and trade openness on economic growth in Nigeria. The time series data was used for the study, which variables include gross domestic product growth proxied economic growth, net export, real exchange rate, foreign direct investment, total government expenditure on education, trade openness, primary school enrolment and life expectancy which spans from 1986 to 2020. These data were sourced from Central Bank of Nigeria, World Development Indicator (2021). The study adopted error correction model (ECM) as an estimating technique to explain the effect of the nexus. However, the results of Ordinary Least Square estimation of the ECM suggests that there is positive and statistically significant between trade openness, primary school education and foreign direct investment and economic growth while total government expenditure on education, real exchange rate, and net export have negative and insignificant impact on economic growth. The study therefore concludes with recommendations that government should reduce rate of importation, encourage export, invest more in education, encourage foreign investors and equally adopt a workable policy that will stabilize macroeconomic variables.

Keywords: Human Capital, Trade Openness, Economic Growth
JEL Classification: E24; F13; F43

1. Introduction

Human capital and trade openness are two catalysts that drive and enhance every country's growth and development of any nation. Hence, it stimulates the performance of the economy's activities, if attention is drawn toward it. For instance, during the severe covid-19 crisis that crumbled the world economy lately in which Nigeria was

seriously affected economically. Thus, human capital and trade openness are very consequential as opined by Nelson and Phelps (1966) that the absorbent capacity and adoption of new innovation backing the idea of raising the effect of trade openness on the growth and development of the economy. More so, human capital is engendered through formal of education and training at the same time informal learning channels. Therefore, it is highly impossible to actually measure the full dimension of the human capital.

Owing to this fact, literature incarcerates to measuring years of schooling in the population and of course the outcome is tantamount to human capital as postulated by Haouas and Yagoubi (2005). On the other hand, trade openness on economic development globally speaking has been momentumly gaining territory for some decades now (Keho, 2017a). This assertion actually concurred by the scholars such as Pan, Uddin, Han and Pan (2019) and Keho (2017b), in which they opined that economic growth and financial development come as a result of trade openness, which also equally permits for effective resources allocation, easier access to commodities and services, and as well easier attainment of aggregate factor productivity across border.

Consequently, human capital and trade openness are the central point influencing monetary development. It does not just incorporate purchasing and selling of labour and products, yet it likewise assists with growing new advances, streams of novel thoughts and information. More so, most important fact about the relationship between trade openness and human capital is that they both drive growth in Nigeria because Nigeria economy is majorly of primary production. Nigeria economy has experienced low performances because of colonization, political instability and corruption among others (Nduka, Chukwu, Ugbor and Nwakaire (2013). In Nigeria, there has not been diversification on its export-base in order for the oil sector to have dominance on almost all the merchandise exportations so that over 70 percent could be contributed to her total foreign earnings (Nduka, 2013).

Numerous scholars have observed the trade openness that undoubtedly affects the growth of the economy in a different way as such; accumulation of capital, equality of factor prices among countries, transfer and acquisition of knowledge and technology. These factors were been added that knowledge and technology transfers are the products of human investment according to Kerebana and Krama (2021). In the light of Grossman and Helpman (1991), which were of opinion that when there is openness to other countries through international trade leads to increase in the quality and quantity of human capital through new innovation, transmission of knowledge, learning doing hitherto, these were lacking among the least developed countries with the

tendency of inducing specialization in production line which in turns lead to the growth of the economy.

The aim of this research work is to examine the effect of trade openness and human capital on economic growth and simultaneously to determine their causality linkage. Hence, so many studies have been investigated in favour or against human capital and trade openness as a way of enhancing the growth of the economy.

2. Review of Related Literature

The causes of trade openness in transitional economies are investigated by Balavac and Pugh (2016). The analysis was predicated on the fact that FDI and human capital development complement each other in terms of trade openness. The study used dynamic generalized moments methods (GMM). Secondary data from 1996 to 2010 was used. Human capital development, in combination with FD, economic growth, and mining sector growth, was found to have a considerable favorable impact on trade openness in transitional economies, according to the findings.

Obi and Obi (2014) zeroed in on the effect of instruction use on financial development as a method for accomplishing the ideal financial change required in Nigeria utilizing time series information from 1981 to 2012. The Johansen's co-incorporation examination and conventional least square (OLS) econometric procedures were utilized to dissect the connection between total national output (GDP) and repetitive training consumption. Discoveries demonstrate that however a positive relationship stays alive between schooling use and monetary development, yet a since quite a while ago run relationship doesn't exist over the period under study. They recommend the improvement of the training framework through productive utilization of public assets through great administration, responsibility and straightforwardness. Likewise, endeavors ought to be made by strategy producers to concoct approaches that would check, safeguard and secure the situation of instructive cash-flow to different nations.

Ajadi and Adebakin (2014) inspected human capital development as associate of financial development in Nigeria, the spellbinding study research was embraced and multi-stage testing method was utilized to choose an aggregate of 200 respondents utilized for the review. An embraced survey with 0.86 unwavering quality record was utilized for information assortment. Information gathered were dissected utilizing the Pearson's Product Moment Correlation Coefficient. The discoveries showed that training has a prescient R-worth of 0.76 on individual pay and the idea of work (business) is identified with individual pay (r=0.64). It hence, inferred that monetary

development is an element of individual pay level and suggested that administration ought to foster fitting instructive arrangement to give the human resources need of the general public for financial development.

In experimental investigation, Baltagi, Demetriades and Law (2009); Barro (1991); Levine and Renalt (1992) reason that the pace of actual capital development impacts the pace of a country's financial development. Conversely, King and Levine (1993) noticed that the development of capital alone does not prompt financial success, rather the proficiency in apportioning capital from less useful to more useful areas impact monetary development.

Ojeyinka and Adegboye (2017) fostered a synchronous condition model to catch the joint impact of trade openness on farming and assembling areas in Nigeria. Utilizing a summed up strategy for second procedure, they uncovered that exchange receptiveness applies a positive and huge effect on the yield of the horticultural commodity, while a huge negative relationship exists between exchange transparency and assembling yield Nigeria, the specialist embraces this work since farming item is currently one of the primary wellspring of Nigeria product and it additionally influences send out without likewise peering down on its commitment on human asset advancement for it presently has organizations of discovering that presently creates specialists on this field.

Khobai and Chitauro (2018) investigated the impact of trade liberalisation on the growth economy in Switzerland, using annual data which spans from 1990 to 2014. ARDL model was adopted as an estimating technique to test for long run among the used variables for the study. It was found out that trade openness is positive and statistically significant and the study concluded that there is need for Switzerland to more effect in exportation of goods so as to compensate the importation.

Amna, Yaseen, Kousar, Usman and Makhdum (2020) conducted a comparative study of Asian nations to examine the effects of trade openness and human capital on economic growth. The panel data covers the years 1985 through 2017. To examine long-term coefficients between the variables, both modified ordinary least square and dynamic ordinary least square models were used. Further, the direction of causality was examined using the Dumitrescu and Hurlin causality test. In Southern Asia throughout the study period, it was discovered that labour force had a negative impact on economic growth whereas trade openness and human capital had a significant and favourable link. Finally, it was demonstrated from the findings that there is a unidirectional causal relationship between human capital and the growth of the economy. It was also noted from the findings that foreign direct investment is

inversely and statistically significant related to economic growth in the region.

The effect of trade liberalisation on economic growth in Switzerland was studied by Khobai and Chitauro (2018). The time series data ranged from 1990 to 2014. The ARDL model was also used in the study as an estimating method. The study's findings showed a long-term relationship between the factors examined, with trade openness having a statistically significant beneficial impact on economic growth.

However, quite a number of previous studies focused on the impact of trade openness human capital on economic growth mainly either liberalization, farming or trade openness in transitional economies. Also, the dominance of the historical time series data used differs from previous studies as this study covers a period from 1986 to 2020. More so, the study used the following variables; real gross domestic product, net export, real exchange rate, foreign direct investment, total government expenditure on education, trade openness, primary enrolment education and life expectancy of interest in which none of the previous studies had used, as such this study is considered to be more revealing compared to previous studies carried by other scholars. By implication, this study will be providing a concrete and effective analysis with respect to the effect of human capital and trade openness on economic growth in Nigeria.

3. Theoretical Framework and Methodology

3.1 Theoretical Framework

The underpinning theory for this study is Heckscher-Ohlin hypothesis and it is explicitly explanation goes thus. The theory discusses the features of varieties among nations which provides the provisions of conglomeration classes of usable variables which was created by two financial experts (Swedish) namely Heckscher and Ohlin in the year 1930. Their models therefore have been strained out in this survey work. In the light of this, the two nations that have different gifts of the fundamental elements of production but share a comparable overall innovation may nonetheless determine that reorganised trade in goods forces pay rates in the two countries into complete fairness.

3.2 Model Specification

The data used for this study covered between 1986 to 2020. Thus, the choice for 1986 as the starting year and 2020 as end is actually based on data availability from the source, that is, Central Bank of Nigeria and World Development Indicators (2021). Thus, in order to investigate the effect of human capital and trade openness on economic

growth in Nigeria, a model anchored on the theory as used by Amna et al., (2020) is adapted as follows:

$$GDPG = f(HC, UPOP, TPOP, LFP, TO, FDI) \quad (1)$$

Where, GDPG stands for Gross Domestic Product per capita, HC represents tertiary education, UPOP represents urban population, TPOP represents total population, LFP represents labour force participation, TO represents trade openness, while foreign direct investment and trade openness. Thus, the model is remodified as follows;

$$RGDP_t = f(XN, REER, FDI, TGEE, TOP, PSE, LE) \quad (2)$$

Where, RGDP = real gross domestic product, NX represents net export, REER represents real exchange rate, FDI represents foreign direct investment, TGEE represents total government expenditure on education, TOP represents trade openness, PSE represents primary enrolment education while PE represents life expectancy.

$$RGDP_t = \delta_0 + \delta_1 XN_t + \delta_2 REER_t + \delta_3 FDI_t + \delta_4 TGEE_t + \delta_5 TOP_t + \delta_6 \mathrm{PSE}_t + \delta_7 \mathrm{LE}_t + \mu_t \quad (3)$$

Where: δ_0 denotes Intercept

$\delta_1 - \delta_7$ indicate coefficient or slope of the explanatory variables.

μ means white noise error term.

Concisely, the model is rewritten in a log-linear form to transform the variables into the same unit and base. Thus equation (3) becomes:

$$LRGDP_t = \delta_0 + \delta_1 LNX_t + \delta_2 LREER_t + \delta_3 LREER_t + \delta_4 LFDI_t + \delta_5 LTGEE_t + \delta_6 L\mathrm{TOP}_t + \delta_7 \mathrm{LPSE}_t + \delta_7 \mathrm{LLE}_t + \mu_t \quad (4)$$

Where: L represents the natural log of the variables. This is necessary in order to avoid large fluctuation in the variables. All other variables remain as defined above. On a-priori

$$\delta_{0>0}, \delta_{1<0}, \delta_{2<0}, \delta_{3<0}, \delta_{4<0}, \delta_{5<0}, \delta_{6<0}, \delta_{7<0}$$

In this study, the granger causality model is based on:

$$\Delta LnRGDP_t = +\sum_{j=1}^{n}\alpha_{ij} LnRGDP_{t-1} + \sum_{j=1}^{n}\alpha_{ij} LnNX_{t-j} + \sum_{j=1}^{n}\alpha_{ij}\Delta LnREER_{t-j} + \sum_{j=1}^{n}$$

$$+\sum_{j=1}^{n}\alpha_{ij} LnTGEE_{t-j} + \sum_{j=1}^{n}\alpha_{ij} LnTOP_{t-j} + \sum_{j=1}^{n}\alpha_{ij} LnPSE_{t-j} + \sum_{j=1}^{n}\alpha_{ij} LnLE_{t-j} + \xi_{1t}$$

$$\Delta LnNX_t = +\sum_{j=1}^{n}\alpha_{ij} LnNX_{t-1} + \sum_{j=1}^{n}\alpha_{ij} LnRGDP_{t-j} + \sum_{j=1}^{n}\alpha_{ij}\Delta LnREER_{t-j} + \sum_{j=1}^{n}\alpha_{ij} LNFDI_{t-j}$$

$$+\sum_{j=1}^{n}\alpha_{ij} LnTGEE_{t-j} + \sum_{j=1}^{n}\alpha_{ij} LnTOP_{t-j} + \sum_{j=1}^{n}\alpha_{ij} LnPSE_{t-j} + \sum_{j=1}^{n}\alpha_{ij} LnLE_{t-j} + \xi_{2t} \quad (6)$$

$$\Delta LnREER_t = +\sum_{j=1}^{n}\alpha_{ij} LnREER_{t-j} + \sum_{j=1}^{n}\alpha_{ij} LnRGDP_{t-j} + \sum_{j=1}^{n}\alpha_{ij}\Delta LnNX + \sum_{j=1}^{n}\alpha_{ij} LNFDI_{t-j}$$

$$+\sum_{j=1}^{n}\alpha_{ij} LnTGEE_{t-j} + \sum_{j=1}^{n}\alpha_{ij} LnTOP_{t-j} + \sum_{j=1}^{n}\alpha_{ij} LnPSE_{t-j} + \sum_{j=1}^{n}\alpha_{ij} LnLE_{t-j} + \xi_{3t} \quad (7)$$

$$\Delta LnFDI_t = +\sum_{j=1}^{n}\alpha_{ij} LnFDI_{t-j} + \sum_{j=1}^{n}\alpha_{ij} LnRGDP_{t-j} + \sum_{j=1}^{n}\alpha_{ij}\Delta LnNX + \sum_{j=1}^{n}\alpha_{ij} LnREER_{t-j}$$

$$+\sum_{j=1}^{n}\alpha_{ij} LnTGEE_{t-j} + \sum_{j=1}^{n}\alpha_{ij} LnTOP_{t-j} + \sum_{j=1}^{n}\alpha_{ij} LnPSE_{t-j} + \sum_{j=1}^{n}\alpha_{ij} LnLE_{t-j} + \xi_{4t} \quad (8)$$

$$\Delta LnTGEE_t = +\sum_{j=1}^{n}\alpha_{ij} LnTGEE_{t-j} + \sum_{j=1}^{n}\alpha_{ij} LnRGDP_{t-j} + \sum_{j=1}^{n}\alpha_{ij}\Delta LnNX + \sum_{j=1}^{n}\alpha_{ij} LnREER_{t-j}$$

$$+\sum_{j=1}^{n}\alpha_{ij} LnFDI_{t-j} + \sum_{j=1}^{n}\alpha_{ij} LnTOP_{t-j} + \sum_{j=1}^{n}\alpha_{ij} LnPSE_{t-j} + \sum_{j=1}^{n}\alpha_{ij} LnLE_{t-j} + \xi_{5t} \quad (9)$$

$$\Delta LnTOP_t = +\sum_{j=1}^{n}\alpha_{ij} LnTOP_{t-j} + \sum_{j=1}^{n}\alpha_{ij} LnRGDP_{t-j} + \sum_{j=1}^{n}\alpha_{ij}\Delta LnNX + \sum_{j=1}^{n}\alpha_{ij} LNREER_{t-j}$$

$$+\sum_{j=1}^{n}\alpha_{ij} LnFDI_{t-j} + \sum_{j=1}^{n}\alpha_{ij} LnTGEE_{t-j} + \sum_{j=1}^{n}\alpha_{ij} LnPSE_{t-j}\sum_{j=1}^{n}\alpha_{ij} LnLE_{t-j} + \xi_{6t} \quad (10)$$

$$\Delta LnPSE_t = +\sum_{j=1}^{n}\alpha_{ij}LnPSE_{t-j} + \sum_{j=1}^{n}\alpha_{ij}LnRGDP_{t-j} + \sum_{j=1}^{n}\alpha_{ij}\Delta LnNX + \sum_{j=1}^{n}\alpha_{ij}LNREER_{t-j}$$
$$+\sum_{j=1}^{n}\alpha_{ij}LnFDI_{t-j} + \sum_{j=1}^{n}\alpha_{ij}LnTGEE_{t-j} + \sum_{j=1}^{n}\alpha_{ij}LnTOP_{t-j} + \sum_{j=1}^{n}\alpha_{ij}LnLE_{t-j} + \xi_{7t} \quad (11)$$

$$\Delta LnLE_t = +\sum_{j=1}^{n}\alpha_{ij}LnLE_{t-j} + \sum_{j=1}^{n}\alpha_{ij}LnRGDP_{t-j} + \sum_{j=1}^{n}\alpha_{ij}\Delta LnNX + \sum_{j=1}^{n}\alpha_{ij}LNREER_{t-j}$$
$$+\sum_{j=1}^{n}\alpha_{ij}LnFDI_{t-j} + \sum_{j=1}^{n}\alpha_{ij}LnTGEE_{t-j} + \sum_{j=1}^{n}\alpha_{ij}LnTOP_{t-j} + \sum_{j=1}^{n}\alpha_{ij}LnPSE_{t-j} + \xi_{8t} \quad (12)$$

where ξ_{t-1} represents the error correction term lagged by one period, also other variables were obtained the optimal lag length that was required in the study.

4. Results and Discussion

Table 1: Descriptive Statistics Result

Variables	Description	Mean	S.D.	Max	Min	Obs
RGDP	Nominal GDP divided GDP deflator	20.55	6.18	42.75	10.87	35
NX	Total export minus total import	442.10	619.83	354.46	10.50	35
REER	The price of country in term of another	0.00	1.06	2.45	-2.37	35
FDI	Measure in USD & as a share of GDP	0.00	1.31	4.52	-2.01	35
TGEE	TGEE, total (% of GDP)	21.94	21.91	104.31	3.40	35
TOP	Export plus import divided by GDP	18.30	9.82	45.33	0.41	35
PSE	Age who attends primary/secondary	7.67	6.27	27.29	-0.86	35
LE	Sum of ages members when they died	76.64	67.88	448.00	3.42	35

Source: Author (s) Computation, 2022

The average value of 442.10 is reported in the case of net export. The value is far below what is on record in previous years going by the downward trend in net export. This suggests that there is a reduction in the level of exportation, which equally importation of goods is going upward. During the period under review, there was a mean value of 0.00

for foreign direct investment. This shows that the environment in Nigeria is not favourable for international investors to succeed. It should be noted that the zero mean implies negativity of the absolute values and negative values of real exchange rate; it implies they are weak and ineffective. More so, total government expenditure on education stands at mean value of 21.94% suggesting a below average contribution to RGDP. The trade openness mean value of 18.30, this also indicates below average contribution to RGDP. Similarly, and primary school education mean value stands at 7.67% and life expectancy stands at mean value of 76.64%, this looks appreciable.

Table 2: Correlation Matrix Result

Vari.	RGDP	NX	REER	FDI	TGEE	TOP	PSE	LE
RGDP	1							
NX	0.234	1						
REER	0.121	-0.917	1					
FDI	0.297	-0.936	0.914	1				
TGEE	0.207	-0.727	0.698	0.692	1			
TOP	0.437	0.372	-0.419	0.527	-0.035	1		
PSE	0.043	-0.804	0.841	0.811	0.710	-0.413	1	
LE	0.123	-0.923	0.895	0.944	0.793	-0.450	0.920	1

Source: Author (s) Computation, 2022

The correlation matrix is commonly used to determine the degree of similarity or association between two variables, which can be direct (positive) or indirect (negative) (negative). The connection can also be divided into three categories: weak, moderate, and strong. While both weak and moderate relationships have been empirically proven, significant correlations usually imply that the same variables are affected by multicollinearity. The correlation matrix results, which are shown in Table 2, reveal that the dataset is free of any sort of multicollinearity. Similarly, the negative indications in the metrics of net export and trade openness remained an inverse relation of nexus direction. Primary school enrollment and foreign direct investment have a positive relationship, but economic growth has a negative relationship.

Table 3: ADF Unit Root Test Result

Variables	t-Stat	Prob.	Order of Integration	Max Lag	Obs
D(RGDP)	-5.2175	0.0017	I(1)	1	35
D(NX)	-6.4182	0.0001	I(1)	1	35
D(REER)	-7.4176	0.0000	I(1)	1	35
D(FDI)	-7.1968	0.0000	I(1)	1	35
D(TGEE)	-5.5072	0.0007	I(1)	1	35
D(TOP)	-6.3745	0.0001	I(1)	1	35
D(PSE)	-4.7534	0.0041	I(1)	1	35
D(LE)	-5.9007	0.0004	I(1)	1	35
Test Critical Values:		1%	-4.356068		
		5%	-3.595026		
		10%	-3.233456		

Prob.** Were Computed With Assumption Of Asympotic Normality
The Schwarz Information Criterion (SIC) was used to determine optimum lags length for the ADF.
Source: Author (s) Computation, 2022

The ADF test statistic was utilized in this study to identify the order of integration, and the findings are presented in Table 3 below. It was discovered that when ADF statistics were combined with the variables p values levels with initial difference, the results revealed that all included variables were statistically significant at all levels of crucial values, namely 1%, 5%, and 10%. There is an existence of unit root as it can be seen in the table above. This suggests that all the variables are nonstationary at levels I(0). On this note, the null hypothesis is therefore accepted at levels and this equally suggests non-stationary variables after first difference I(1) is fail accepted for all the variables.

Table 4: Johansen Cointegration Test Result

Unrestricted Cointegration Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.983054	298.9516	159.5297	0.0000
At most 1 *	0.875717	164.3863	125.6154	0.0000
At most 2	0.653390	95.57502	95.75366	0.0514
At most 3	0.483466	60.60973	69.81889	0.2171
At most 4	0.434676	38.80947	47.85613	0.2679
At most 5	0.319337	19.98770	29.79707	0.4237
At most 6	0.117833	7.292996	15.49471	0.5438
At most 7	0.091197	3.155673	3.841466	0.0757

Unrestricted Cointegration Test (Max. Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.983054	134.5653	52.36261	0.0000
At most 1 *	0.875717	68.81132	46.23142	0.0001
At most 2	0.653390	34.96529	40.07757	0.1684
At most 3	0.483466	21.80026	33.87687	0.6231
At most 4	0.434676	18.82177	27.58434	0.4284
At most 5	0.319337	12.69470	21.13162	0.4807
At most 6	0.117833	4.137324	14.26460	0.8446
At most 7	0.091197	3.155673	3.841466	0.0757

Source: Author (s) Computation, 2022

The test revealed as shown in the Table 4, the ranking of cointegration between Maximum Eigenvalue and trace indicate that, there are two (2) cointegration among the used variables this study at 5% level of significance. And therefore, we fail to accept the null hypothesis

that there is no cointegration. This indicates there is an existence of long-run nexus between the variables during the periods under review. On this note, we furthered conducted error correction model estimate, so as to enable us to correct any deviation from the variables used in the study.

Table 5: Parsimonious Error Correlation Result

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	31.91574	13.75616	2.320106	0.0288
TGEE	-0.006216	0.159978	-0.038858	0.9693
TOP	0.047961	0.056119	0.854626	0.0001
REER	-2.745170	3.156136	0.869788	0.3927
PSE	0.530029	2.035429	0.260401	0.041
NX	-0.203536	3.069649	-0.066306	0.9477
LE	-0.707708	0.421559	-1.678789	0.0057
FDI	0.076345	0.067697	-1.127752	0.0301
ECM(-1)	-0.834860	0.275855	0.304000	0.7636
R-squared	0.751368			
Adjusted R-squared	0.703206			
S.E. of regression	2.490401			
Sum squared resid	155.0524			
Dunbin-Watson	1.975293			
F-statistic	3.404024			
Prob(F-statistic)	0.000001			

Source: Author (s) Computation, 2022

From the Table 5, estimate of the RGDP model occurs during a time when there are huge fluctuations in the explanatory variables, movement in the RGDP is estimated using an error correction model given cointegration. The short-run dynamics or adjustment of the cointegrated variables towards their equilibrium values must therefore be described by an error correction model (ECM). The result suggests that total government expenditure on education coefficient is a consequential factor in explaining economic growth. Specifically, as shown in the above findings that, the parameter estimate of total government expenditure on education assumes a negative and statistically insignificant value at 5% level of significance. This suggests that a unit increase of total government expenditure on education will lead to 0.006216 decrease in economic growth. Accordingly, the coefficient of

the parameter estimates of the effect of trade openness on economic growth which is also one of the important macroeconomic variables for this study assumes a positive and statistically significant at 5% level of significance. This is interpreted to mean that a 1 percent point increase in trade openness will lead to 0.047961 increases in economic growth in Nigeria.

The insignificant and negative relationship between real exchange rate and economic growth is an also variable of interest. It reveals that a unit increase in real exchange rate will bring about 2.745170 decreases in economic growth. This is consistent with our theoretical apriori expectation. The net export variable for this study is insignificant and negative nexus with economic growth at 5% level of significance. This implies that one percent increase in net export will bring about 0.203536 decreases in economic growth. However, Ergin and Ban (2017) has the similar result with this finding. More so, life expectancy from above outcome is statistically significant but negative at 5% level of significance, this is in line with our apriori expectation stated earlier. Thus, this indicates that a unit increase in life expectancy will bring about 0.707708 decreases in economic growth. Also, from the findings, parameter foreign direct investment is positive and statistically significant 5% significance level. This shows that a unit increase in foreign direct investment will bring about 0.076345 increases in the growth of the economy. However, studies like Balavac and Pugh (2016) and Khobai and Chitauro (2018) found out in their studies that trade openness is positive and statistically significant affecting economic growth; Obi and Obi (2014) also discovered positive relationship that exist between primary school education and the growth of the economy. While Ojeyinka and Adegboye (2017) found that trade openness is inversely related to economic growth.

Table 6: Granger Causality Test Result

Null Hypothesis:	Obs	F-Statistic	Prob.
LE does not Granger Cause RGDP	33	1.72427	0.2026
RGDP does not Granger Cause LE		9.53944	0.0011
NX does not Granger Cause RGDP	33	1.94653	0.0077
RGDP does not Granger Cause NX		1.29361	0.2953
PSE does not Granger Cause RGDP	33	0.82142	0.4534
RGDP does not Granger Cause PSE		0.83408	0.4482
REER does not Granger Cause RGDP	33	1.16099	0.3325
RGDP does not Granger Cause REER		0.54043	0.5904
TGEE does not Granger Cause RGDP	33	2.23860	0.1314
RGDP does not Granger Cause TGEE		1.88798	0.1762

TOP does not Granger Cause RGDP	33	2.61226	0.0070
RGDP does not Granger Cause TOP		3.11811	0.0652
FDI does not Granger Cause RGDP	33	2.00695	0.0024
RGDP does not Granger Cause FDI		0.89129	0.0361

Source: Author (s) Computation, 2022

Table 6 of granger causality estimate indicates that life expectancy (LE) does not granger caused real gross domestic product, while RGDP does granger caused life expectancy. We therefore accept the hypothesis that life expectancy does not granger caused RGDP and we fail to accept the hypothesis that RGDP does granger caused LE. This suggests that there is unidirectional relationships exist between gross domestic product growth rate and life expectancy. Also, the result above also, reveals the net export (NX) does granger caused gross domestic product growth rate, whereas gross domestic product growth rate does not granger caused net export. Owing to this fact, we fail to accept the hypothesis that NX does granger caused RGDP, and accept the hypothesis that RGDP does not granger caused NX. This indicates that, there is a unidirectional found for RGDP and NX.

The result equally, shows that the trade openness (TOP) does granger caused RGDP, while RGDP does not granger caused TOP. On this note, we fail to accept the hypothesis that TOP does granger caused RGDP, and accept the hypothesis that RGDP does not granger caused TOP. This implies that, there is a unidirectional found for TOP and RGDP. From the result above, it equally shows that foreign direct investment (FDI) does granger caused real gross domestic product while RGDP does granger caused FDI. This simply means we do fail to accept the hypotheses that both RGDP and FDI do granger caused each other. This shows that, there is mutual relationship between RGDP and FDI. The study further suggests that there is unidirectional causality which occurring from life expectancy, net export and trade openness to gross domestic product growth rate. Other variables such as primary school enrolment (PSE), real exchange rate (REER) and total government expenditure on education (TGEE) does not granger caused RGDP in Nigeria.

Table 7: Autocorrelation Test Result

Lags	**LM-Stat**	**Prob**
1	97.89325	0.2041
2	66.16502	0.4020

Source: Author (s) Computation, 2022

Table 7 correlation result indicates that the p-values (0.4020) and (0.2041) are not significant. This suggests that we accept the null hypothesis, according to which there is no correlation between the study's variables. The lack of correlation demonstrates that the study's data are accurate and suitable for estimation. Data must be free of correlation because if correlation occurs in the data used for the analysis, the conclusion can be false. We rarely have the ability to make sense of an erroneous result.

Table 8: Normality Test Result

Comp.	**Skewness**	**Chi-sq**	**Df**	**Prob.**
1	1.634824	14.69957	1	0.0001
2	-1.084903	6.473577	1	0.0109
3	-0.026077	0.003740	1	0.9512
4	-0.553650	1.685905	1	0.1941
5	0.194783	0.208672	1	0.6478
6	0.050424	0.013984	1	0.9059
7	0.573586	1.809506	1	0.1786
8	-0.189314	0.197119	1	0.6571
Joint		**25.09208**	**8**	**0.0015**
Comp.	**Kurtosis**	**Chi-sq**	**Df**	**Prob.**
1	7.517623	28.06226	1	0.0000
2	5.569264	9.076539	1	0.0026
3	5.502986	8.614292	1	0.0033
4	4.602358	3.530381	1	0.0603
5	4.438759	2.846290	1	0.0916
6	2.265750	0.741293	1	0.3892
7	3.042980	0.002540	1	0.9598
8	3.322727	0.143210	1	0.7051
Joint		**53.01681**	**8**	**0.0000**
Comp.	**Jarque-Bera**	**Df**	**Prob.**	
1	42.76184	2	0.0000	
2	15.55012	2	0.0004	
3	8.618031	2	0.0134	
4	5.216286	2	0.0737	
5	3.054962	2	0.2171	
6	0.755277	2	0.6855	
7	1.812046	2	0.4041	

8	0.340329	2	0.8435
Joint	**78.10889**	**16**	**0.5687**

Source: Author (s) Computation, 2022

Three statistical tests were run using the table 8 outcome result above. We have Jarque-Bera, kurtosis, and skewness. However, because Jarque-Bera always accounts for both skewness and kurtosis in its competition, it is the Jarque-Bera test that most people are interested in. Each of the eight components; RGDP, NX, REER, FDI, TGEE, TOP, PSE, and LE represents a different variable in the system. Three of the components (RGDP, NX and REER) are not normally distributed while the rest components (FDI, TGEE, TOP, PSE and LE) are normally distributed, but the overall value shows insignificant (0.5687) of the components is normally distributed. This indicates that, we accept the null hypothesis that the model of this study is normal and the model is proven to be suitable for estimate. This also suggests that the variables utilised for this study are normally distributed.

5. Conclusion and Recommendations

This study examines the effect of human capital and trade openness on economic growth in Nigeria spanning between 1986 to 2020 to determine the effect, human capital and trade openness has on economic growth and also their relationship. To begin with, the stationarity of the variables was tested using the unit root test and ADF, and it was discovered that all the variables were stationary at the first difference. The Johansen cointegration test was used to examine the variables' long-term nexus, and the results show that there is a long-term link between the variables. Error correction model was adopted as an estimating technique for the study. The results show that life expectancy is negatively and statistically significant related to economic growth in Nigeria while trade openness, primary school education, and foreign direct investment are positively and statistically significant on economic growth. The findings also show that total government expenditure on education, real exchange rate, and net export are inversely and insignificantly related to economic growth. It is advised that the government should make an effort to give the educational sector priority by boosting its funding. In order for Nigeria to experience a trade surplus, the government should also control the exchange rate and pay greater attention to net export.

References

Ajadi, O. T., & Adebakin, A. B. (2014). Human capital development as correlate of economic growth in Nigeria. In *The African Symposium*, *134*(14), 1-2.

Akalpler, E., & Shamadeen, B. (2017). The Role of Net Export on Economic Growth in United States of America. *Journal of Applied Economic Sciences*, *12*(3), 772-781

Amna, I. R., Yaseen, M. R., Kousar, R., Usman, M., & Makhdum, M. S. A. (2020). Impact of trade openness and human capital on economic growth: a comparative investigation of Asian countries. *Sustainability*, *12*(7), 29-30.

Balavac, M., & Pugh, G. (2016). The link between trade openness, export diversification, institutions and output volatility in transition countries. *Economic Systems*, *40*(2), 273-287.

Baltagi, B. H., Demetriades, P. O., & Law, S. H. (2009). Financial development and openness: Evidence from panel data. *Journal of development economics*, *89*(2), 285-296.

Barro, R. J. (1991). Economic growth in a cross section of countries. *The quarterly journal of economics*, *106*(2), 407-443.

Grossman, G. M., & Helpman, E. (1991). Trade, knowledge spillovers, and growth. *European economic review*, *35*(2-3), 517-526.

Haouas, I., & Yagoubi, M. (2005). *Openness and human capital as sources of productivity growth: An empirical investigation from the MENA Countries* (No. 1461). IZA Discussion Papers.

Keho, Y. (2017a). The impact of trade openness on economic growth: The case of Cote d'Ivoire. *Cogent Economics & Finance*, *5*(1), 1-20.

Keho, Y. (2017b). Financial development and poverty reduction: evidence from selected African countries. *International journal of financial research*, *8*(4), 90-98.

Kerebana, T. K., & Krama, I. J. (2021). Trade Openness, Human Capital Investment and Economic Growth in Nigeria. *International Journal of Development and Economic Sustainability*, *9*(3), 57-71.

King, R. G., & Levine, R. (1993). Financial intermediation and economic development. *Capital markets and financial intermediation*, 156-189.

Khobai, H., & Chitauro, M. (2018). The impact of trade liberalisation on economic growth in Switzerland.

Levine, R., & Renelt, D. (1992). A sensitivity analysis of cross-country growth regressions. *The American Economic Review*, *82*(4), 942-963.

Nelson, R. R., & Phelps, E. S. (1966). Investment in humans, technological diffusion, and economic growth. *The American economic review*, *56*(1/2), 69-75.

Nduka, E. K. (2013). Openness and economic growth in Nigeria. *Journal of Education and practice*, *4*(1), 68-73.

Nduka, E. K., Chukwu, J. O., Ugbor, K. I., & Nwakaire, O. N. (2013). Trade openness and economic growth: A comparative analysis of the pre and post structural adjustment programme (SAP) periods in Nigeria. *Asian Journal of Business and Economics*, *3*(3.4), 1-12.

Obi, Z. C., & Obi, C. O. (2014). Impact of government expenditure on education: The Nigerian experience. *International Journal of Business and Finance Management Research*, *2*(2014), 42-48.

Ojeyinka, T. A., & Adegboye, A. A. (2017). Trade liberalization and economic performance in Nigeria: Evidence from agricultural and manufacturing sectors. *African Journal of Economic Review*, *5*(3), 1-14.

Pan, X., Uddin, M. K., Han, C., & Pan, X. (2019). Dynamics of financial development, trade openness, technological innovation and energy intensity: Evidence from Bangladesh. *Energy*, *171*, 456-464.