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HUMAN CAPITAL DEVELOPMENT, CAPABILITIES AND ECONOMIC GROWTH IN NIGERIA

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Abstract

Human capital development has been identified by various authors as part of the economic growth determinant. It is impossible to achieve sustainable growth without matching the relationship between human capital and economic growth with appropriate capabilities. This study sought to examine the relationship among human capital development, capabilities, and economic growth in Nigeria using time series data spanning from 1984 to 2021. Autoregressive Distributed Lag (ARDL) cointegration estimation technique was employed to analyse the relationship among human capital development, capabilities, and economic growth as confirmed by pre-test results [Phillip Peron (PP) and Augmented Dickey-Fuller (ADF)] to test for stationarity. The finding reveals that total factor productivity (proxy for innovation capability), Gross capital formation and financial deepening (financial capability) were the capability variables that significantly influenced economic growth. Therefore, the study concludes that human capital development without adequate capabilities, Nigeria will not be able to sustainably grow. Consequently, the government should focus its efforts on devising policies that will revolutionize Nigeria's education system in a manner that will stimulate the economy.

Keywords: Human Capital Development, Total Factor Productivity, Trade Openness, Life Expectancy and Financial Deepening.

Introduction

The development of a nation is not solely determined by the allocation of natural resources or the amount of physical capital stock, but rather by the quality and quantity of its human resources. Human resources are active entities that interact with other resources to create output. Human resources development is important to the growth and productivity of any organization. Any country that is struggling or found it difficult to improve the skills and knowledge base of its citizen and effectively utilize them for the development of the nation, will not be able to achieve anything (Aurora and Natércia, 2003). This confirms the essential role of human resources development in the process of development. It also attests to the fact that human capital plays an important key role in the economic development of any nation (Ogujiuba, 2013).

Human capital is the total stock of a country's labour force that has the capacity such as skills, knowledge and managerial ability needed to transform the land, capital and other required inputs to produce commodities as output that will satisfy human desire. Human capital development yields a

high level of productivity if properly harnessed. All growth theories, from the classical growth theory to the endogenous growth theory, have identified investment as a fundamental component of economic growth; however, the new growth theory emphasizes the accumulation of knowledge (human capital formation) as a successful investment that will effectively enhance economic growth. Barro and Sala-i-Martin (2004) suggested that human capital generates economic development, especially in the long run if it can be combined with mechanisms such as innovation that can generate returns to capital and positively contribute to long-term growth. The importance of capabilities in the adoption and diffusion of technologies was emphasized by Abramovitz (1986). He opined that the contribution of human capital to the growth of the economy depends on the country's capabilities. Capabilities according to Abramovitz (1986) include all factors that allow full utilization of economic agents' potential.

No doubt, that it is adequate human capital development that can significantly influence economic growth in any country. Yilmazer and Cinar (2015) noted that the development of human capital is a key factor in achieving economic growth and development. Nigeria's planning was centered on ensuring physical capital accumulation for swift growth and development in the past, while the role of human capital in the development process was not adequately recognized. Since Nigeria independent, her economic objective has been to achieve stability, output expansion, social progress, and self-sufficiency among others. But, internal problems have been inhibiting this. The problems are lack of adequate human development programme, crude agricultural practices, inadequate infrastructure facilities, an underdeveloped manufacturing sector, poorly planned policy, and mismanagement of limited resources.

According to Yilmazer and Cinar (2015), developing countries witness faster per capita income than developed countries but unfortunately, it is an arduous task for them to reach their development level. They agreed that the major reason for developed countries' high per capita income is the ability of their skilled workforce to produce technological advancements that positively influence their output. Hence, need for improvement in human capital and closing the gap of human capital development among countries to attain economic growth sustainability.

In the literature, endogenous growth postulates that knowledge is important for a country's economic growth and that human capital refers to the knowledge embodied in humans (Ali, Egbetokun and Memon, 2016). Ali et al acknowledge that knowledge acquired through education and productivity capabilities is recognized as important key drivers of economic growth. They asserted that the development of capabilities is essential for the development of human capital and the growth of the economy. Sen, (1999) opined that enhancing people's capabilities can lead to a broader range of

options and better skill development, ultimately contributing more effectively to the economic development process as functional variables.

The argument is that simply enhancing or increasing human capital is inadequate if the capabilities to generate output is not concurrently increased (Ranis, Stewart, and Ramirez 2000). On this basis, all other economic fundamentals that can improve the economic productivity of the economy are very important. Abramowitz (1986) emphasizes the significance of being able to learn and utilize new technology, attracting financial investments, and engaging in international trade in the process of catching up with more advanced economies. The idea of capabilities extends beyond just human knowledge and skills, and encompasses factors related to economic opportunities within the context of the determinants of the catching-up process. Sen (1999) viewed development as the expansion of capabilities, and are essential for the nation's economic development. From the views of both Abramovitz and Sen, It is evident that analyzing economic growth requires more than just considering the inputs of labor (human capital) and capital (physical capital) in the production function. As a result, the optimal contribution of human capital to economic growth is dependent on its combination with the necessary capabilities.

The attempt to connect economic growth with human capital with capabilities will help to resolve the controversy that arose when early researchers looked at the relationship between human capital with economic growth. Ramirez and Stewart (1998) concluded that, human capital and economic growth are inextricably linked, but there is little agreement on the factors that bind them together. Many research works have been conducted by researchers in Nigeria with the majority focused on the relationship between human capital and economic growth without considering the effect of capability variables in the relationship. It is therefore relevant to explore the relationship between human capital development and economic growth by incorporating capability variables.

There are different types of capabilities have been delineated in literature, including human capabilities, financial capabilities, social capabilities and economic capabilities. Yilmazer and Cinar (2003) discovered that the impact of human capital development on economic growth was indirect through innovation. Their work demonstrates the significance of possessing a relatively substantial amount of human capital in order for a nation to fully realize the advantages of its domestic innovation endeavours. While other researchers include different capabilities variables in their studies.

Human capital and economic growth have been widely discussed in the literature, most especially that of endogenous growth theory, ranging from Arrow's learning-by-doing to Romer's Endogenous

Technical Change, which suggests that innovation can enhance human capabilities. The findings of these studies are not yet definitive. Ali et al (2016) indicates that the regression outcomes of both the human capital and economic growth analyses are influenced by other variables, and that other variables associated with human capital should be incorporated into the analysis. This is why the focus of this study is on the impact of capability variables on the link between human capital development and economic development in Nigeria.

Research Methods

Model Specification

For the purpose of this study, the model used is the Endogenous Growth Model, with particular reference to Ali et al (2016), modified to include capability variables, and specified as follows:

$GDP_t = f(TFP_t, GCF_t, HCD_t, LEXP_t, TOP_t, FD_t)$ …….. 3.1

The model is explicitly defined thus:

$$GDP_t = \alpha + \beta_1 TFP_t + \beta_2 GCF_t + \beta_3 HCD_t + \beta_4 LEXP_t + \beta_5 TOP_t + \beta_6 FD_t + \varepsilon_t \quad \ldots 3.2$$

Definition of Variables.

GDP_t = Gross Domestic Product.

TFP_t = Total Factor Productivity capturing innovation capability.

GCF_t = Gross Capital Formation capturing financial capability.

HCD_t = Human Capital Development measured by the addition of primary and secondary enrolment.

$LEXP_t$ = Life Expectancy capturing health capability.

TOP_t = Trade Openness capturing economic capability.

FD_t = Financial Deepening also capturing financial capability.

Apriori Expectation

In Nigeria, it is anticipated that there will be a positive relationship between economic growth and other selected variables.

Symbolically, the expected relationship can be expressed as follows:

$\beta_1 > 0, \beta_2 > 0, \beta_3 > 0, \beta_4 > 0, \beta_5 > 0, \beta_6 > 0$.

Estimation Technique

The method used in this study is the Autoregressive Distributed Lag (ARDL) approach to co-Integration to evaluate the relationship between variables of interest.

Sources of Data

Secondary data was used in this study. Therefore, GDP, Gross Capital formation, School enrolment, life expectancy and financial deepening were obtained from statistical Bulletin of the Central Bank of Nigeria (CBN), National bureau of statistics (NBS) and World Bank data base. Total factor productivity and Trade openness were computed.

Results.

Testing the Normality in the Distribution of the Data Set in the Study.

Table 1: Descriptive Statistics.

	GDP	TFP	HCD	LEXP	GCF	TOP	FD
Mean	33725.22	1.44E-06	127.1663	48.09308	3.33E+10	0.159303	14.20263
Median	23068.85	1.14E-06	130.4250	46.19550	1.93E+10	0.104135	12.69500
Maximum	69810.02	6.72E-06	150.3300	54.63800	7.42E+10	0.468774	21.31000
Minimum	13779.26	-5.06E-06	100.3500	45.63500	9.57E+09	0.000978	9.150000
Std. Dev.	19578.10	2.15E-06	11.56620	2.860100	2.21E+10	0.156067	3.932046
Skewness	0.734406	0.131083	-0.385775	0.951401	0.735770	0.530492	0.598722
Kurtosis	1.996529	4.794092	2.328980	2.405596	1.876739	1.839933	1.829066
Jarque-Bera	5.010239	5.205205	1.655465	6.292120	5.426315	3.913114	4.441184
Probability	0.081666	0.074081	0.437039	0.043021	0.066327	0.141344	0.108545
Sum	1281558.	5.49E-05	4832.320	1827.537	1.26E+12	6.053521	539.7000
Sum Sq. Dev.	1.42E+10	1.71E-10	4949.748	302.6664	1.80E+22	0.901209	572.0563
Observations	38	38	38	38	38	38	38

Source: Authors' Computation (2023).

Table 1 shows that TFP and TOP are symmetrical while GDP, HCD, LEXP, GCF and FD are asymmetrical in their distribution. TFP is normally skewed, while GDP, LEXP, GCF, TOP and FD are positively skewed and HCD is negatively skewed. Result of kurtosis shows that GDP, HCD, LEXP, GCF, TOP and FD are platykurtic, while TFP is leptokurtic. Jarque-Bera statistic revealed that GDP, TFP, HCD, GCF, TOP and FD are normally distributed while LEXP is not.

Testing the Correlation among the Series using Correlation Matrix

It is pertinent to be sure whether there is interaction among the variables before proceeding to other estimations. This study used a correlation matrix to examine that.

Table 2: Correlation Matrix of Selected Series

	GDP	TFP	HCD	LEXP	GCF	TOP	FD
GDP	1.000000	0.873514	0.084224	-0.058165	-0.054758	0.261874	0.147215
TFP	0.873514	1.000000	-0.166377	-0.400015	-0.321351	-0.052791	-0.101613
HCD	0.084224	-0.166377	1.000000	0.647284	0.561066	0.610132	0.611409
LEXP	-0.058165	-0.400015	0.647284	1.000000	0.850956	0.663952	0.603102
GCF	-0.054758	-0.321351	0.561066	0.850956	1.000000	0.775156	0.810418
TOP	0.261874	-0.052791	0.610132	0.663952	0.775156	1.000000	0.854627
FD	0.147215	-0.101613	0.611409	0.603102	0.810418	0.854627	1.000000

Source: Authors' Computation (2023).

Table 2 shows that LEXP and GCF are negatively correlated with GDP while TFP, HCD, TOP and FD are positively correlated with GDP.

Time Series Properties of the Variable**.**

Table 3. Unit Root Test**.**

Variables	Level			First Difference			Order of Integration
	P.P Statistics	ADF Statistics	5% critical Value	P.P Statistics	ADF Statistics	5% critical Value	
GDP	-3.1610	-3.2595	-2.9434	----------	----------	---------	I(0)
TFP	-3.9666	-4.0885	-2.9434	----------	----------	---------	I(0)
HCD	-1.6624	-1.9434	-2.9434	-5.3914	-5.3946	-2.9458	I(1)
GCF	-0.8595	-0.4614	-2.9434	-4.4284	-4.1431	-2.9458	I(1)
FD	-1.1093	-1.07071	-2.9434	-5.8189	-5.6378	-2.9458	I(1)
LEXP	-1.8767	-2.1157	-2.9434	-4.1150	-4.1150	-2.9458	I(1)
TOP	0.1584	0.1407	-2.9434	-4.6391	-4.7110	-2.9458	I(1)

Source: Authors' Computation (2023)

The unit root test results of both Augmented Dickey-Fuller (ADF) and Phillip Peron (PP) confirmed that GDP and TFP are stationary at their levels while HCD, GCF, FD, LEXP and TOP are made stationary at their first difference. The fact that all the variables are not similar in their order of integration means that Johansen cointegration criteria cannot be met. Therefore, this study employed Autoregressive Distributed Lag (ARDL) cointegration procedure.

Testing the Long-run relationship Among the Series

Table 4: Co-integration Bound Test for GDP

F- Statistic 10.1703		
Level of Significance	I(0) Bound	I(1) Bound
10%	1.99	2.94
5%	2.27	3.28
2.5%	2.55	3.61
1%	2.88	3.9 9

Source: Authors' Computation, (2023)

Table 4 revealed that the result established that long-run relationship. Given that the estimated F-statistic value of 10.1703 exceeds the upper bound's critical values even at a 1% significant level. It

affirms the existence of long-run relationship among the variables. Therefore, both short run and long run dynamism shall be estimated through ARDL.

Table 5: Long Run Analysis Result
Dependent Variable: GDP

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.666409	6.552829	-0.101698	0.9197
GDP(-1)	0.637088	0.338919	1.879766	0.0702
TFP(-1)	0.077743	0.034266	2.268808	0.0264
HCD(-1)	0.039365	0.059774	0.658560	0.5154
LEXP(-1)	0.053334	0.046357	1.150512	0.2593
GCF(-1)	2.91E-10	6.47E-11	4.497983	0.0001
TOP(-1)	4.688879	7.171298	0.653840	0.5184
FD(-1)	1.065720	0.294295	3.621267	0.0011

R-squared	0.682477	Mean dependent var	4.286193
Adjusted R-squared	0.605834	S.D. dependent var	4.395696
S.E. of regression	2.759735	Akaike info criterion	5.056957
Sum squared resid	220.8680	Schwarz criterion	5.405264
Log likelihood	-85.55371	Hannan-Quinn criter.	5.179751
F-statistic	8.904572	Durbin-Watson stat	2.225776
Prob(F-statistic)	0.000008		

Source: Authors' Computation, (2023)

The result in Table 5 showed that gross capital formation, total factor productivity and financial deepening have significant effect on Nigeria's economic growth in the long run. This indicates that gross capital formation and financial deepening have a positive influence on Nigeria's economic growth. Human capital development, life expectancy and trade openness have insignificantly impacted on Nigeria's economic growth in the long run. R^2 value of 0.68 affirms that approximately 68% of the variation in the dependent variable was explained by the selected capabilities. Since gross capital formation and financial deepening are measures of financial capacity, and total factor productivity captured innovation capacity. Therefore, financial and innovation capabilities significantly influence Nigeria's economic growth in the long run.

The Short-run Dynamic Relationship among the Series
Table 6: Error Correction Model (ECM) result
Dependent Variable: D(GDP)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.062331	0.438963	-0.141996	0.8881
D(GDP(-1))	0.845688	0.349507	2.419662	0.0225
D(TFP(-1))	0.177438	0.134266	1.323813	0.2309
D(HCD(-1))	0.105887	0.063581	1.665387	0.1074
D(LEXP(-1))	0.009142	0.048796	0.187343	0.8528
D(GCF(-1))	2.48E-10	7.58E-11	3.272939	0.0029
D(TOP(-1))	3.095446	11.57124	0.267512	0.7911
D(FD(-1))	1.028285	0.299343	3.435141	0.0019
ECM(-1)	-1.340055	0.225128	-5.952412	0.0000
R-squared	0.740209	Mean dependent var		0.103183
Adjusted R-squared	0.663234	S.D. dependent var		4.257323
S.E. of regression	2.470591	Akaike info criterion		4.859109
Sum squared resid	164.8031	Schwarz criterion		5.254989
Log likelihood	-78.46397	Hannan-Quinn criter.		4.997282
F-statistic	9.616213	Durbin-Watson stat		2.019960
Prob(F-statistic)	0.000003			

Source: Authors' Computation, (2023)

The results of table 6 revealed that only gross capital formation and financial deepening have significant impact on Nigeria's economic growth in the short run. Total factor productivity, human capital development, life expectancy, and trade openness does not significantly impact Nigeria's economic growth in the short run. The ECM coefficient is significant and negative as shown in table 6. The significance of the ECM affirmed that long-run equilibrium exit relationship between capabilities and Nigeria's economic growth. The value of R^2 (0.74) confirms that the selected capabilities explained about 74% differential of the dependent variable. Since, gross capital formation and financial deepening captured financial capability. Hence, only financial capability significantly influences economic growth in Nigeria at short run.

Testing for Structural Stability

This study employed cumulative sum of the recursive residuals (CUSUM) and the cumulative sum of squares were used to test for the stability of the model. The plots are shown in figures 1 and 2 below:

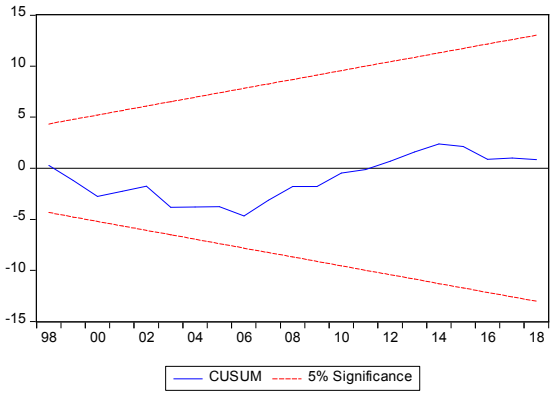

Fig. 1: CUSUM Test for Structural Stability of the Parameters

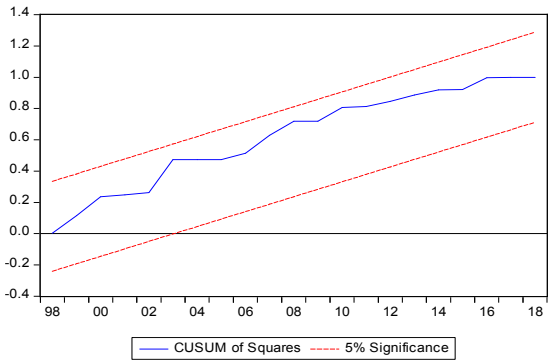

Fig. 2: CUSUM of Squares Test for Structural Stability of the Parameters

The results in fig 1 and fig.2 are suggestive of coefficient stability since the plots did are within the 5% critical bound. The existence of coefficient stability for the estimated parameters were confirmed for both the short run dynamics and the long run of function economic growth over the periods under review. Also, the results affirm tendency of further coefficients stability.

Discussion

The study shows that total factor productivity has significant positive impact on economic growth in Nigeria but only at long run. The implication of positive impact is that an increase in total factor productivity will result to an increase in Nigerian economic growth. This is in accordant with the existing theory. Theoretically, technology has the potential to speed up manufacturing processes, improve labour efficiency (productivity), and enhance production quality and quantity. The outcome is in line with the view taken by Banerjee and Roy (2014), Widarni and Bawona (2021), that technology is the most significant and influential factor contributing to economic growth. But Widarni and Bawono (2021) affirmed that technology is effective driver of economic growth not only in the long run and also, in the short.

Human capital development has positive but insignificant impact on Nigerian economic growth. It is essential to invest in human capital in order to enhance labour productivity in the long run. The lack of impact may be due to a lack of investment in the necessary skills. This is in line with Alfada (2019), which confirmed the positive correlation between human capital and economic development. This finding is contrary to that of Widarni and Bawono (2021) that discovered that human capital is negatively insignificant only in the short run

Life expectancy has an insignificant positive impact (both at short run and long run) on Nigeria economic growth. Based on the predictions of endogenous growth theory, high life expectancy supposed to translate into increase in education investment in long-term and accumulation of more personal knowledge. (Barro and Sala-i-Martin, 1992; Acemoglu and Johnson, 2007). The result is in agreement with Savedoff and Schultz (2000), Schultz (2002), showing that health is positively influencing economic growth by increasing productivity of labour. While Ngangue and Manfred (2015) found that life expectancy has a significant positive impact on economic growth. But, Barro and Lee (2010) shows an inverse relationship between life expectancy and economic growth.

Gross capital formation has direct significant effect on Nigerian economic growth. This implied that an increase in the gross capital formation acts as an economic stimulus, invariably cause an increase in economic growth. This result is tandem with the works of Orji and Peter (2010) and Bakare (2011) found that capital formation has direct significant influence on Nigeria economic growth. This study negate the findings of Anyanwu (2014) and Ajose and Oyedokun (2018) who discovered inverse non-significant relationship between economic growth and capital formation in Nigeria

Trade openness has positive but does not have significant impact on economic growth which contradicted the trade-led growth hypothesis. Finding of this study is in accords with Vlastou (2010), Polat, Shahbaz, Rehman and Satti (2015), Were (2015), Ulaşan (2015), and Lawal, Nwanji, Asaleye and Ahmed. (2016) who found that trade openness has a negligible impact on economic growth. Contrary to Asfaw (2014), Zarra-Nezhad, Hosseinpour and Arman,(2014),Brueckner and Lederman (2015) and Yaya (2017), all of these studies showed that openness contributes to economic growth.

Financial deepening is directly and significantly related to economic growth in Nigeria. Financial deepening is the capacity of financial institutions to efficiently allocate funds for investment within the economy. An efficient financial system typically facilitates and sustains economic development. The finding is in agreement with Nzotta and Okereke (2009), Sulaiman, Oke and Azzez (2012) Mesagam, Ohukwa and Yusuf (2018) who affirmed that there is significant relationship between financial deepening and Nigerian economic growth.

Finally, the study also found that a strong long-term equilibrium relationship exists between economic growth and capability variables employed in the study. This clearly shows that whenever there is an imbalance from the short-term equilibrium level, there will be convergence to the long-term equilibrium. However, the study finds that total factor productivity (proxy for innovation capability), Gross capital formation and financial deepening (financial capability) are the variables that significantly influenced economic growth during the under review**.**

Conclusion

This research explored the influence of capability variables on the relationship between human capital and Nigerian economic growth. The findings of the study indicated that Nigeria's economic growth during the study period was largely driven by innovation and financial capabilities.. Therefore, the study concludes that human capital development without adequate capabilities cannot achieve sustainable growth in Nigeria. Hence, the government should make every effort to formulating appropriate policy to transform Nigeria education system in such a way that will be effective in stimulating economy.

The government should make every effort to formulate appropriate policies to transform the education system in Nigeria.

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