Tertiary Institutions and Human Capital Development in Nigeria: Do Private Institutions Matter?

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Abstract

Given the growing challenge for governments to offer federal colleges and universities the necessary funding due to their alarming population, the rising costs of higher education and the escalating number of potential applicants in Nigeria, this paper investigates the link between tertiary institutions, private institutions and human capital development in Nigeria. This study is anchored on the labour-augmented theoretical framework of Mankiw, Romer, and Weil (1992) and Weil (2000) using the ARDL approach between 1990 and 2020. The findings reveal that tertiary institutions, particularly private institutions, matter in the discourse of Nigeria's human capital development. Specifically, the result shows that the short- and long-run estimation of the number of universities, the number of private universities, and private universities as a percentage of universities increase human capital development, contributing significantly to Nigeria's stability, depth and access to education. However, school enrolment, population growth and labour force had adverse influences on the human capital development in different periods. Hence, the education system, as evidenced by school enrollment, has not been developed to build individual capacity towards semi-formal and informal skills and abilities. The study recommends that tertiary institutions' curricula be developed with an inclusive capacity for skills and abilities. Hence, the study concluded that private institutions matter in human capital development discourse.

Keywords
Human Capital Development, Private Institutions, Tertiary Institutions, ARDL, Nigeria

Introduction

Government officials and development architects have realised that education is critical in improving human capital, boosting productivity and offering a way out of poverty. The United Nations Summit in 2000 and 2015 prioritised the role of education in addressing many economic outcomes. Likewise, the UNESCO publication in 2021 "Reimagining our Futures Together: A New Social Contract for Education." The publication indicates a requirement to "see education as a path to a sustainable common future

and to realise its full transformative potential"(UNESCO, 2022). Numerous countries, including Nigeria, have enthusiastically embraced the UN's declarations, agendas, and compacts, strengthened Nigeria's position and given it new opportunities to accomplish global objectives.

Economic progress may be facilitated by education across the globe (see Figures 1.0 and 2.0), while education itself depends on the health of the economy. According to several academics, improving access to education increases human capital, which boosts labour quality and productivity, and it further supports the purposes of economic growth (Becker & Lewis, 1993). Within this context, the demand and supply of higher education in tertiary institutions have skyrocketed in contemporary Nigeria. Various degrees of education have varying effects on the economy, and higher education is seen to be crucial for boosting economic competitiveness (Min, 2017; Apostu et al., 2022).

Given the role that education plays in constructing a nation, nations all over the world have been making investments in this crucial field (Barro & Lee, 2010). This is because the level of human capital, which typically consists of health and education (Barro, 2013), can be linked to the development of a nation (Umo, 2007; Dauda, 2010; Kakar et al., 2011). Scholars contend that education affects society in both unit and aggregate (Bashir et al., 2012). However, it has proven difficult for the majority of developing nations to make the most use of education to escape the poverty cycle and boost productivity (Barro & Sala-i-Martin, 1997; Anyanwu et al., 1997). Furthermore, education investments facilitate trained labour that may be tailored to development requirements, hence promoting economic growth and elevating societal standards (Yogish, 2006).

One of the sectors with the quickest rate of growth is education, which is a universal service that all nations, regardless of their economic standing, aim to offer to their people. Every day, more and more young people express a desire to attend university to gain knowledge and skills. Evidence shows that a rise in tertiary school enrolment accentuates a rise in the economic development of many nations (Figures 1.0 and 2.0). Every country, developed or developing, aspires to achieve the greatest standards of university education. It is becoming difficult, if not impossible, for governments to offer necessary funding to improve stability, efficiency, depth and access to colleges and universities due to the rising costs of higher education and the increase in the number of potential undergraduates (Benjamin et al., 2011). As a result, private universities have been founded all over the world.

Since Nigeria's independence, there has been a significant increase in both the demand for and supply of higher education, most likely as a result of the benefits of higher education in fostering the development of skills necessary for the country's growth. Following Nigeria's independence in 1960, the country's government seized on the duty of offering

its citizens access to higher education. Of the 170 universities in Nigeria today, 43 are controlled by the Federal Government (see Table 1.0) and are classified as conventional or specialized institutions (National Universities Commission [NUC], 2019). After Nigeria's independence, education provision was shared in the concurrent legislative list, marking the beginning of Nigeria's march toward deregulation of higher education. Nigerian universities are now state-owned and privately owned due to this deregulation with consistent annual increases (Table 1.0).

Given the steadily rising demand for formal education in Nigeria, government investment in capital and ongoing education expenditures has been minimal, inconsistent, and insufficient; as a result, the country's learning infrastructure is unable to meet the need. Additionally, the increased demand for higher education has been primarily linked to the desire for greater access to private universities in Nigeria. Even with the creation of forty-three federal, forty-eight state, and seventy-nine private institutions as of 2019, Okotoni and Adebakin (2015) further clarified that less than thirty per cent of eligible applicants were able to secure admission to universities, yet the exponential growth in expansion and privatization of higher education keeps alarming (see Figure 3.0). Due in large part to the chronic, severe lack of spots available for prospective students in Nigeria's public universities as well as the desire to raise the standard and make higher education more accessible, private universities have sprouted up all over the country to meet the country's growing demand for human capital development (Ajayi and Ekundayo, 2008). In contrast to private institutions, prerequisites for public universities—federal or state—that are non-profit and founded by the government are created at the government's discretion.

In light of the aforementioned, it is necessary to investigate novel policy alternatives for increasing access to higher education via private universities. However, further research is necessary to determine if the current private institutions have made a substantial impact on increasing access or raising the standard of higher education and human capital development.

The study has five structures. Following the introduction, the remainder of the sections are as follows: Section two provides a detailed extensive review. Section three introduces the materials and methodology, while Section four showcases the results and discussion of the findings. Finally, section five offers the paper's conclusion.

Table 1.0: Universities and Ownership in Nigeria

	1948-1970	1971-1980	1981-1990	1991-2000	2001-2010	2011-2020	Total as at 2019
Private Universities	0	0	0	3	37	39	79
State Universities	0	1	7	9	19	12	48
Federal Universities	6	8	8	3	2	16	43
Total	6	9	15	15	58	67	170

Source: National Universities Commission (2019)

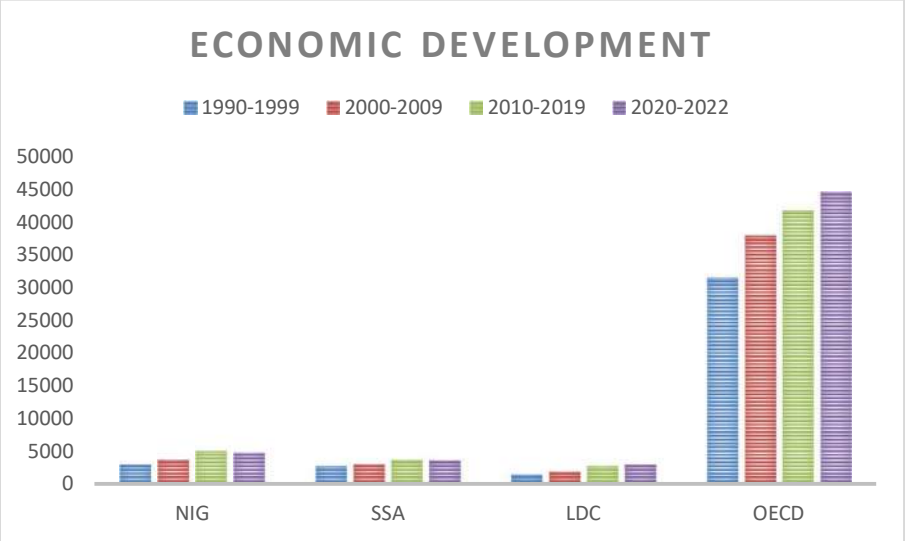


Figure 1.0: Economic Development Across the Globe
Source: World Bank (2023)

Where NIG, SSA, LDC and OECD represent Nigeria, Sub-Saharan Africa, Less Developed Countries and Organization for Economic Co-Operation and Development, respectively.

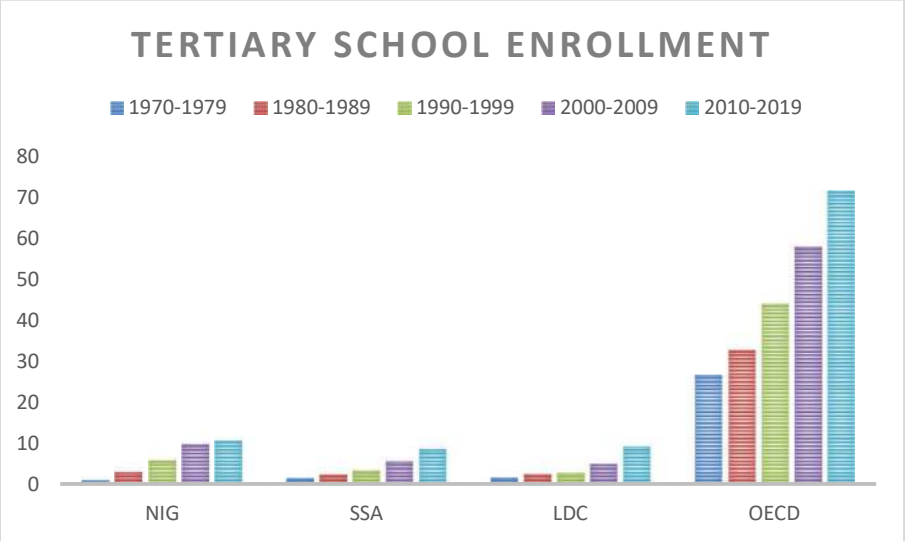


Figure 2.0: Tertiary School Enrolment Across the Globe
Source: World Bank (2023)

Where NIG, SSA, LDC and OECD represent Nigeria, Sub-Saharan Africa, Less Developed Countries and Organization for Economic Co-Operation and Development, respectively.

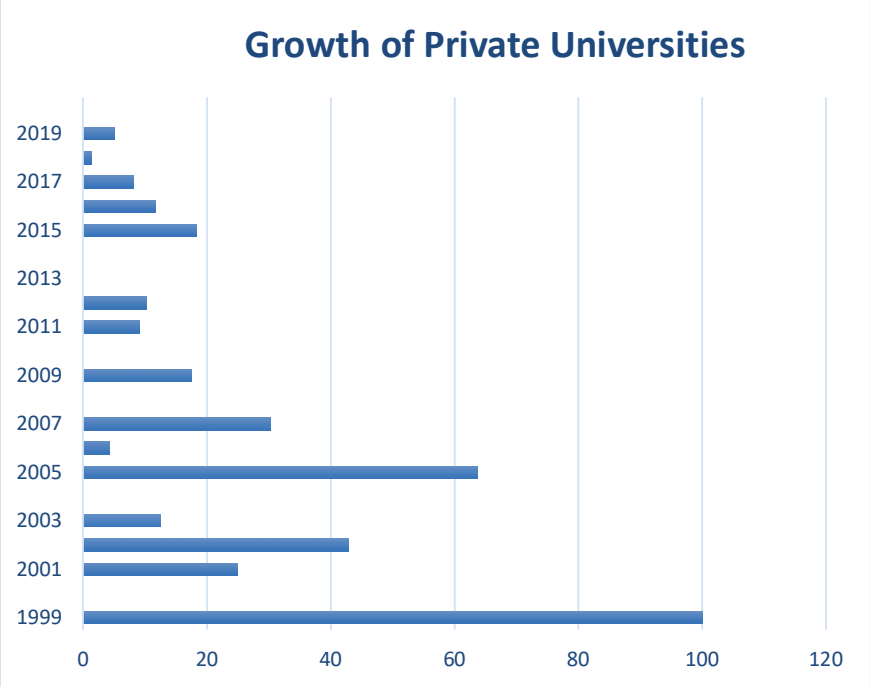


Figure 3.0: Growth of Private Universities in Nigeria
Source: Authors' Calculation Adapted from NUC (2019)

Literature Review

The regional government expanded its education spending in 1955 in acknowledgement of the enormous need for investment in human capital, which was primarily spurred by the implementation of the UPE Programme. For example, from 1954 to 1966, the Western Region's recurrent budget was mostly allocated to education, never falling under 28.9%. On the distribution of funds for education, during 1958 and 1959, recurrent budgets made up around 43% (Babatunde, 2012). As a result, elementary school tuition in the eras of the Western region was abolished. Successive civilian administrations in the area have kept funding education ever since.

A nation's ability to advance economically and socially is greatly influenced by its educational system, which transfers information and skills to the populace and makes them useful to the nation (Ozturk, 2008; Ohwofasa & Obeh, 2023; Khan, et al., 2025; Yu & Liu, 2025). According to Idris et al. (2012), historical and cultural affiliations in society are all products of the educational system instilling and promoting the populace's actions. Increased government investment in education results in a more educated populace, which drives faster and more environmentally friendly growth. Numerous research (Adegboye & Akinyele, 2022; Ozatac et al., 2018; Urhie, 2014) have been conducted on government spending on education and economic growth. Some studies report positive long-run effects of education spending on GDP growth in Nigeria when institutional structures are efficient and macroeconomic conditions are stable. Other research points to insignificant or ambiguous short-run relationships, suggesting inefficiencies in how education funds are allocated or utilized. The effectiveness of education spending on schooling outcomes supports the idea that investment in education enhances human capital, a fundamental driver of sustainable growth. A few studies on government spending on education and human capital, however, were discovered throughout this investigation and are examined in the part that follows.

In research on the importance of government spending on the development of human capital in Nigeria, Okafor and Oseghale (2019) discovered that institutional resources made available for spending on healthcare and educational components did not appreciably raise the HDI in that nation. Conversely, Patel and Annapoorna (2019) discovered that government educational spending had a substantial impact on HDI in India between 1990 and 2014 within the UNDP data source.

Empirical research on Nigeria's public expenditure on education and economic growth reveals mixed outcomes, reflecting both structural challenges in budget allocation and the dynamic interplay between education investment and macroeconomic performance. Ayaga, Nomor, and Obute (2024) applied the Autoregressive Distributed Lag (ARDL) model to Nigerian time-series data and found that government expenditure on education did not have a statistically

significant positive impact on economic growth in both the short and long run. The authors highlight that while labour productivity contributed positively in the short run, educational spending as currently structured appears inefficient and may not effectively stimulate growth under existing institutional arrangements.

In contrast, Chima and Yusuf (2023) examined annual data from 1980 to 2019 and concluded that both capital and recurrent expenditures on education positively affected Nigeria's GDP growth over the study period. Their findings suggest that improved budgetary support for education could enhance long-term economic growth, especially when accompanied by macroeconomic stability. Another recent investigation using quarterly data up to 2023 confirmed that government expenditure in education significantly influences economic growth, especially when combined with efficient public spending policies, though the magnitude may vary depending on other macroeconomic conditions such as interest rates (Udude, Amadi & Amadi, 2023).

Similarly, using data sourced from UNDP and the WB between 2007 and 2017, Edeme and Nelson (2019) studied the structure and the spread benefits of government spending on education and HDI. The study discovered that government spending on both health and education significantly raises HDI. Similarly, Maharda and Aulia (2020) concluded that government health spending on healthcare and education is a major factor in the improvement of HDI in the context of Indonesia. Consequently, more attention needs to be given to investigating the function of government towards spending in educational components in the creation of HC because overall the influence of education on HC development yields contradictory results.

A complementary study by Christopher, Akpan, and Ologunla (2025) also explored capital and recurrent public spending on education alongside health. They found that past GDP per capita exhibits strong momentum, and while education spending's direct impact may vary, its interaction with broader public investment underscores its role in shaping economic growth trajectories in Nigeria. Additionally, research into education budget expenditure effectiveness (1999–2021) showed that capital and recurrent educational budgets contribute to economic growth, albeit with varying levels of statistical significance (Aribaba & Ahmodu, 2024). The authors recommended strengthening budgetary allocations to education to achieve more meaningful economic contributions.

Theory has been provided on the relationship between government resources towards HC by a few researchers. The importance of welfare objectives in developing, safeguarding, and forming HC in many developing countries was the topic of Moroz's discussion paper from 2020. Moroz (2020) emphasized the critical role that social protection plays in these processes. The research also shows that financial transfers contribute to strengthening the bases of HC and that spending on healthcare and educational components

particularly insurance shields HC from adverse shocks in East Asia and the Pacific.

It is necessary to provide university education to all those who are eligible for it (Education Sector Analysis [ESA], 2003). Spending by the government will improve student performance, which will raise per capita income. The global economy should adhere to the standards of qualitative education since it increases employment, production, and the creation of personal income for financial security. Research has shown that improving education increases human capital, which boosts worker quality and productivity, and that educational development supports economic growth (Maharda and Aulia, 2020). This supports economic growth either directly or indirectly (Edeme and Nelson, 2019). Higher education is thought to play a significant role in boosting economic competitiveness. Various degrees of education have varying economic contributions (Moroz, 2020).

The issue in Nigeria is that there are considerably more applications for admission each year than there are openings, which means that colleges are continuously overwhelmed with requests for admission that they are unable to fulfil. The increased demand for higher education has been identified as the primary cause of the need for more access to private universities in Nigeria. Hence, this study investigates the link between the number of universities, the number of private universities, private universities as per cent of universities and human capital development in Nigeria.

Material and Methodology

This study is anchored on the labour-augmented theoretical framework of Mankiw, Romer, Weil (1992) and Weil (2000). According to this theory, growth is a product of an accumulation of capital and labour in addition to other exogenous factors. Within the framework of independent human capital and augmented Cobb-Douglas production function, this section discusses how the models of the study were obtained. Following previous studies (Mankiw, Romer, Weil 1992; Weil, 2000; Bernanke and Gurkanak, 2001; Griffin and Knight, 1990), equation 1.0 presents a functional relationship between human capital development and exogenous variables;

HCDt = f(SCH, NUE, NPU, PUT, POP, LAB)

1.0

Expressing equation (1.0) in its linear form, it becomes:

$$HCD_t = \propto_0 + \propto_1 SCH_t + \propto_2 NUE_t + \propto_3 NPU_t + \propto_4 PUT_t + \propto_5 POP_t + \propto_6 LAB_t + U_t$$

2.0

Where HCD, SCH, NUE, NPU, PUT, POP and LAB represent human capital development, school enrollment, number of universities education, number of private universities, private universities' contributions to tertiary education, population growth and labour force, respectively. Also, $\propto_0$, $\propto_I$ (i=1,2,3,4,5,6), and U_t are the intercept, slopes and error terms, respectively. The unit root was

examined within the Augmented Dickey-Fuller and Philip Peron tests. The Autoregressive Distributed Lag (ARDL) model, a time series model, was adopted in the study. The ARDL model approach was originally introduced by Pesaran and Shin (1999) and further extended by Pesaran et al. (2001). The strength of this technique lies in its ability to incorporate variables of different orders, and it significantly enhances the estimates' small sample features, irrespective of whether the time series is stationary or not. In addition, to avoid the problem of serial correlation and multicollinearity in the model, three models were estimated where each measure of private universities entered the ARDL model separately, and as such provides both robustness and sensitivity of the result. The frequency of the data is annual, covering the period between 1990 and 2020 (see Table 2.0).

Table 2.0: Description and Measurement of Variables

Variable	Symbol	Measurement	Definition	Source
Human Capital Development	HCD	GDP per capita, PPP (constant 2017 international $)	This is an economic metric that breaks down a country's economic output per person.	WB, 2022
Number of Universities Education	NUE	Total number of universities established and accredited	This is the total number of universities owned in Nigeria	NUC, 2019
Number of Private Universities	NPU	Total number of private universities established and accredited	This is the total number of private universities owned in Nigeria	NUC, 2019
Private Universities to Tertiary	PUT	Private Universities as a percentage of total universities	This is the percentage share of private universities to the total number of universities in Nigeria	NUC, 2019
School Enrollment	SCH	Average index of school enrollment	This is the index of all levels of school enrolment in Nigeria	WB, 2022
Population growth	POP	Population growth (annual %)	This is the population growth rate from year t-1 to t, expressed as a percentage.	WB, 2022
Labour Force	LAB	Labour force participation rate	This is the labour force participation rate, total (% of total population ages 15-64) (modelled ILO estimate)	WB, 2022

Source: Authors Compilation (2024)

Where HCD, NUE, NPU, PUT, SCH, POP and LAB represent Human Capital Development, Number of Universities Education, Number of Private Universities, Private Universities to Tertiary, School Enrolment, Population Growth and Labour Force, respectively.

Result and Discussion

Pretest Result

To explain the role of private universities in Nigeria's human capital development, three variables were used to capture private universities in Nigeria. The description of the indicators used is handsel in Table 3.0 with results showing the consistency of the series. In particular, within the study scope, there are zero (0) private universities in Nigeria as evidenced by the minimum value at the beginning of the study. Meanwhile, at the end of the study scope, there are 79 private universities in Nigeria as evidenced by the maximum value. On average, 27 private universities have been added to Nigeria's tertiary education system. This is an indication that the depth and access to education in Nigeria have been enthusiastically embraced by policymakers and remain one of the strong pillars of human capital development. The result of the correlation matrix is reported in Table 4.0 with evidence that the correlation lies between 0 and 1 which is not unexpected. Meanwhile, variables with high correlation are not implemented on the same model. The results on the stationarity of the series are presented in Table 5.0 with the ADF and the PP tests revealed that all variables are integrated of order I(0) or I(1).

Table 3.0: Descriptive Statistics

	HCD	NPU	PUT	SCH	NUE	LAB	POP
Mean	4028.482	27.41935	22.70815	65.81221	83.61290	59.40448	2.610539
Median	3951.183	22.00000	29.48718	63.49612	73.00000	60.13800	2.602869
Maximum	5429.100	79.00000	46.47059	94.46262	170.0000	60.53900	2.764062
Minimum	2895.351	0.000000	0.000000	41.56938	30.00000	55.24000	2.440609
Std. Dev.	942.4175	28.42625	18.88587	15.58483	48.86285	1.490004	0.095797
Skewness	0.132378	0.549946	-0.078180	0.294060	0.503354	-1.515655	-0.007284
Kurtosis	1.375529	1.855084	1.266831	2.068777	1.781858	4.060867	1.689302
Jarque-Bera	3.499125	3.255768	3.911583	1.566872	3.225719	13.32260	2.219267
Probability	0.173850	0.196345	0.141452	0.456834	0.199317	0.001279	0.329680
Sum	124882.9	850.0000	703.9526	2040.179	2592.000	1841.539	80.92672
Sum Sq. Dev.	26644523	24241.55	10700.28	7286.611	71627.35	66.60338	0.275311
Observations	31	31	31	31	31	31	31

Source: Authors Compilation (2024)

Where HCD, NUE, NPU, PUT, SCH, POP and LAB represent Human Capital Development, Number of Universities Education, Number of Private Universities, Private Universities to Tertiary, School Enrolment, Population Growth and Labour Force, respectively.

Table 4.0: Correlation Matrix

Correlation Probability	HCD	NPU	PUT	SCH	NUE	LAB	POP
HCD	1.000						

NPU	0.931***	1.000					
	(0.000)	-----					
PUT	0.955***	0.942***	1.000				
	(0.000)	(0.000)	-----				
SCH	-0.383**	-0.334*	-0.478***	1.000			
	(0.033)	(0.066)	(0.007)	-----			
NUE	0.939***	0.997***	0.944***	-0.338*	1.000		
	(0.000)	(0.000)	(0.000)	(0.064)	-----		
LAB	-0.716***	-0.668***	-0.588***	0.081	-0.697***	1.000	
	(0.000)	(0.000)	(0.000)	(0.666)	(0.000)	-----	
POP	0.144	-0.135	0.167	-0.401*	-0.114	0.161	1.000
	(0.4412)	(0.4701)	(0.369)	(0.026)	(0.541)	(0.386)	---

Source: Authors Computation (2024). Where () are probability value and *, ** and *** are 10%, 5% and 1% significant level respectively.

Where HCD, NUE, NPU, PUT, SCH, POP and LAB represent Human Capital Development, Number of Universities Education, Number of Private Universities, Private Universities to Tertiary, School Enrolment, Population Growth and Labour Force, respectively.

Table 5.0: Unit Root Results

	ADF			PP		
	Level	**First Difference**	**Remark**	**Level**	**First Difference**	**Remark**
HCD	-3.1587**		**I(0)**	-0.6299	-2.3089*	**I(1)**
NUE	-1.7461	-4.4159***	**I(1)**	-1.6456	-4.4001***	**I(1)**
SCH	-2.8041*		**I(0)**	-2.8533*		**I(0)**
NPU	-1.3692	-5.4338***	**I(1)**	-1.4284	-5.4519***	**I(1)**
PUT	-0.3673	-6.8283***	**I(1)**	-0.4195	-6.6473***	**I(1)**
POP	-2.1833	-3.5607**	**I(1)**	-0.9293	-2.8963*	**I(1)**
LAB	-2.1939	-4.1396***	**I(1)**	-1.6265	-2.9009*	**I(1)**

Source: Authors Computation (2024). *, ** and *** are 10%, 5% and 1% significant level.

Where HCD, NUE, NPU, PUT, SCH, POP and LAB represent Human Capital Development, Number of Universities Education, Number of Private Universities, Private Universities to Tertiary, School Enrolment, Population Growth and Labour Force, respectively.

ARDL Bound Test Result

Since the stationarity level of the series has been established, we proceeded to estimate the test of long-run cointegration via the ARDL Cointegration test. The results of the long-run relationship are presented in Table 6.0 with evidence that all F-statistics within four (4) variables implemented are greater than the upper critical and lower critical values at 5% levels of significance. Hence, we conclude that there is long-run cointegration between human capital development and private universities in Nigeria. Thus, we proceed to long-run ARDL estimation. The long-run relationship shows that, even while shocks that produce disequilibrium may lead the variables to react differently in the short term, they usually converge in the long term following initial shocks.

Table 6.0: Bound Test Result

	Model I	**Model II**	**Model III**
F-statistics	18.2741	17.5192	14.8386
K	4	4	4
1% Upper Bound	5.06	5.06	5.06
5% Upper Bound	4.01	4.01	4.01
10% Upper Bound	3.52	3.52	3.52
1% Lower Bound	3.74	3.74	3.74
5% Lower Bound	2.86	2.86	2.86
10% Lower Bound	2.45	2.45	2.45

Source: Authors Computation (2024).

The result of the ARDL

The study presents the ARDL estimates in Table 7.0. The long and short-run coefficients of the number of universities have direct and significant contributions to the HCD in Nigeria. A 1-unit increase in the universities spurred HCD by 15.58 in the long term and 5.89 in the short term. The findings accentuate that the number of universities, which measures the total number of universities owned, increases the HCD. The number of universities rises due to the demand for education, which puts pressure on government investment and allows more and more young people to express a desire to attend university to gain knowledge and skills. The continued pressure on government investment and young people to express a desire to attend university to gain knowledge and skills enhances human capital development. This submission corroborates with Okotoni and Adebakin (2015), who conclude that less than thirty per cent of eligible applicants were able to secure admission to universities.

The number of private universities has a significant positive role in Nigeria's HCD. Regarding coefficient estimates, a unit increase in the number of private universities increases HCD by 26.19 in the long term and 3.59 units in the short term. The strength of the parameters is quite substantial, suggesting that the role of private universities tends to mob up the deficiency from the federal-owned and state-owned accredited universities. It can be concluded from this result that the privatization of university education enhances great social returns through the increase in the number of private universities and HCD in development plans. In addition, the findings accentuate that the transfer of education from being owned by the state to being owned by private companies facilitates great HCD. This result is not unexpected and aligns with the submissions of scholars.

Private universities to tertiary education have a direct and significant contribution to HCD in the development plans. This implies that a 1% rise in private universities as a percentage of tertiary universities increases the HCD to 37% in the long term and 2% in the short term. The result from private universities as a percentage of tertiary universities hints that the contributions made by education as a result of privatization are inexhaustible. Specifically, the outcome reveals that the applicants gain more access to education which assists in promoting HCD. Furthermore, this finding implies that the tertiary enrolment rate could be increased due to the contributions of private universities. This result is in agreement with the existing findings of Okotoni and Adebakin (2015).

Regarding school enrolment, the result shows that there is an indirect and insignificant contribution of the HCD in the development plans. Thus, a 1 unit increase in school enrolment leads to a persistent fall in HCD in both periods across the models. The reason could be that the education system, as evidenced by school enrolment, has not been developed to build individual capacity in semi-formal and informal skills and abilities that will enhance HCD and as such, there is an adverse relationship

between school enrollment and HCD. For school enrollment to have a positive and significant influence on HCD, university education must be built to accommodate informal skills and abilities. Similarly, the labour force has an inverse and significant contribution to the HCD in the development plan. Meanwhile, population growth has a direct and significant contribution to the HCD in both the long term and the short term. In addition, when private universities have not been examined in Nigeria's education sector, population growth may establish a negative relationship with HCD. The role of private universities spurred human capital development in Nigeria.

The balanced link between the variables is further confirmed by the error correction term (Ect(-1)), which shows that the model corrects its short-run instability and returns to its steady-state path by 4% yearly across all models. All post-model procedures were within the acceptable region of the ARDL model, allowing conclusions to be made. The diagnostic presented in Table 8.0 revealed that the models are suitable and adequate to explain the HCD in Nigeria. Specifically, the assumption of models such as the serial correlation test of Breusch-Godfrey, and the Breusch-Pagan-Godfrey test used to scrutinize the heteroscedasticity satisfy the conditions for the assumption to be held within the probability value greater than 0.05. in addition, the CUSUM and CUSUM of squares test in Figure 4.0, and Figure 5.0 show that the parameters are stable.

Table 7.0: ARDL Estimate

Dep: HCD	**Model I**	**Model II**	**Model III**
LONG-RUN			
NUE	15.5806 (1.1809)***		
NPU		26.1893 (2.0223)***	
PUT			37.6509 (3.8477)***
SCH	-0.2186 (3.3257)	-1.1267 (3.4720)	-1.9875 (4.4592)
POP	5.4707 (8.5981)***	5.79802 (9.4122)***	3.90393 (1.20951)***
LAB	-77.7273 (40.6111)*	-111.11 (40.2153)**	-123.626 (49.465)**
SHORT-RUN			
NUE	5.8963 (1.5256)***		
NPU		3.5855 (4.5322)	

		6.2977	
NPU(-1)		(3.9719)	
			2.4846
PUT			(4.5291)
			9.6491
PUT(-1)			(4.8798)*
	-0.0827	-0.4252	-0.6405
SCH	(1.2548)	(1.2865)	(1.4082)
	-1.1222	1.74219	-5.7257
POP	(5.7249)	(5.7838)	(6.6042)
	2.1826	2.1705	1.83068
POP(-1)	(6.123)***	(6.2245)***	(6.299)***
	3.22403	2.62687	2.2987
LAB	(2.1429)	(2.18706)	(2.3176)
	-61.655	-68.199	-42.139
LAB(-1)	(23.984)**	(24.962)**	(24.949)
	-0.3784	-0.3774	-0.3223
CointEq	(0.0364)***	(0.0369)***	(0.0343)***
Diagnostics			
R-squared	0.9958	0.9958	0.9953
Adjusted R2	0.9945	0.9943	0.9936
F-stat	746.67	630.03	560.3
Prob Value	0.000	0.000	0.000

Note: *, ** and *** are 10%, 5% and 1% significant levels.

Where HCD, NUE, NPU, PUT, SCH, POP and LAB represent Human Capital Development, Number of Universities Education, Number of Private Universities, Private Universities to Tertiary, School Enrolment, Population Growth and Labour Force, respectively.

Table 8.0: Residual Estimate

		Model I	**Model II**	**Model III**
Serial Correlation	**F-stat**	0.8471	1.7187	0.3441
	Prob Value	0.4435	0.2060	0.7132
Heteroskedasticity	**F-stat**	0.8593	1.5195	0.5315
	Prob Value	0.5525	0.2097	0.8196

Source: Author's Computation (2024)

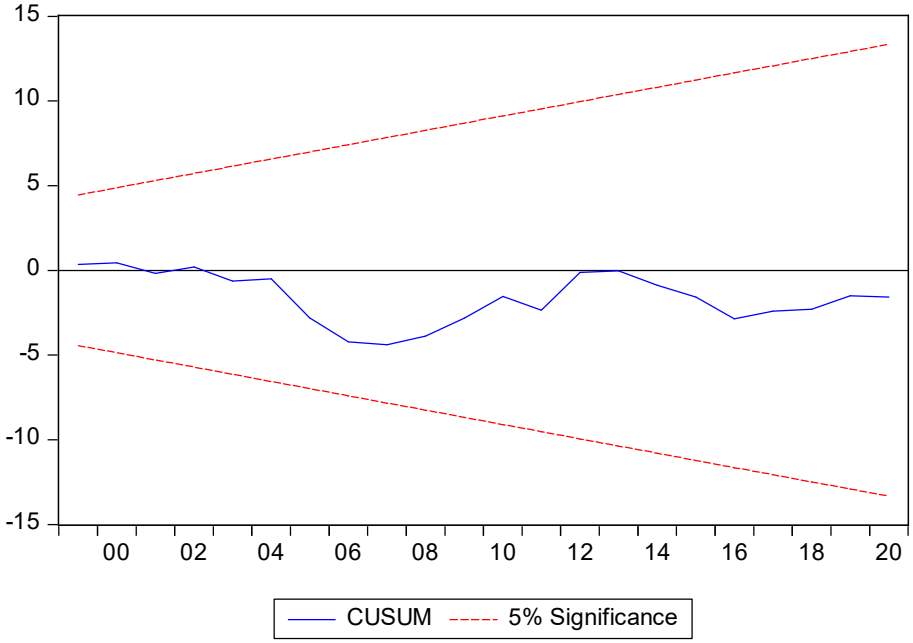


Figure 4.0: CUSUM Stability Result for Model I

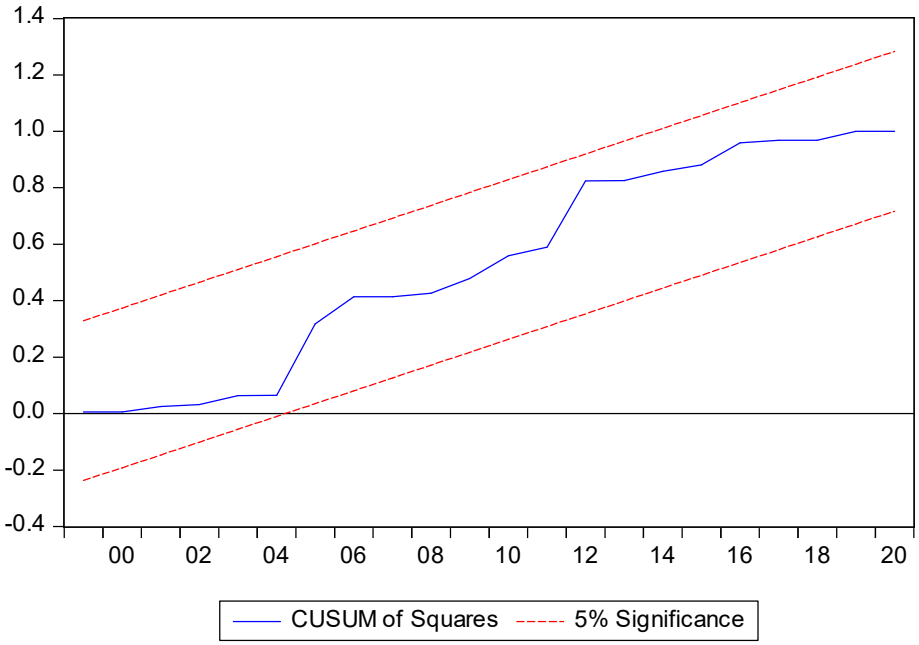


Figure 5.0: CUSUMSQ Stability Result for Model I

Conclusion

The stability, depth and access to education are enhanced by the tertiary institutions particularly the private universities in Nigeria. Over the years, studies have paid little or no attention to the role of tertiary institutions towards human capital development in Nigeria. However, the limited research that exists now in this area has overlooked the role of private universities in the discourse between tertiary institutions and HCD in Nigeria, which has an exponential growth over the last twenty years. Hence, this paper investigates the link between tertiary institutions, private institutions and human capital development in Nigeria for 1990-2020 within an estimation of the ARDL approach. The ARDL strength lies in its ability to incorporate variables of different orders and it significantly enhances the estimates' small sample features, irrespective of whether the time series is stationary or not. For the robustness check, three measures are used to explain the role of private universities in the trajectory of tertiary institutions- HCD nexus.

The findings reveal that tertiary institutions particularly private institutions matter in the discourse of Nigeria's human capital development. Specifically, the result shows that the short- and long-run estimation of the number of universities, the number of private universities, and private universities as a percentage of universities increase human capital development, contributing significantly to Nigeria's stability, depth and access to education. However, school enrolment, population growth and labour force had adverse influences on Nigeria's HCD in the short and long run. Thus, the education system has not been developed to build individual capacity towards semi-formal and informal skills and abilities.

The study recommends that tertiary institutions' curricula be developed beyond reading, writing and arithmetic with inclusive capacity for skills and abilities. Hence, the study concluded that private institutions matter in human capital development discourse.

The findings of the present investigation have some contributions to the policy. First, tertiary institutions' curricula be developed with inclusive capacity for skills and abilities. In addition, policymakers should focus on factors contributing to increasing stability, depth and access to education which spur HCD in Nigeria. Since the rise in the number of universities, the number of private universities, and private universities as per cent of universities, in most cases, increases human capital development, innovations and government intervention should be deployed to create an enabling environment in terms of infrastructure and security. With this, the HCD will be increased in education quality and access to tertiary education.

These are the research's shortcomings. First, the results of this research are limited to Nigeria. Secondly, economic metrics per individual were used as the measure to assess human capital development, and thirdly, a few variables within the education sector were assessed as the enabler of human capital development. By broadening the focus or

study comparisons of other rising nations, subsequent research can get beyond these restrictions. Additionally, other metrics can be included in this evaluation of HCD (gross national income, school enrollment, life expectancy, employment level) Lastly, other enablers of human capital development can be designed following various theoretical standpoints.

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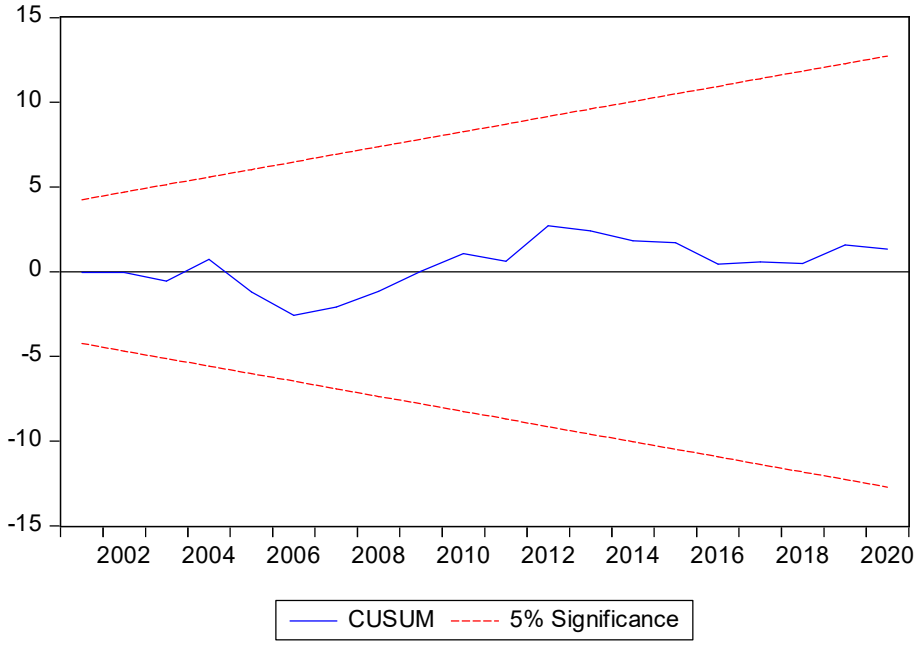
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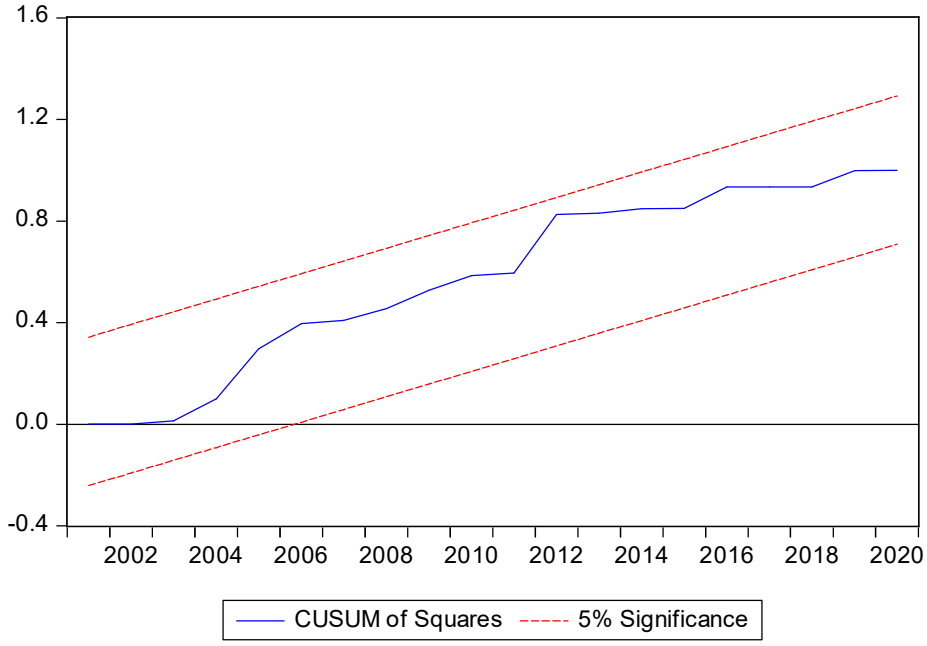
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Appendix

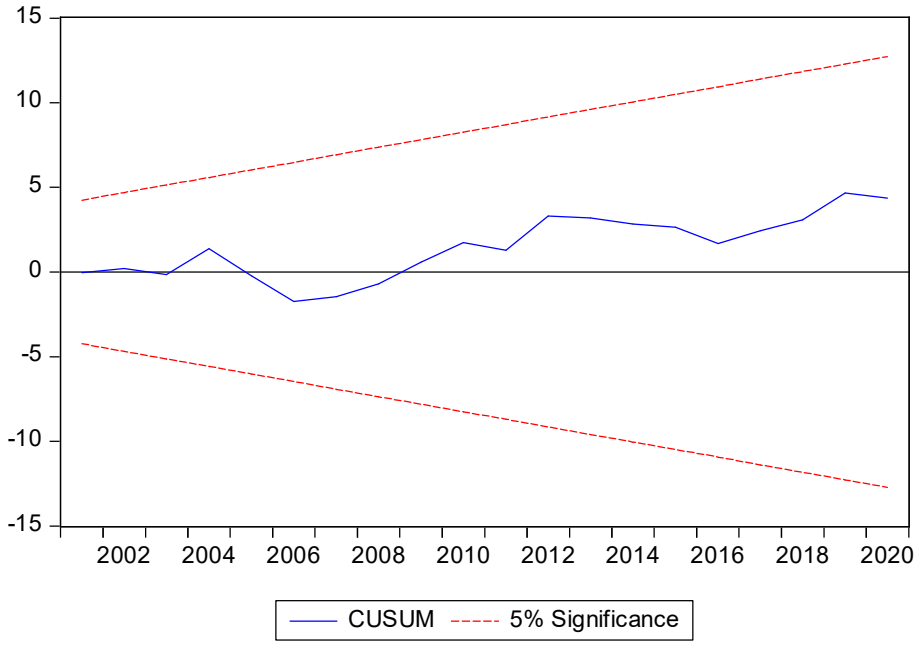
Appendix I: CUSUM Stability Result for Model II



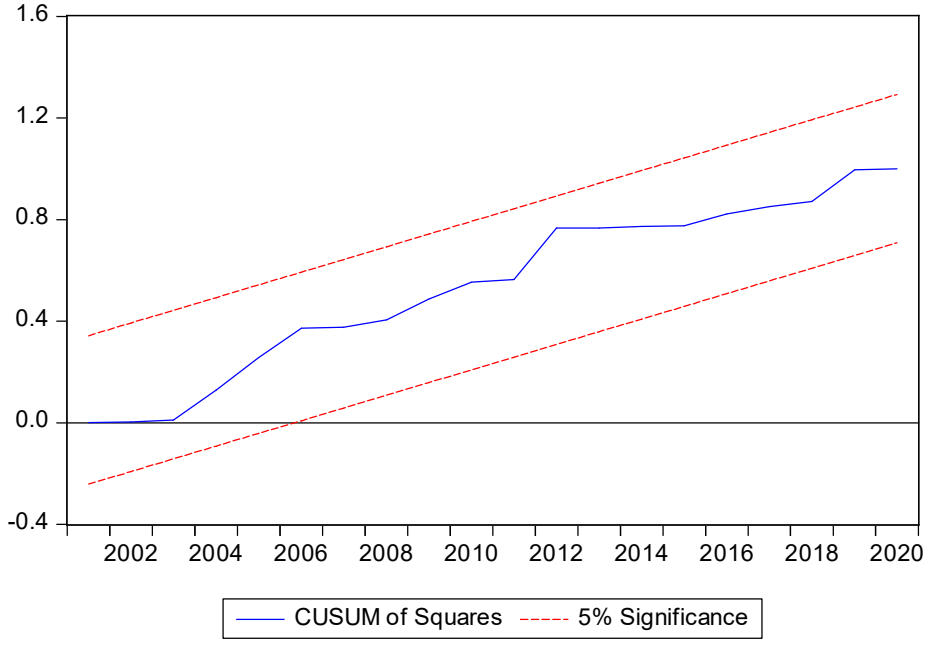
Appendix II: CUSUMSQ Stability Result for Model II



Appendix III: CUSUM Stability Result for Model III



Appendix IV: CUSUMSQ Stability Result for Model III



Appendix V List of Abbreviations

UNESCO	United Nations Educational Scientific Cultural Organization
UN	United Nations
NUC	National Universities Commission
UPE	Universal Primary Education
HDI	Human Development Index
UNDP	United Nations Development Program
WB	World Bank
HC	Human Capital
ESA	Education Sector Analysis
ARDL	Autoregressive Distributive Lag
ILO	International Labour Organization
ADF	Augmented Distributive Lag
PP	Philip Peron
HCD	Human Capital Development