

## Human Capital Development, Healthcare Financing And Institutional Quality In Nigeria

Anthony Gabriel POCHO<sup>1</sup>, Inusa Utiwore MATUDI<sup>2</sup>

Department of Economics, Federal University of Lafia, Lafia, Nasarawa State Nigeria<sup>1</sup>

Department of Economics, Federal University, Wukari, Wukari Taraba State, Nigeria<sup>2</sup>

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### Article Info

#### Article history:

Received : 15 December 2025

Revised : 06 January 2026

Accepted : 20 January 2026

Available online : 31 January 2026

#### Keywords:

Educational expenditure,  
healthcare expenditure,  
Institutional Quality ARDL.

### ABSTRACT

Human capital development, healthcare financing and institutional quality are key variables that affect the growth of the economy, especially for a developing economy which Nigeria belongs to. This study interrogates the nexus between human capital development, healthcare financing and institutional quality in Nigeria between 1996 to 2023. Using the Auto Regressive Distributed Lag (ARDL) model approach. Outcome indicated that; futuristically, educational expenditure exhibited positive and significant effect on institutional quality index in Nigeria. Additionally, healthcare expenditure exhibited negative and significant effect on institutional quality in Nigeria. And out of pocket expenditure showed negative and insignificant effect on institutional quality in Nigeria. However, in the short run, outcome indicated that, healthcare expenditure exhibited negative and significant effect on institutional quality in the short run, on the other hand, out of pocket expenditure showed to have positive and insignificant effect on institutional quality index. On this premise, the study suggested that concern authorities should revisit Nigeria's healthcare financing model, strive to enhance budgetary allocation to the educational and health sector this might improve the quality of human capital and improve the aggregate health of the citizens. Nigeria needs strong institutions to manage funds allocated to the educational and health sector effectively.



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### Corresponding Author:

**Anthony Gabriel POCHO**

Department of Economics, Federal University of Lafia, Lafia,  
Nasarawa State Nigeria

Email: Pochotony3@gmail.com

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### INTRODUCTION

Globally, human capital development, healthcare financing, and institutional quality are identified as critical pillars of sustainable economic and social progress. Investments in human capital comprising education, health, and skills enhancement are recognized as critical drivers of productivity, innovation, and inclusive growth ([World Bank, 2023](#)). Furthermore, healthcare financing, provides the monetary resources necessary to improve health of the population, although it varies widely but increasingly emphasizes sustainable, efficient mechanisms beyond out-of-pocket payments ([WHO, 2022](#)). Therefore, worldwide health system requires robust and diverse financing mechanisms to ensure universal health coverage and resilience against shocks, while strong institutions underpin the efficient allocation and

utilization of resources, transparency, and governance effectiveness ([WHO, 2024](#)). On the other hand, institutional quality, particularly governance and accountability, shapes the effectiveness and equity of these investments and resource allocations, strengthening health systems and human capital outcomes ([Kaufmann et al., 2010](#)).

Human capital, healthcare financing and institutional quality interconnect with unique challenges such as limited financial resources, infrastructural deficits, and governance issues in the African Continent. The continent's health financing still largely depends on out-of-pocket spending, international donor funding, and nascent health insurance schemes, which hinder universal health coverage (UHC) goals ([African Development Bank, 2023](#)). Institutional weaknesses worsen inefficiencies and inequities in service delivery, constraining the potential of human capital to drive sustainable development ([UNECA, 2021](#)). West Africa exemplifies this complexity, where countries have adopted diverse health financing reforms and policy frameworks aimed at reducing catastrophic health expenditures and improving institutional accountability ([ECOWAS Health Policy, 2024](#)).

Being the most populous nation in West Africa, Nigeria presents a complex and evolving landscape regarding human capital development, healthcare financing, and institutional quality. Although, the Nigerian government has implemented several policies to address these challenges, including the Basic Health Care Provision Fund (BHC PF), which aims to expand health insurance coverage and improve primary healthcare delivery. Despite significant increases in government spending such as the 58.53% rise in health sector funding in 2025, yet out-of-pocket spending is the dominant form of healthcare spending, accounting for over three quarters of total health spending. Complementary financing sources include health insurance schemes, both social and private, and donor funding from international partners like WHO, UNICEF, and the World Bank, which play crucial roles in supporting health infrastructure and services ([Federal Ministry of Health Nigeria, 2025](#); [DGIC, 2025](#)). Institutional reforms over the years have focused on digitization, performance based funding, and accountability mechanisms to enhance transparency, accountability and efficiency in resource allocation, but gaps in governance and fund compliance persist at subnational levels.

The interconnection among human capital development, healthcare financing, and institutional quality in Nigeria underscores a systemic relationship. Effective institutional quality enhances the efficiency and equity of healthcare financing mechanisms, which in turn enables improved health outcomes a core component of human capital. Improved human capital then contributes to economic productivity, creating a virtuous cycle crucial for national development ([Adamu, 2024](#)). However, the persistence of high out-of-pocket spending juxtaposed with underperforming institutional mechanisms reveals significant gaps undermining Nigeria's aspirations to achieve Universal Health Coverage (UHC) and sustainable human capital development.

Here the crux is embedded in Nigeria's policy frameworks and reforms aimed at improving healthcare financing and institutional governance, the heavy reliance on

out-of-pocket spending, inadequate health insurance coverage, and institutional weaknesses continue to hinder effective human capital development. This situation exacerbates health inequities and threatens the long-term socio-economic development of Nigeria. Therefore, this study seeks to investigate the dynamic relationships among human capital development, healthcare financing mechanisms, and institutional quality in Nigeria, with a focus on identifying how improvements in institutional governance and innovative financing can optimize human capital outcomes. The objective of this study is to examine critically the interrelationships between human capital development, healthcare financing, and institutional quality in Nigeria. This is with the aim of identifying policy gaps and proposing sustainable frameworks that can enhance the efficiency and effectiveness of healthcare financing to improve human capital outcomes in the Nigerian context.

According to the theory, public spending on the populace will bring about enhancement in the educational attainment and economic outcome of the citizens ([Musa, et al., 2023](#); [Becker, 1964](#)). According to [Dridi \(2014\)](#) in several ways the efficiency of government spending is affected by institutional quality. However, in an economy where the institutions are weak and corrupt, the rich of the economy will be influencing the system in their favour. With respect to human capital, spending for the educational sector might be negatively affected in an economy with poor institutional quality. In an economy where institutions are weak, government finds it challenging to collect tax and these affect social service spending ([Musa et al., 2013](#); [Dridi, 2014](#)). Diversion of resources for the educational sector can easily be done in an economy where institutions are weak, on the other hand, public servants might manipulate the procurement process to short change the public in service and project delivery ([Musa et al., 2013](#); [Haque & Kneller, 2015](#)). When the institutions are weak and corruption reigns, funds from foreign donors meant for education and health might be negatively affected especially regards the efficiency of project delivery and this will discourage donors in the future ([Musa et al., 2013](#); [Dridi, 2014](#)).

### **Empirical Review**

For [Anagun et al., \(2024\)](#) it was income inequality and human capital investment in Nigeria, the place of institutional quality between 1990 to 2021. The study employed the ARDL for estimation and outcome indicated that, in the future, public spending on health and education, effectiveness of government, domestic debt to non-public sector, exhibit non-negative unimportant impact on income inequality. However, in the interim, effectiveness of government, and domestic debt to non-public sector exhibit non-negative noteworthy impact on inequality in income. On these premise, the study submitted that relevant authorities should improve budgetary allocation to institutions that are saddled with responsibility to enhance human capital, such as health and education to mitigate inequality in income. While, quality of institutions and human capital development in Nigeria was interrogated by [Kudaisi \(2024\)](#) between 1990 to 2022. The study employed the use of ARDL for analysis and outcome

indicated that, stability of political system, accountability in the democratic space, enhanced per capita GDP, spending by government continually in key sectors and job creation together are key components in the development of human capital. This study highlighted the role of strong institutions in enhancing human capital development, furthermore, it improves education, enhance healthcare, alleviate poverty, job creation, and safer environment. Therefore, the study suggested that authorities should pursue policies that strengthens institutions for better human capital development outcomes.

With focus on inclusive growth in African nations [Ofori et al., \(2024\)](#) looked at impact of human capital development and quality of institutions in 43 countries between 2005 to 2020. Two-step system generalized method of moments (SYS-GMM) was employed for estimation. And the outcome indicated that, the improvement of human capital enhanced inclusive growth for African nations, however governance exhibit retarding effect. On the other hand, the indicators of good governance which are six exhibited non-negative influence on inclusive growth and human capital. This submits that non-positive governance dynamic forces wholly negate the non-positive impact on inclusive growth on human capital. On this premise the study suggested that, to attain the desired outcome for human capital development in Africa, there is need for Africa to improve on its weak institutions. While, the role of institutional quality in innovation and development in the financial sector was examined by Atsu and Adams (2023) between 1980 to 2019, for 40 nations within the OECD region. The study used generalised methods of moments (GMM) and the fully modified ordinary least squares (FMOLS) for estimation. The finding that emerged include, international trade, quality of institutions, human capital and financial development, enhance innovative happenings. On the other hand, FDI, exhibited a reverse outcome, and additional outcome submitted a non-linear connection between innovation and finance.

[Kamalu and Ibrahim \(2023\)](#) interrogated the role of quality institutions in financial access and development of human resource nexus in developing nations between 1996 to 2020. Fully modified ordinary least squares (FMOLS) and dynamic ordinary least squares (DOLS) were adopted for estimation. The following outcome emerged, financial access enhances futuristic human capital growth in developing nations. While institutional quality is key as it promotes non-negative impact on financial access on human capital development. On the other hand, public expenditure, quality of institution and foreign direct investment exhibit qualities that promotes development in human capital in the future. Therefore, the study suggested that, to promote development in human capital on a sustainable basis, authorities in developing nations should focus on policies that enhances access to finance for all in respective of location rural or urban. A study on global trade, quality institutions, jobs on environmental connection: Panel ARDL technique was carried out by [Tabassum et al., \(2023\)](#) using data from ten industrial nations between 2020 and 2021. Outcome indicated that, significant effect is exhibited by institutional quality on carbon dioxide emissions, furthermore, enhance institutional quality reduces carbon dioxide

emission. While employment, trade openness, exhibit important effect on carbon dioxide emission. The study thus submitted that outcome behoves on policy makers to birth policy aimed at environmental protection.

[Adeleye \(2023\)](#) critically examined inequality in income, human capital and institutional quality for sub-Saharan Africa between 2010 to 2019. The study employed panel spatial correlation consistent and unconditional quantile regression method. Outcome indicated that, human capital and institutional quality intensify income inequality, when they collaborate (human capital and institutional quality) reduces income inequality. Furthermore, unconditional quantile regression outcome showed collaboration is non-positive at the lower level, while sub-regional outcome indicated mixed outcome. On these premise, the study recommended that relevant authorities should strive I promoting inexpensive basic education. International financial resource flow, quality of institutions and human capital growth in sub-Saharan Africa was examined by [Githaiga and Kilog'i \(2023\)](#) between 2009 to 2019. For estimation generalized methods of moments (GMM) was explored. Outcome showed that non-negative link exists among remittances, foreign direct investment, institutional quality and human capital development. While official development assistance indicated non-positive noteworthy impact on human capital development. Furthermore, institutional quality was moderated by remittances and foreign direct investment.

The place of institutional quality on health outcome based on panel data from 158 nations was examined by [Hadipour et al., \(2023\)](#) between 2001 and 2020. The study employed generalised method of moments (GMM) model for data analysis, outcome showed that institutional quality exhibited non-positive influence, while infant mortality rate has non-negative influence on life expectancy. Economic growth exhibited non-positive connection with infant mortality rate and non-negative connection with life expectancy. On the other hand, infant mortality rate and life expectancy experience a positive and negative effect respectively from log of CO2 emission. Therefore, the study suggested that institutional quality be enhanced especially for high income nations to improve health outcome. The collaboration between human capital development and quality institutions in guiding the changes in financial system of Viet Nam was examine by [Enrico and Tran \(2018\)](#) between 2003 to 2014. The study employed system generalized method of moments for estimation. The following findings emerged; the financial system in Viet Nam showed balance between trade-off theory and the perking order theory. While, access to corporate credit is scarce for youths and non-formal businesses. Furthermore, businesses with access to credit used their advantage at the detriment of the tax system and cause distress in the financial sphere. Additionally, gains and tax credit cover do not benefit businesses in the non-formal sector in credit financing. Institutional quality encourages open debt circulation and will reduce business reliance on credit financing. Human capital development promotes the ability of business people to seek for additional credit couple with institutional quality it prevents credit financing and promotes additional finance channel.

## METHODS

### Model Specification

The model for this study is derived from the theoretical framework which is the human capital theory. Therefore, an econometric model derived from the human capital theory to analyse the association between human capital, healthcare financing and institutional quality in Nigeria can be formulated as a growth or productivity function where economic output is directed by investment in healthcare and education (human capital), health financing mechanism and institutional quality indicators. The model according to Osoba (2017) and Akpoghelie (2016) links with empirical works that extends the augmented Solow growth framework with human capital and institutional quality variables. However, the model is modified for the purpose of this study.

The model can be specified thus;

$$Y_t = \beta_0 + \beta_1 HC_t + \beta_2 HF_t + \beta_3 IQI_t + \beta_4 X_t + \epsilon_t \text{-----} 1$$

**Where:**  $Y_t$  = This is an econometric output for growth.  $HC_t$  = Human capital development, (Public spending on education and health).  $HF_t$  = Healthcare financing (include; out of pocket spending and public spending on health).  $IQI_t$  = Institutional quality indicator (Include; indices of governance, perception of corruption, regulatory quality and political stability).  $X_t$  = For vector of control variables (capital investment).  $\epsilon_t$  = Error term capturing unexplained variation. But for this study the model is specified thus.

Econometric specification of the model;

$$IQI_t = \beta_0 + \beta_1 EE_t + \beta_2 HE_t + \beta_3 OPE_t + \beta_4 GCF_t + \epsilon_t \text{-----} 2$$

**Where:**  $IQI$  = Institutional quality index,  $EE$  = Educational expenditure,  $HE$  = Health expenditure,  $OPE$  = Out of pocket expenditure,  $GCF$  = Gross capital formation,  $\epsilon_t$  = Stochastic term.

### Data Source.

Institutional Quality Index (IQI) data was formulated using Principal Component Analysis (PCA) with six institutional quality indicators; control of corruption (CC), government effectiveness (GE), political stability (PS), regulatory quality (RQ), rule of law (RL) and voice and accountability (VA). Data for this procedure were sourced from the World Development Indicator (WDI) of the World Bank. Other data were sourced from Central Bank of Nigeria (CBN) Statistical Bulletin; EE (educational expenditure), HE (healthcare expenditure) and GCF (gross capital formation), while OPE (out of pocket expenditure) was sourced from the WDI.

### Autoregressive Distributed Lag Model (ARDL)

The data for this study are time series data which might involve the possibility of non-stationarity, however the ARDL is appropriate as it takes care of variables with mix stationarity I(0) or I(1) and captures both the long run and short run dynamics. Therefore, the ARDL model for the equation (2) can be specified thus;

$$\begin{aligned} \Delta IQI_t = & \alpha_0 + \sum_{i=1}^p \delta_i \Delta \ln IQI_{t-i} + \sum_{k=0}^p \beta_k \Delta \ln EE_{t-i} + \sum_{l=0}^p \gamma_l \Delta \ln HE_{t-i} \\ & + \sum_{l=0}^p \gamma_l \Delta \ln OPE_{t-i} + \sum_{k=0}^p \beta_k \Delta \ln GCF_{t-i} + \lambda_1 \ln IQI_{t-1} + \lambda_2 \ln EE_{t-1} \\ & + \lambda_3 \ln HE_{t-1} + \lambda_4 \ln OPE_{t-1} + \lambda_5 \ln GCF_{t-1} + \mu_t \end{aligned} \quad \text{-----} \quad -3$$

## ANALYSIS OF RESULT

### Unit Root Test

**Table 1.** Augmented Dickey Fuller (ADF) Unit Root Test Result

Variable	T-stat	Prob. Value	Stationarity
IQI	-4.123253	0.0036	I(0)
EE	-4.577947	0.0013	I(1)
HE	-6.004018	0.0000	I(1)
OPE	-11.71941	0.0000	I(1)
GCF	-5.323738	0.0003	I(1)

Source: Authors computation with extract from E-Views

**Table 2.** Phillip Peron (PP) Unit Root Test Result

Variable	T-Stat	Prob. Value	Stationarity
IQI	-4.400194	0.0018	I(0)
EE	-4.577947	0.0013	I(1)
HE	-6.564221	0.0000	I(1)
OPE	-5.191876	0.0003	I(1)
GCF	-4.836540	0.0006	I(1)

Source: Authors computation with extract from E-Views

Outcome of the unit root test for both ADF and PP in Table 1 and 2 indicated a mix order of stationarity, educational expenditure, healthcare expenditure, out of pocket expenditure, and gross capital formation were stable at first difference, while institutional quality index was stable at level. Therefore, this justifies the use of ARDL as method of estimation.

**Table 3.** Cointegration Test Result

Model Specification	F-Stat	K	Lower Bound	Upper Bound	Conclusion
ARDL	11.56714	4	2.56	3.49	Cointegration

Source: Authors computation with extract from E-Views

The result of the cointegration test in Table 3, showed that the F-statistics is greater than the upper and lower bound at 5%. This implies there is cointegration (Long run relationship) between the variables; human capital development, healthcare financing and institutional quality in Nigeria.

**Table 4.** Long and Short Run ARDL Result

<b>Variable</b>	<b>Coefficient</b>	<b>P-Value</b>
<b>C</b>	10.09248	0.4907
<b>LIQI (-1)</b>	-0.828663	0.0000
<b>LEE</b>	2.318011	0.0204
<b>LHE(-1)</b>	-1.963896	0.0274
<b>LOPE (-1)</b>	-3.450006	0.3209
<b>LGCF</b>	0.077993	0.6553
<b>D(LHE)</b>	-1.194177	0.0005
<b>D(LOPE)</b>	0.249853	0.8652
<b>CointEg(-1)</b>	-0.828663	0.0000
<b>R-squared</b>	0.815459	
<b>A-R-Squared</b>	0.762132	
<b>D. Watson</b>	1.799698	
<b>Prob. Stat.</b>	0.001427	

**Source:** Authors computation with extract from E-Views

The long term implication of the ARDL model in Table 4 indicated that, educational expenditure (EE) has positive and significant effect on institutional quality index in Nigeria in the future. For healthcare expenditure (HE) in the first lag the effect on institutional quality index is negative and significant. While out of pocket expenditure (OPE) in the first lag indicates negative and insignificant effect on institutional quality index. Gross capital formation (GCF) exhibited positive and insignificant effect on institutional quality index in the long run. However, in the interim, it is healthcare expenditure, and out of pocket expenditure that has effect on institutional quality in Nigeria within the study period. Healthcare expenditure exhibited negative and significant effect on institutional quality in the short run, on the other hand, out of pocket expenditure showed to have positive and insignificant effect on institutional quality in the short run. The error correction model indicated a negative coefficient (-0.828663) and significant, this implies that the model will adjust to equilibrium at a rate of 0.82% a year after. Overall, result showed that the independent variables; educational expenditure, healthcare expenditure, out of pocket expenditure and gross capital formation explained about 81% of the aggregate variations on institutional quality index, while the remaining 19% is captured by the error term. Outcome of the probability value also indicates that the model is robust.

## POST DIAGNOSTIC TEST RESULT

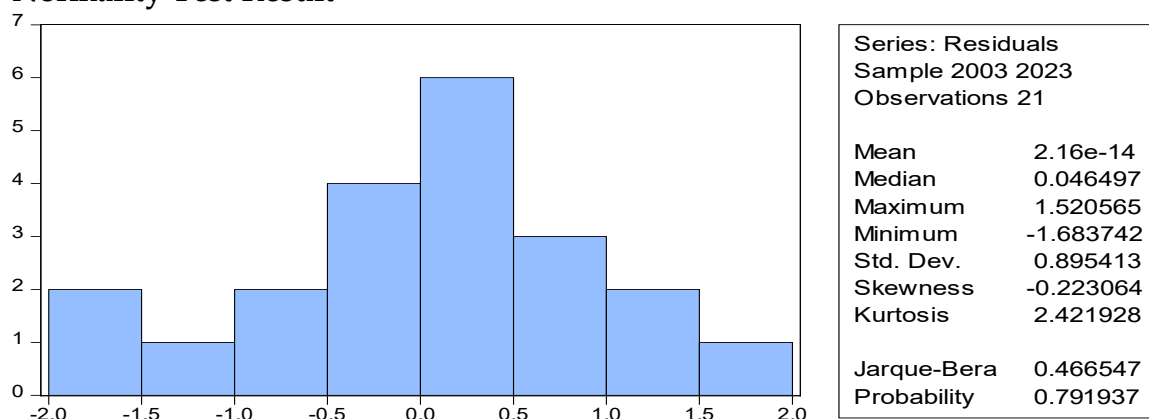
**Table 5.** Correlation Result of the Institutional Quality Indicators

	CC	GE	PS	RL	RQ	VA
CC	1.000000					
GE	-0.821008	1.000000				
PS	0.776859	-0.758181	1.000000			
RL	-0.498950	0.614142	-0.681229	1.000000		
RQ	-0.764357	0.572711	-0.955219	0.726760	1.000000	
VA	0.637853	-0.608098	0.347499	-0.606374	-0.673229	1.000000

Source: Authors computation with extract from E-Views

The outcome of the ordinary correlation result in Table 5 indicates that there is correlation between the six institutional quality indicators. Therefore, they indicators are robust for building institutional quality index.

### Normality Test Result



**Figure 1.** Normality Test

Outcome of Figure 1 indicates that, the Jarque-Bera statistics is higher than 0.05%, this is an indication that, the residual from the regression is normally distributed. This test outcome confirms the robustness of the regression.

### Serial Correlation Test Result

**Table 6.** Serial Correlation Test Result

**Null Hypothesis: No serial correlation**

F-statistics	0.954330	Prob. F(2, 7)	0.4300
Obs*R-squared	4.499201	Prob. Chi-square (2)	0.1054

Source: Authors computation with extract from E-Views

Result of the serial correlation test in Table 6 is an indication of the absence of serial correlation in the model used for the study, this is because the probability value is

greater than 0.05% level of significance.

**Heteroskedasticity Test Result**

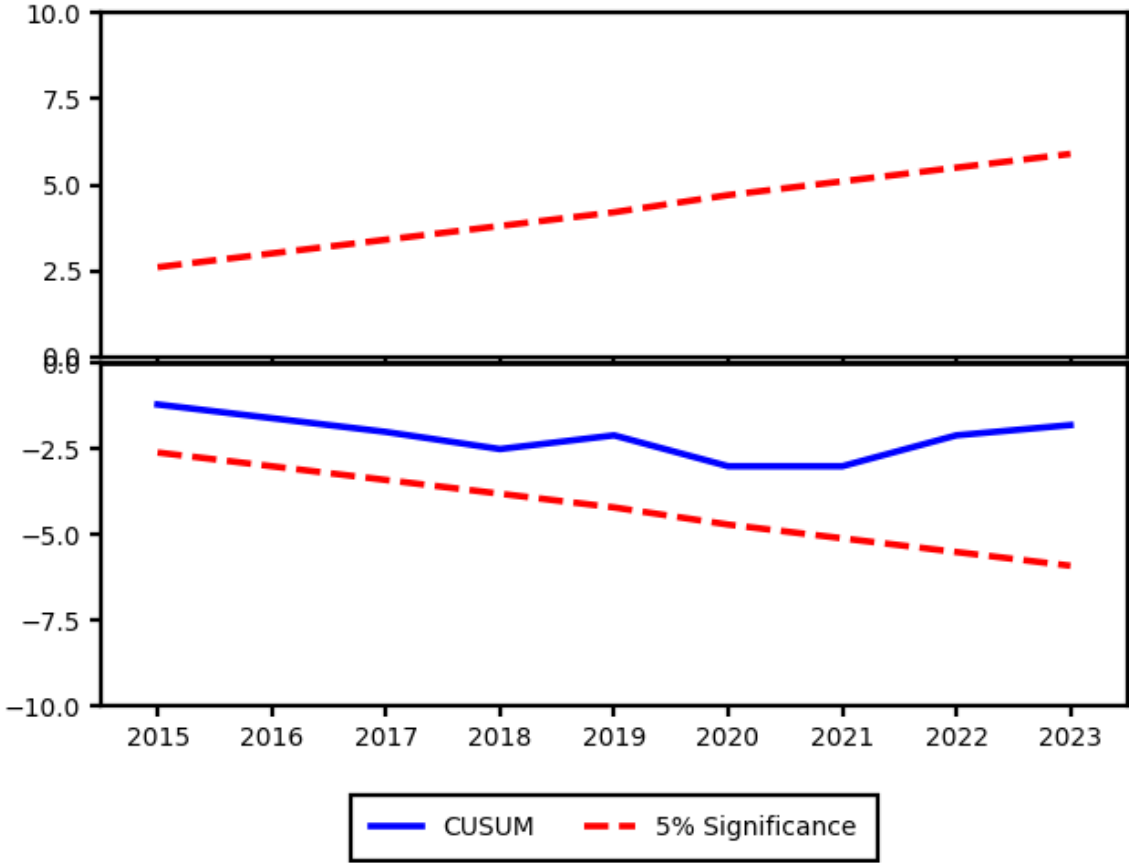
**Table 7. Heteroscedasticity Result**  
Null hypothesis: No Heteroskedasticity

<b>F-statistics</b>	<b>0.658877</b>	<b>Prob. F(11, 9)</b>	<b>0.7466</b>
<b>Obs*R-squared</b>	<b>9.367546</b>	<b>Prob. Chi-square (11)</b>	<b>0.5880</b>
<b>Scaled explained SS</b>	<b>1.223264</b>	<b>Prob. Chi-square (11)</b>	<b>0.9999</b>

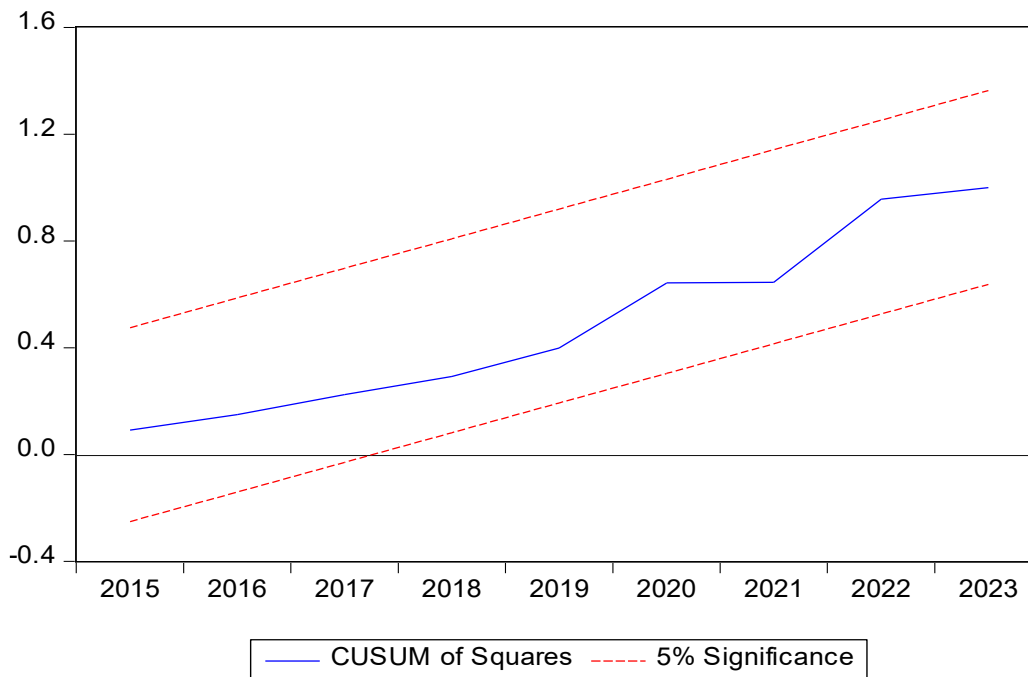
Source: Authors computation with extract from E-Views

Outcome of the heteroskedasticity test in Table 7 indicates that there is absence of heteroskedasticity in the model used for the study. This is because the probability value is higher than 0.05%.

**Stability Test Result**



**Figure 2. CUSUM Test**



**Figure 3.** CUSUM of Squares

Outcome of the stability test, CUSUM and CUSUM of Squares test in Figure 2 and 3 respectively showed that the model used for the study is dynamically stable as the blue lines in both cases are in between the two red lines.

### Discussion

Table 4 contains the estimates of human capital development, healthcare financing and institutional quality in Nigeria between 1996 to 2023 through the Principal Component Analysis (PCA) and Auto Regressive Distributed Lag (ARDL) model approach. The futuristic component indicated that, educational expenditure showed positive and significant effect on institutional quality index in Nigeria within the study period. This is an indication that, as public spending on education increases, it affects institutional quality in that more funds widens access to education thereby improve the capacity of the citizens which is visible in the quality of service delivered by public institutions. This can be considered as output of the increased expenditure on education. Furthermore, funds for education ease the process for receptivity of public policies as they concern the citizens, as it is easier to govern educated populace. Although, weak institutions might affect the flow of funds for effective implementation of policies to improve the quality of education. This is true especially in a corrupt system, the influential citizens might redirect funds meant for education or health for their selfish end. Healthcare expenditure indicated negative and significant effect on institutional quality index in Nigeria within the study period for the long run. This might imply healthy citizens contributes to the functionality of institutions in the long run, healthy and educated citizens contribute to the human capital of a given economy. Therefore, enhanced expenditure in the health and educational sector improves the human

capital of a given economy in the long run.

Out of pocket expenditure also exhibited negative and insignificant effect on institutional quality index within the study period, this is an indication that when people spend directly for their healthcare needs it affect institutional quality index in the negative light. Financing healthcare through channels like health insurance help to lessen the burden of healthcare on the households and gives people more time to focus on their livelihood activities. Although, Nigeria's health insurance scheme is yet to be fully develop so as to yield maximum outcome. For gross capital formation, it was not significant on institutional quality, this might imply inadequate capital generated over the years for investors to help promote industrial activities in Nigeria, this stifles economic participation of citizens in form of unemployment. Unemployed citizens cannot access health insurance and might lack sufficient funds to meet the healthcare needs. In summary, outcome for this study indicated that; educational expenditure exhibited positive and significant effect on institutional quality index in Nigeria. Additionally, the study found that, healthcare expenditure exhibited negative and significant effect on institutional quality in Nigeria. And out of pocket expenditure showed negative and insignificant effect on institutional quality in Nigeria. Outcome of this study can be likened to those of [Kamalu and Ibrahim \(2023\)](#) where they submitted that, financial access (increased educational and healthcare spending) enhances human capital growth in developing nations like Nigeria and of [Hadipour et al., \(2023\)](#) where they submitted that, institutional quality enhances health outcomes.

### CONCLUSION

The study examines the effect of human capital development, healthcare financing and institutional quality in Nigeria between 1996 to 2023. The study explored Principal Component Analysis (PCA) and Auto Regressive Distributed Lag (ARDL) model. The novelty of this study lies in its integrative approach that concurrently examines these three critical variables within the contemporary Nigerian context, providing evidence based insights for policymakers to refine healthcare financing strategies and institutional reforms that underpin sustainable human capital development. The following outcome emerged; educational expenditure exhibited positive and significant effect on institutional quality index in Nigeria. Additionally, healthcare expenditure exhibited negative and significant effect on institutional quality in Nigeria. And out of pocket expenditure showed negative and insignificant effect on institutional quality in Nigeria. While gross capital formation indicated positive and insignificant effect on institutional quality in Nigeria. In the short run however, outcome indicated that, healthcare expenditure exhibited negative and significant effect on institutional quality, on the other hand, out of pocket expenditure showed to have positive and insignificant effect on institutional quality. This implies that, human capital development and healthcare financing affects institutional quality in Nigeria. On these premise the following recommendations were made.

Relevant authorities should revisit Nigeria's healthcare financing model, intensify efforts to enhance budgetary allocation to the educational and health sector. Concern

authorities should set mechanism in place for a stronger institution in Nigeria.

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