

# Human Capital Development and Economic Growth in Africa

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## ABSTRACT

The study examined the human capital, and economic growth in Africa. Data used were collected over the period between 1987 and 2023 for 20 African countries. Panel data were analyzed using unit root test and autoregressive distributed lag model for long run and short run effects. Analysis was carried out on the combined countries as well as countries grouped into Blocs of North Africa, West Africa, East Africa, Central Africa and Southern Africa respectively. The result of the analysis showed that School enrolment and government expenditure on health exert insignificant positive impact of real gross domestic product growth rate, while government expenditure on education exert significant negative impact of real gross domestic product growth for combined sample of Africa countries. Also, on the long run, human capital variables including school enrolment, government expenditure on education and government expenditure on health has insignificant impact on real gross domestic product growth rate across all blocs though with varying magnitude and signs.

**Key Words:** Human capital, school enrolment, government expenditure, economic growth.

## INTRODUCTION

The significant of human capital as a factor that synchronizes all other production and economic variables, as well as one that influences income and job distributions, makes it essential to conduct study on the relationship between the human capital development and economic growth. The effectiveness and efficiency of a nation's efforts to develop its human capital indicate the degree of economic growth and prosperity in that nation. Technology development has been identified as one of the main forces behind long-term economic prosperity. Both Solow (1956) and Mankiw, Romer, and Weil (1992) have provided theoretical and empirical support for this. Consequently, in order to increase their level of technological efficiency, developing economies should allocate a large portion of their resources to human capital. This is owing to the fact that having a workforce that is highly educated, productive, resourceful, accountable, and well-trained is essential for a country to be able to adapt to the disequilibrium generated by importing technology from industrialized countries. This hasn't been adequately handled in the majority of African nations, which still lack access to foreign technologies and have inadequate plans for developing their human capital. Furthermore, the majority of African nations lack strong human capital development as a result of their failure to devote a sizable amount of their yearly budget to the advancement of health and education, which is reflected in human capital formation. Low productivity and high levels of income inequality are the results of under-investment in human capital. The adage "the rich get richer and the poor get poorer" still holds true in the majority of emerging countries (IMF, 2016). A wide range of theoretical and empirical investigations, as well as discussions, have become necessary in response to the increasingly alarming issue of the weak economic performance and growth of African economies. Although research has demonstrated both theoretically and empirically that the development of human capital is a critical factor in sustainable economic growth and development (Diaconu

and Popescu, 2016), human capital has not been adequately utilized to address the economic issues facing the majority of African nations. Over time, human capital has been used, mainly in developed nations, to address macroeconomic concerns and reduce levels of income inequality; however, this hasn't been the case in African countries, though, according to a study conducted on developed and developing nations by the World Bank in 2000 and Eggoh, Houeninvo, and Sossou in 2015. The study also found that nations like China, which have governments dedicated to developing their human capital, have improved their economic growth and reduced income inequality.

Education as one of the most essential tools of human capital development which improves human skills and thinking capacity for the production of goods and services. The wage that a laborer receives is mostly determined by his productivity; hence, enhanced production of goods and services will enable him to receive a higher salary which therefore improves his standard of living. Among other things, better health care, clean water, and food will be available to people with higher incomes. Some of the things that people consider important in a fulfilling life can be greatly enhanced by having a higher salary. The efficiency and pay of workers will rise in tandem with higher levels of education (Eggoh, et al (2015) and Akinsokeji & Akinlo (2019). Moreover, a large number of third-world countries, like those in Africa, possess a wealth of natural resources, which is considered a factor endowment. Despite this, these nations continue to suffer from poverty and income disparity due to a lack of trained labor to effectively utilize these resources. Human resources that are both efficient and effective will yield competent and inventive workers who can improve government and transform a country's economy. . Inability to develop human capital is a major contributing factor to low economic growth in some African countries (Fadile and Adeyinka, 2019; Odonkor, 2019). Both developed and developing countries have conducted studies on the relationship between the human capital development and economic growth. These studies include those by Suraya and Zalehu (2014), Jordan (2017), Fashina et el.(2018), and a few more. Moreover, there is a significant lot of controversy as a result of these research findings. The summation of Ampano and Rafael (2014) and Suruya and Zaleha (2014) revealed that although, enhancing the development of human capital in African countries will boost economic growth, it will also exarcebates wealth inequality. On the other hand, Jordan (2017) thought that increasing the development of human capital enhances macroeconomic performance and reduces income inequality. Many of these studies are based on particular countries and were conducted in developed economies.

How the remarkable economic growth of African nations in the recent time did not translate into a decline in the prevalence of poverty and wealth disparity is another unsettling mystery. More specifically, the World Bank (2017) reports that between 2006 and 2016, Africa's GDP grew by 3.1%, or an average of 2.1%, but at the same time, the region's rates of poverty and income inequality rose. The low human capital investment made by the majority of African nations, as evidenced by the human development index (HDI), may have been a major contributing factor to this. For instance, in 2015, the Central African Republic had an index of 0.352, South Africa had 0.664, Nigeria 0.527, the United States had 0.909, and the United Kingdom had 0.909(UNDP, 2016). In order to determine whether the high growth rate conundrum can be explained in the context of insufficient investment in human capital, this study attempts to provide some quantitative evidence. This study is unique due to the fact that, firstly, it looks at investment in human capital as a means of explaining the non-inclusive growth paradox in Africa. Secondly, the study included six variables, encompassed twenty countries, and spanned 37 years—all of which are sufficient to meet the goals of this study. This study is hereby examining the short and long-term relationship between human capital development and economic growth in African nations.

## EMPIRICAL LITERATURE

The following is the summary of some research works that have been carried out on the relationship between economic growth and human capital in both developed and developing countries: Jude, Hilaire, and Gilles-Armand (2015) examined the relationship between economic growth and the accumulation of human capital from 1996 to 2010 using data processing, dynamic panel and classic cross-section methodology, and regression analysis. Furthermore, their research indicates the mutual advantages of funding education and health. The study also revealed that efficiency in government in public investment in health and education should be improved in anticipation of a possible effect of human capital on the economic growth of African countries. Mohammed and Popoola (2016) studied the factors influencing human capital between 2000 and

2013 in their literary contribution. To process the data, Powell co-integration is employed. The long-run stable equilibrium relationship between human capital development and its drivers is demonstrated by the co-integration test. Over an extended period, every element significantly influences the development of human capital. Therefore, the research recommended that the government boost education and healthcare investment in order to assist human capital development.

Additionally, Ngepah (2015) studied the human capital and economic growth relationship with emphasis on the welfare and living condition of some African countries. Panel data employed with much emphasis on human capital economic growth variables. Using secondary and primary school graduation rates as well as enrollment ratios as part of the variables as proxy for education. The study made use of regression analysis to evaluate the data revealed a favorable relationship between investment and human capital. The report recommended that in order to lessen income inequality, the government concentrate on funding the development of human capital, especially in California where the bar for doing so has dropped.

Msweli (2015) looked into how human capital was developing in Botswana and South Africa. Regression analysis was used to process secondary data that were obtained from the two nations. The study examines the facets of human capital development responsible for the variations in the two countries' human capital index scores. The human capital index's four pillars are workforce employment, education, health and wellness, and enabling environment, which were used to compare and contrast Botswana and South Africa. According to his theory, education includes both educational accomplishment and access to high-quality education. A population's talent, skills, and experience are measured by workforce employment; their physical and mental well-being from childhood to adulthood is measured by health and wellness; and their legal framework, collaboration, and infrastructure (including internet and mobile users and the standard of domestic transportation) are measured by the enabling environment. Even though Botswana has a better index score than South Africa, the results indicate that both countries have negative scores. The brain drain of the skilled labour has increased the insufficiency of capable hands in Africa countries, the study therefore commended great reduction in skilled labour exodus from Africa nations.

Lawanson (2015) concentrated on the role that health-related and educational components of human capital played in the economic development of the West African Region between 1980 and 2013, using secondary data gathered from 16 countries of the region using panel linear regression analysis to analyze. The study placed a strong emphasis on health and education trends and how they contributed to the region's economic growth. The findings show that both the health and education components of human capital play a significant role in the region's economic growth, with health having a slightly stronger impact than education. The outcome further confirmed the significance of three health indicators in determining growth: life expectancy, newborn mortality, and under-five mortality rates. Consequently, it was suggested that legislators look into new funding sources and legislative measures to encourage and enhance population access to health and education.

Ogunleye et al (2017) conducted research on the relationship between Nigeria's economic growth and the advancement of human capital in collaboration with other authors. The study concluded by advising policymakers and the government to allocate more funding, especially for the areas of health care and education, in order to train employees and develop the human capital required for high productivity and Nigeria's economic growth.

Extending their research on the states of ECOWAS members between 1980 and 2016 years, Fadile and Olive-Bank (2019) provide evidence in favor of multiple authors on the significance of human capital development on economic growth. Ordinary least square was utilized in the study's data analysis along with secondary data. The information shows that there is a substantial and positive correlation between GDP and government spending on health and education, as well as school attendance in ECOWAS member nations. The report recommended that governments of ECOWAS member states implement suitable policies to alter the education sector in order to raise living standards and make education accessible and inexpensive for everyone, regardless of background in terms of culture or religion. Odonkor (2017) investigated Ghana's human capital-growth relationship. To estimate the model and the data, ordinary least squares regression (OLS) is used.

According to his findings, life expectancy and the labor force have a positive association with GDP, whereas capital and ongoing health and education expenditures have a negative link.

Ihugba, Ukwunna, and Obiukwu's (2019) study looks at how much the Nigerian government spent on education between 1970 and 2017 and how that affected the number of students enrolled in primary schools. To find the ways in which the variables interacted, co-integration and the Bounds Testing (ARDL) technique were employed with secondary data. The findings indicate that there is little correlation between government spending on education and the number of students enrolled in primary schools. Additionally, there is a positive correlation between population growth and primary school enrollment in the short term, but a negative correlation develops with time. Therefore, the study recommended policies targeted at increasing annual budgets and remittances with a high degree of transparency in order to strengthen the education sector and primary school education—the foundational level of learning.

The study conducted by Akinola and Bokana (2017) examined the correlation between human capital, enrollment in higher education, and economic growth in sub-Saharan African nations from 1980 to 2013. For the study, twenty-two nations from the four economic blocks were selected. Panel data was utilized, and OLS was applied to examine their discovery. The outcome demonstrated that, out of the four blocks, SADC nations do best. The study also found that, across all study blocks, there is virtually no correlation between the enrollment rate in higher education in SSA and economic growth. The report consequently suggested that, in order to ensure sustainable economic growth through the contribution and coordination of home-based human capital, all governments in the Blocs should implement a specific high priority strategy to expand higher education budgets and financing. In their own efforts to advance Nigeria's human capital development.

Sule et al (2020) investigated the effect of primary, secondary, and higher education enrolment on human capital in Nigeria using OLS and descriptive analysis. The study set out to determine the relationship between government spending on education and educational enrollment as well as the relationship between human capital development and enrolment in Nigerian schools. The findings indicate that while enrollment in secondary and post secondary institutions in Nigeria has a positive and significant impact on the country's human capital development, enrollment in elementary school has a positive but small impact on that same development. The study also discovered that enrolment in Nigeria's educational system is positively and significantly impacted by government investment on education. To close the skills gap and boost labor force availability, governments should form public-private partnerships to make significant expenditures in the education sector.

## METHODOLOGY

Lucas Endogenous Growth Model: Uzawa's endogenous growth model (1961) was merely modified by Lucas (1993). Uzawa provided an explanation of the growth model that equates long-term economic growth to the development of human capital. Lucas agreed that the manufacturing process depended on education investments since they generate human capital. Lucas did, however, make a distinction between human capital's internal and exterior consequences. He suggests that training has an internal effect of making a worker more productive; for the external effect, he links it to a scenario in which a worker benefits his employer as well as contributing to the economy's growth in capital and labor productivity. Finally, Lucas claimed that investments in human capital, as opposed to physical capital, have spillover effects that increase the degree of technology. For firm  $i$ , the output based on Lucas position will take the form

$$Y_i = A (k_i) \cdot (H_i) \cdot H^e$$

Where  $A$  = technical coefficient

$K_i$  = physical input

$H_i$  = input of human capital

$H$  = average level of human capital in the economy

$e$  = degree of external effects from human capital to each firm’s productivity.

The model assume constant return to scale.

### Model Specification

Investigating the long-term impact of human capital development on economic growth in Africa, this work uses one model for both the theoretical framework (the Augmented Solow-Human-Capital-Growth-Model) and the authors' positions in empirical research. Equation 3.1 was used.

$$RGDP_{it} = \kappa + \psi_1 ENROL_{it} + \psi_2 (INV / GDP)_{it} + \psi_3 GH_{it} + \psi_4 INF_{it} + \psi_5 GED_{it} + ECT_{it} + e_{it}$$

### Sources of Data

The data on macroeconomic variables was sourced from World Bank Data Base and IMF on line Data base. The five regions (Blocs) being considered in the study include North Africa (NADC), East Africa (EAC), Central Africa (CEMAC), Western Africa (ECOWAS) and Southern Africa (SADC).

## RESULTS AND DISCUSSION

To be more precise, panel ARDL estimation results are given in order to meet the goal. The results are shown in tables and figures, and then the findings are analyzed and discussed.

Table 1: Descriptive Statistics of Variables

Variables	Obs	Mean	Std. Dev.	Min	Max
RGDPgr	1365	3.155	5.593	-50.248	35.224
ENROL	1365	23.879	20.332	0	99.860
GFCF	1365	18.636	8.805	-2.424	60.156
GVED	1365	4.207	4.931	0	44.334
GVHT	1365	5.171	2.187	0	13.633
INFL	1365	46.603	672.897	-35.837	23773.13

Note: RGDPgr (in %); ENROL (% of gross); GVHT (% of GDP); GVED: (% of GDP); GFCF (% of GDP); INFL (%)

Source: Author’s Computation (2023)

Table 1 shows the variables that were used, as well as their mean, standard deviation, minimum, and maximum values. This is illustrated in Table 1 above. Over a 39-year period, the average real gross domestic product growth rate in twenty (20) African countries was 3.155%. The average gross fixed capital formation was 18.636%, the average inflation rate was 46.603, and the average government spending on health, education, and other sectors was 4.207% and 5.171%, respectively. Furthermore, Table 1 showed the 20 tested African countries' real gross domestic product growth rate across the study period, with minimum and maximum values of -50.248 and 35.224, respectively. The stated enrollment minimum and maximum for the institution were 0 and 99.861, respectively. Over the course of the 39-year study, the maximum value of gross fixed capital formation across 20 selected African countries was 60.156%, while the minimum value was -2.424%. For government spending on health, the minimum and maximum values were 0 and 13.334%, and for government spending on education, they were 0% and 44.334%. Finally, Table 1 showed the lowest and

maximum values of the inflation rate for the 39-year study period for the 20 African countries that were chosen, which were -35.837% and 23773.13%, respectively.

Correlation Analysis

Table 2: Correlation Statistics

	RGDPgr	ENROL	GFCF	GTED	GVHT	INFL
RGDPgr	1.000					
ENROL	0.007	1.000				
GFCF	0.170	0.165	1.000			
GVED	-0.084	0.234	0.000	1.000		
GVHT	0.077	0.408	0.071	0.254	1.000	
INFL	-0.057	-0.058	-0.039	-0.024	-0.044	1.000

Source: Author’s Computation (2023)

The amplitude and direction of the relationship between each pair of variables in the model are shown in Table 2. The findings showed that there is a negative relationship between real gross domestic product growth rate and variables like government spending on education and inflation, with reported correlation coefficients of -0.084 and -0.0570, and a positive relationship between real gross domestic product growth rate and variables like school enrolment, gross fixed capital formation, and government expenditure on health, with correlation coefficients of 0.007, 0.171, and 0.077, respectively. Table 2 displays the direction and magnitude of the association between each pair of variables in the model. The results demonstrated a positive relationship between real gross domestic product growth rate and variables like school enrolment, gross fixed capital formation, and government expenditure on health, with correlation coefficients of 0.007, 0.171, and 0.077, respectively, and a negative relationship between real gross domestic product growth rate and variables like government spending on education and inflation, with reported correlation coefficients of -0.084 and -0.0570.

Table 3: Panel Unit Root Test Result

Variables	TEST AT LEVEL			TEST AT FIRST DIFFERENCE			REMARK
	LLC	IPS	BT	LLC	IPS	BT	
RGDPgr	-10.531*	15.009*	-4.810*	-28.321*	-34.222*	-20.352*	I(0)
ENRL	1.082	3.101	3.883	-11.116*	-10.579*	-8.739*	I(1)
GFCF	-4.317*	-2.949*	-1.411	-17.097*	-20.716*	-17.344*	I(0)
GVED	-0.159	0.415	-0.816	-15.765*	-16.652*	-18.316*	I(1)
GVHT	-1.709	-0.548	-2.157*	-16.160*	-17.465*	-19.899*	I(1)
INFL	-8.384*	-8.456*	-6.783*	-22.147*	-27.998*	-25.934*	I(0)

V (\*) denotes unit root rejection hypothesis at a significance level of 5%.

Source: Author’s Computation, (2023)

Table 3 displays the findings of the study's panel unit root tests for the Im-Pesaran-Shin (IPS), Breitung test (BT), and Levin-Lin-Chu (LLC). All panel test statistics corroborate the stationary character of the real GDP growth rate, gross fixed capital formation, and inflation rate, with the exception of the divergence seen in the Breitung test unit root test for gross fixed capital formation. Furthermore, as indicated by Table 3's results, government spending on health and education as well as school enrollment became non-stationary yet integrated of Order 1. That is to say, the results showed that the real gross fixed capital creation, inflation, and growth rate of the GDP are integrated of order zero, or  $I(0)$ , meaning that these variables lose the innovative shock that was delivered to them. Government spending on health and education, together with school enrollment, are integrated of order one, or  $I(1)$ , indicating that innovation shock is only momentarily retained by these variables. As a result, the variables employed in the research are integrated between orders 0 and 1.

The synopsis of the research's conclusions about the long-term influence of human capital on economic growth in Africa. The panel ARDL estimation result is displayed for each block and for the total sample of African countries used in the study. The results are displayed in tables and are subsequently explained. Based on the Hausman 1978 test results, Table 10 suggests using the pooled mean group estimation.

Table 4: Hausman 1978 Test

Null hypothesis	Test statistic (Chi <sup>2</sup> )	Probability
Difference in coefficients not systematic	3.84	0.573

Source: Author's Computation (2023)

The null hypothesis, according to which there is no systematic difference in the coefficient, was tested by comparing the pooled mean group estimate result with the mean group estimation result. The pooled mean group is valid for this study because, as the table reports, the chi-square statistics stood at 3.84 with a probability value of 0.573, indicating that there is insufficient evidence to reject the null hypothesis that the difference in the coefficient of the mean group and pooled mean group estimation is not systematic. As seen in the tables below, the pooled mean group option serves as the foundation for the panel ARDL estimation.

### Combined Estimation

Table 5: Panel ARDL Estimation Result

Dep Var: D (RGDPgr)

LONG RUN ESTIMATE				
Variable	Coefficient	Standard error	Z-test	Probability
ENRL	0.011	0.012	0.91	0.364
GVED	-0.211	0.069	-3.02	0.003
GVHT	0.034	0.109	0.32	0.752
GFCF	0.039	0.019	2.00	0.046
INFL	0.001	0.001	1.63	0.102
SHORT RUN ESTIMATE				
Variable	Coefficient	Standard error	Z-test	Probability

ECT	-0.883	0.114	-7.72	0.000
C	1.959	0.237	8.25	0.000
D(ENRL)	-0.409	0.636	-0.64	0.520
D(GVED)	-3.536	3.614	-0.98	0.328
D(GVHT)	26.741	27.229	0.98	0.326
D(GFCF)	0.046	0.270	0.17	0.866
D(INFL)	-0.019	0.019	-0.97	0.334

Table 5 displays the short- and long-term coefficients, z-test, and probability estimation for each of the sampled African countries regarding the influence of human capital characteristics on economic growth. Among these variables are school enrollment, inflation, gross fixed capital expenditure, and spending on educators and healthcare. The long-term coefficients and probability for these variables are, respectively, 0.011 and 0.364 ( $p > 0.05$ ). With corresponding probability and coefficient values of -0.211 and 0.003 ( $p > 0.05$ ), the results showed that government spending on education had a significant and negative effect on the real GDP growth rate.

With reported coefficient and probability values of 0.0343904 and 0.752 ( $p > 0.05$ ), the performed estimation demonstrates that government expenditure on health has a positive but minor impact on the real GDP growth rate. Table 4.5 demonstrated that both inflation and gross fixed capital creation had a positive effect on GDP, with reported coefficients and probability values for the inflation rate and gross fixed capital formation of 0.001 and 0.102 ( $p > 0.05$ ) and 0.0399 and 0.046 ( $p < 0.05$ ), respectively. Nonetheless, there is no statistically significant effect of inflation.

On the other hand, real GDP growth rate is negatively and insignificantly impacted by government spending on education, inflation, and school enrollment (reported coefficients of -0.409 ( $p > 0.05$ ), -3.536 ( $p > 0.05$ ), and -0.0193 ( $p > 0.05$ ), respectively). Government spending on health and gross fixed capital creation, with coefficients of 26.741 ( $p > 0.05$ ) and 0.0456 ( $p > 0.05$ ), respectively, had a positive but negligible impact on real GDP growth rate, according to the short run estimation for the sample countries.

**Bloc Estimation**

Table 6: Panel ARDL Estimation Result

Dep Var: D(RGDPgr)

LONG RUN ESTIMATE					
	NADC	EAC	CEMAC	ECOWAS	SADC
Variable	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient
ENRL	-.022	.037	0.014	.034	.020
GVED	-.260	-.372	-0.590	-.079	-.166
GVHT	-.121	.001	0.511	.329	.087
GFCF	.062	.012	0.149	.029	.024



INFL	-.001	.0003	0.003	.028	-.083
SHORT RUN ESTIMATE					
	NADC	EAC	CEMAC	ECOWAS	SADC
Variable	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient
ECT	-.881*	-.847*	-.651*	-.956*	-.903*
C	3.583*	3.923*	7.328*	6.995*	11.751*
D(ENRL)	-.042	.157	-.106	.482	-.065
D(GEVD)	1.241	.173	-.068	-.209	.119
D(GVHT)	-.755	-.996	-.310	-.231	-.062
D(GFCF)	-.058	-.039	-.323*	.259*	-.168
D(INFL)	.064	-.026	.043	-.044	.089*

Source: Author’s Computation (2023)

Table 6 presents the findings that illustrate how government spending on education and health, as well as inflation and gross fixed capital expenditure as control factors, affect the real gross domestic product growth rate in each region. The z-test, the long- and short-term coefficients, and the probability estimation of these factors were also included in the results. With coefficients of 0.037, 0.014, 0.034, and 0.020 in East Africa, Central Africa, West Africa, and Southern Africa, respectively, the long-term results showed that school enrollment has a positive insignificant effect; however, with a coefficient of -0.022, it has a negative insignificant effect in North Africa (NADC). This demonstrated that, in the majority of the blocked estimates, the effect of school enrollment on the real gross domestic product growth rate is comparable to the combined result. With coefficients of -0.026, -0.372, -0.591, -0.079, and -0.167, respectively, the results also showed that the long-term impact of government spending on education on the real gross domestic product growth rate is negative and insignificant for North Africa (NADC), East Africa (EAC), Central Africa (CEMAC), West Africa (ECOWAS), and Southern Africa (SADC). The findings also demonstrated that, for North Africa (NADC), East Africa (EAC), Central Africa (CEMAC), West Africa (ECOWAS), and Southern Africa (SADC), the long-term effects of government spending on education on the real gross domestic product growth rate are negative and negligible. This implies that, even though the

This suggests that, while the combined estimates varied in significance, most Bloc estimates pointed to a negative impact of government spending on education. On the other hand, government health spending had a positive insignificant influence (coefficients of 0.001, 0.511, 0.329, and 0.088) on the real gross domestic product growth rate in EAC, CEMAC, ECOWAS, and SADC, but a negative negligible effect (coefficient of -0.122 in NADC). This demonstrated that, in terms of both direction and significance, the majority of African Blocs represent the same outcome as the combined estimation. The real gross domestic product growth rate is positively impacted by gross fixed capital creation, but insignificantly—with coefficients of -0.062, 0.012, 0.149, 0.029, and 0.025. This showed that while the overall results of the majority of African blocs are similar in direction, they vary in significance. This demonstrated that, in terms of both direction and significance, the majority of African Blocs represent the same outcome as the combined estimation. The results also indicated that, while the inflation rate in NADC has an insignificant negative long-run effect on real gross domestic product growth rate (coefficient of 0.001), it has a positive, insignificant long-run effect on growth rates in the real gross domestic product in the EAC, CEMAC, ECOWAS, and SADC (coefficients of 0.0003, 0.003, 0.029, and 0.084, respectively). This suggests that, overall, most African blocs have results that are similar to each other in terms of significance, but in different directions. has a positive, negligible long-term impact on growth

rates in the real gross domestic product in the EAC, CEMAC, ECOWAS, and SADC (coefficients of 0.0003, 0.003, 0.029, and 0.084, respectively), but a negligible long-term negative effect on the real gross domestic product growth rate (coefficient of 0.001). This implies that the majority of African blocs have results that, while varying in direction, are generally comparable to one another in terms of significance consistent with the combined estimates, the short run estimation result likewise showed a negative and negligible influence of school enrollment on real GDP growth rate in the NADC, CEMAC, and SADC. With coefficients of 0.157 and 0.482, respectively, it has a positive but negligible impact on the real GDP growth rate in the EAC and ECOWAS, indicating that the majority of African blocs have comparable outcomes with

combined estimation. In the short term, government spending on education has a negligible positive impact on the real GDP growth rate in the NADC, EAC, and SADC (coefficients of 1.241, 0.172, and 0.119, respectively), but a negligible negative impact in the ECOWAS and CEMAC (coefficients of -0.068 and -0.209, respectively). This demonstrated that, when it comes to the impact of government spending on education, the majority of African blocs have similar outcomes.

With coefficients of -0.755, -0.996, -0.310, -0.231, and -0.062, respectively, Table 6 also demonstrated that government spending on health has a short-term negative, insignificant impact on the real GDP growth rate in the NADC, SADC, EAC, CEMAC, and ECOWAS. This indicates that the majority of the estimates for the African Blocs differ from the combined estimates. With a coefficient of 0.259, gross fixed capital expenditure likewise has a positive, significant short-term impact on the real GDP growth rate in the ECOWAS. However, the NADC, EAC, CEMAC, and SADC experience negative effects, with corresponding coefficients of -0.058, -0.039, -0.323, and -0.168. Only the effect in CEMAC is noteworthy. This demonstrated that while the direction of the majority of the African Blocs' results differed from the combined results, their importance in relation to the impact of gross fixed capital formation on real GDP growth rate was identical. The majority of African blocs' estimates differ from combined estimates when it comes to the impact of inflation on real GDP growth rate., according to published ECT(-1). With a coefficient of 0.400 ( $p=0.339$ ), 0.539 ( $p=0.772$ ), and 0.006 ( $p=0.835$ ), respectively, it demonstrated that government spending on health and inflation., On the other hand, inflation affects the real GDP growth rate in East Africa and ECOWAS negatively in the near run, but not in North Africa, Central Africa, or SADC. Additionally, the effect is only noteworthy in SADC. Nearly all of the NADC, EAC, CEMAC, ECOWAS, and SADC regions—88.12 percent, 84.7 percent, 65.08 percent, 95.5 percent, and 90.3 percent—had a positive but insignificant influence on the gini coefficient. Furthermore, the outcomes showed that government investment on education and enrollment in schools had a short term negative, and substantial impact on the gini coefficient, with coefficient estimates of -0.027 ( $p=0.046$ ) and -0.009 ( $p=0.959$ ).

## DISCUSSION OF FINDINGS

The following were found from the analysis and interpretation done for the four goals of the study on economic growth, income inequality, and human capital in Africa. School enrollment has a short-term negative insignificant effect on economic growth but a long-term positive insignificant effect with a coefficient of -0.4090 and 0.0113, respectively, according to an analysis of the long-term effects of human capital development variables on economic growth. This suggests that a 1% increase in school enrollment will, in the near term, result in a 0.02% decrease in economic growth, but that the same amount of enrollment growth may, in the long run, result in a 0.011% rise in economic growth for African nations. In order to meet short-term educational costs, resources intended for productive endeavors may be diverted into student enrollment. This lowers available funds for maintaining and growing the productive capacity, which slows down economic growth. But over time, education strengthened entrepreneurship, creativity, and innovation productivity in addition to technological developments that enhanced the labor pool and spurred economic expansion. Because the results of this study relate to the positive effect of primary and tertiary school enrolment on the level of economic growth, which is similar to the findings of Kakar, Khilji and Khan (2011) and Afzal, Farooq, Ahmad, Begun, and Quddus (2010), the long-term result is somewhat similar to the findings of Elena (2011).

Government expenditure on education should enable both the privileged and the access educational institutions, thereby providing opportunities for the creation of new ideas, technological advancements, diverse skills, and the efficient coordination of other resources. Conversely, with coefficients of -3.5361 and -0.2110,

less fortunate respectively, government investment on education has a negative influence on economic growth in African nations both in the short and long run. This means that a 1% increase in government education spending will result in a 3.53 percent and 0.2 percent drop in African nations' economic development in the short and long run, respectively. It also indicated that the impact is greater in the short term than the long run.

For African nations, this is not the case, though. The majority of these nations experienced brain drain despite having invested much in the development of human capital due to a dearth of employment prospects. Many people have been unable to continue their education because of corruption and mismanagement in the educational system, and some have not even completed elementary school. The majority of these countries also lack innovation and technological development that can spur economic growth. The long-term effect study's findings are consistent with Elena's (2014) research of the relationship between human capital and economic growth in Romania and other EU nations. The results of this study, however, conflict with Adedokun's (2011) analysis of the long-term detrimental effects of government spending on education on human capital development and economic growth in Nigeria. This discrepancy may be due to the heterogeneity of the African nations included in the current study. Government spending on health has a positive but negligible impact on the long- and short-term economic growth of African nations, with coefficients of approximately 26.741 and 0.034, respectively. This showed that an increase in government spending on health would result in increases of roughly 26.7% and 0.03%, respectively, if all other variables remained the same. Government spending on health can improve people's access to better health opportunities and thus boost the country's economic performance. Health improves cognitive growth and learning capacity, which helps the economy recoup its investment in education. Since good health enables human capital to perform mental and physical productive activities efficiently and effectively, it promotes the accumulation of human capital, which in turn promotes the employment of experienced human capital and facilitates knowledge transfer. Additionally, it ensures that knowledge transfer in the field is enhanced, which in turn promotes more productivity and, implicitly, economic growth. These results are comparable to those of Adedokun (2011), who studied the relationship between human capital and economic growth in Nigeria. However, his findings revealed some differences in terms of significance, which may have resulted from the use of different measures of economic growth and the combination of heterogeneous countries.

## RECOMMENDATIONS

In order to maximize the effective use of public resources, the educational system needs to be improved through excellent governance, accountability, and openness. Policymakers ought to work to develop measures that would restrain and safeguard the plight of intellectual capital in other nations. To increase people mental and physical activity levels and their ability to contribute to economic growth, the government should invest more in improving health facilities and making them more accessible to the public, particularly in remote places. This will also increase opportunities for people to earn additional revenue. To boost economic growth and income distribution, the government should start using various forms of sensitization at the elementary school level to discourage student dropout rates. This will increase school enrollment.

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