

Socio-economic governance and economic growth in Nigeria

Economic
growth in
Nigeria

187

Olalekan Charles Okunola

*Department of Defence and Security Studies,
Institute for Peace and Conflict Resolution, Abuja, Nigeria*

Imran Usman Sani

Institute for Peace and Conflict Resolution, Abuja, Nigeria, and

Olumide Abiodun Ayetigbo

*Department of Business Administration, National Open University of Nigeria,
Abuja, Nigeria*

Received 23 March 2023

Revised 19 May 2023

2 July 2023

6 July 2023

Accepted 7 July 2023

Abstract

Purpose – The study examines the impact of socio-economic governance on economic growth in Nigeria. It measures socio-economic governance from the perspective of fiscal policy, using indicators such as investment in education, research and development (R&D) and health.

Design/methodology/approach – This study employs the Autoregressive Distributive Lag (ARDL) Bound Testing method to achieve its objective.

Findings – The study finds that socio-economic policies aimed at increasing investment in education are crucial for Nigeria's long-term economic growth. Additionally, investment in R&D positively impacts economic growth. However, the study reveals that investment in health negatively affects economic growth in Nigeria in the long run. This suggests that if a country overinvests in health, it may divert resources from other vital sectors such as education, infrastructure and R&D, which can hinder overall economic growth. The short-run parameter is, however, not statistically significant in this study.

Originality/value – The study's originality lies in its exploration of the relationship between socio-economic governance and economic growth in Nigeria, specifically from a fiscal policy perspective. It highlights the importance of investing in education and R&D for long-term economic growth. Additionally, the finding that overinvestment in health may have a negative impact on long-term economic growth provides valuable insight for policymakers in Nigeria and other developing countries. Overall, this study's findings can be beneficial for policymakers and researchers interested in the intersection between socio-economic governance and economic growth in developing countries.

Keywords Socio-economic governance, Nigeria, Economic growth, ARDL bound testing

Paper type Research paper

1. Introduction

The indicators of combined economic and social status in Africa tend to be comparatively low when compared to other regions of the world. For instance, in 2010, Sub-Saharan Africa had approximately 416 million people living in extreme poverty, a number that increased to over

© Olalekan Charles Okunola, Imran Usman Sani and Olumide Abiodun Ayetigbo. Published in *Journal of Business and Socio-economic Development*. Published by Emerald Publishing Limited. This article is published under the Creative Commons Attribution (CC BY 4.0) licence. Anyone may reproduce, distribute, translate and create derivative works of this article (for both commercial and non-commercial purposes), subject to full attribution to the original publication and authors. The full terms of this licence may be seen at <http://creativecommons.org/licences/by/4.0/legalcode>

The authors hereby acknowledge the contributions of the prospective reviewers of this work.

Availability of data and materials: The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Competing interests: The authors declare that they have no competing interests.

Authors' contributions: The authors contributed equally to the writing of this research paper.



Journal of Business and Socio-
economic Development
Vol. 5 No. 2, 2025
pp. 187-203
Emerald Publishing Limited
e-ISSN: 2635-1692
p-ISSN: 2635-1374
DOI 10.1108/JBSED-03-2023-0019

457 million people in 2021 ([Development Initiatives, 2021](#)). Additionally, there are variations in human development levels across countries worldwide, but many African governments face challenges in achieving high human development. For instance, in 2021, countries like Switzerland and Norway were ranked 1st and 2nd in human development, with scores of 0.962 and 0.961, respectively, while countries in Africa such as South Sudan and Chad were ranked 191th and 190th, respectively, with scores of 0.385 and 0.394. Socio-economic governance refers to the process that governs societies, where no single actor can claim absolute dominance ([Orosz and Szijártó, 2021](#)). One way to improve socio-economic governance is through implementing policies that reduce economic and social inequality, with a focus on investing in human capital. The literature has extensively debated the relationship between socio-economic governance and economic growth, with differing viewpoints on the impact of socio-economic governance (proxied by human development) on economic growth, and vice versa. While economic growth affects socio-economic governance, this study specifically examines the impact of socio-economic governance on economic growth in Nigeria, with a focus on policies and efforts to improve human development.

Socio-economic governance policies encompass various measures and interventions used by governments, institutions and organizations to manage and regulate economic activities and enhance social well-being. These policies include fiscal, monetary, social, environmental, international trade, labor and industrial measures. This study specifically focuses on the fiscal policy aspect of socio-economic governance, particularly public expenditures/investments in education, health and research and development (R&D). In this study, the fiscal aspect is measured by investment in education, health, and R&D.

Nigeria, like many other prosperous economies, has struggled to fully realize its development potential in terms of sustainable human capital development or people-oriented development, like many other prosperous economies in the world that have adopted a similar strategy to boost their economic growth. As a result, a significant portion of Nigeria's population, estimated at 182.2 million by the [World Bank \(2016\)](#), still faces low literacy levels and limited access to education and healthcare. Data from the Ministry of Education revealed that as of September 2021, 38% of the estimated 200 million population, representing over 76 million adults, are non-literates ([Onyedinefu, 2022](#)). Despite having a moderately high per capita income, Nigeria's educational achievements fell below expectations. Nigeria was ranked 161 out of 189 countries in the UN's Human Development Index, placing it well below its African counterparts such as the Democratic Republic of the Congo and Ethiopia, and significantly lower than the average for Sub-Saharan Africa ([United Nations, 2022](#)).

Schultz (1993) defines human capital as a tool for enhancing competitive advantage, involving processes such as training, knowledge acquisition (education), initiatives and others geared toward skills acquisition. Similarly, endogenous growth theories primarily emphasize the role of human capital (e.g. [Mankiw *et al.*, 1992](#); [Lucas, 1988](#)). Furthermore, theoretical contributions have highlighted two main mechanisms through which education affects economic growth ([Hanushek and Woessmann, 2008](#)), as an input to the production process ([Lucas, 1988](#)) and as a primary source of productivity growth ([Chaudhry and Rahman, 2009](#)). Some studies have also demonstrated that education and investment in human capital development, including education and health, positively influence economic growth ([Adamu, 2002](#); [Chete and Adeoye, 2001](#); [Mankiw *et al.*, 1992](#)). On the other hand, [Ndiyo \(2003\)](#) and [Adawo \(2011\)](#) have shown a negative relationship, while [Ogujiuba \(2013\)](#) claims that there is no significant link between human capital development and economic growth. Given the divergent views on the impact of investment in education on economic growth, it would be instructive to examine this relationship in Nigeria.

Similarly, there is a clear relationship between healthcare investment and economic growth ([NHS Confederation, 2022](#); [Ramdorai *et al.*, 2020](#); [Piabuo and Tieguhong, 2017](#); [WHO, 2013](#)). Such a relationship has been investigated in both developed and developing countries

(Eryigit *et al.*, 2012; Piabuo and Tieguhong, 2017; Elmi and Sadeghi, 2012; Bakare and Olubokun, 2011; Wu *et al.*, 2021; Ozyilmaz *et al.*, 2022; Bloom *et al.*, 2018; Oni, 2014; Mandiefe and Chupezi, 2015; Eggoh *et al.*, 2015). Some of these studies have shown a positive relationship between health investment and economic growth (Oni, 2014; Bakare and Olubokun, 2011; Bloom *et al.*, 2004; Piabuo and Tieguhong, 2017) while others have demonstrated a negative impact (Eggoh *et al.*, 2015). However, there are also studies like (Wu *et al.*, 2021) that present conflicting results, showing both positive and negative relationships depending on the specific Asian country under investigation (Piabuo and Tieguhong, 2017). Given these divergent views on the relationships between investment in health and economic growth, it is important to investigate the nature of this relationship in Nigeria.

R&D investments are considered significant determinants for enhancing a country's development and competitiveness (Bor *et al.*, 2010). Countries that prioritize R&D expenditures have experienced significant progress in scientific and technological advancements. Several studies have investigated the relationship between R&D investments and economic growth (Türedi, 2016; dereli and Salğar, 2019; Ulger and Uçan, 2018; Yao *et al.*, 2021; Wang and Wu, 2015; Wakelin, 2001; Bayraktar *et al.*, 2022). While some studies suggest that investment in R&D does not significantly impact economic growth, others claim that investment in R&D promotes productivity growth (Wakelin, 2001). With the absence of a consensus on the relationship between investment in R&D and economic growth, studying this relationship in Nigeria will contribute to the extant literature on socio-economic governance and growth.

Since there is no consensus regarding the nexus between socio-economic governance, as measured by investment in education, health and R&D, and economic growth. Therefore, it is crucial to investigate the links between socio-economic governance, particularly from the perspective of fiscal policy, and economic growth in Nigeria. One of the significant gaps in the existing literature on socio-economic governance and growth lies in the inadequate measurement and conceptualization of these factors. This study aims to address these issues by shedding light on the impact of the fiscal aspect of socio-economic governance on economic growth, providing valuable insights for policymakers and governments on how to enhance economic growth through improved socio-economic governance. This study distinguishes itself from previous studies in the governance-growth literature by specifically focusing on the fiscal aspect of socio-economic governance and its influence on economic growth in Nigeria. In addition to the introductory section, Section 2 reviews relevant studies, while Section 3 presents the methods and materials employed in the study. Section 4 examines the trends observed in socio-economic governance measures. Section 5 presents and discusses the study's findings, while Section 6 provides the concluding remarks.

2. Literature review

Socio-economic governance policies encompass various measures and interventions used by governments, institutions and organizations to manage and regulate economic activities and social well-being. This study specifically focuses on the fiscal aspect of socio-economic governance, which is measured through investments in education, health and R&D. The importance of investment in human development as a measure of socio-economic governance is also highlighted in the study by Migata-Warchoł (2019).

Several studies, such as Chaudry and Rahman (2009), Orji *et al.* (2020), Keji (2021) and Kareem *et al.* (2020), have supported the notion that the growth of an economy is influenced by its investment in physical and human capital. Consequently, substantial investment in human capital is deemed necessary for a sustained economic development path (Ogujiuba, 2013). Scholars argue that higher levels of formal educational attainment lead to increased economic growth. Lucas (1988) suggests that the accumulation of human capital translates

into sustained economic growth, with education being the primary driving force behind knowledge accumulation. Romer (1989, 1990, 1994) demonstrates that human capital stimulates economic growth and drives innovation. Furthermore, the literature shows that education provides spillover effects, enhances entrepreneurs' ability to adapt to disequilibrium and boosts research productivity, as evidenced by studies conducted by Romer (1989) and Rostow (1960).

Empirical studies have investigated the relationship between investment in human capital development and economic growth (Mankiw *et al.*, 1992; Klenow and Rodríguez-Clare, 1997; Adamu, 2002; Chete and Adeoye, 2001; Mankiw *et al.*, 1992; Adawo, 2011; Ogujiuba, 2013; Olalekan, 2014; Obi and Obi, 2014; Ajadi and Adebakin, 2014; Oladeji, 2015; Borojo and Jiang, 2016; Adeyemi and Ogunsola, 2016; Attahir *et al.*, 2020). Many of these studies argue that investment in education and health positively influences economic growth (Mankiw *et al.*, 1992; Klenow and Rodríguez-Clare, 1997; Adamu, 2002; Chete and Adeoye, 2001; Mankiw *et al.*, 1992). On the other hand, Ndiyo (2003) and Adawo (2011) establish a negative relationship between investment in human capital development and economic growth, while Ogujiuba (2013) suggests that there is no significant link between the two.

In recent studies, Akwe and Hall (2023) find a significant negative effect of human capital development on economic growth in Nigeria, with a significant positive impact of corruption on gross domestic product (GDP) per capita. Adegboyega (2023) demonstrates the importance of inclusive economic growth for poverty reduction by increasing employment and improving opportunities for productive activities among people experiencing poverty. Abubakar (2023) reveals a negative relationship between globalization and economic growth in Sub-Saharan countries, including Nigeria, South Africa, Kenya and Ghana. Also, Aqib & Zaman (2023) emphasize the role of human capital, labor market changes, R&D spending and technology that helps people do their jobs in a country's developmental agenda.

Zaman (2023) also highlights the importance of promoting economic diversification and investing in social protection programs to reduce poverty and inequality. The study examines five dimensions of socioeconomics: economic, political, social, judicial and establishment, and geopolitical risks and challenges. Additionally, Yıldız *et al.* (2023) investigate the socio-economic development aspects of democratic governance in selected countries and find that crime rates are granger caused by economic growth, democratic governance, unemployment and urbanization. They suggest that effective governance can contribute to the reduction of crime. Jorgenson and Fraumeni (1992) discover that investment in human and nonhuman capital accounts for most of the growth in the US economy during the postwar period. Therefore, increasing investments in human and nonhuman capital is necessary to revive economic growth in the United States. They note that educational investment is essential for achieving rapid growth in the United States. Similar studies in Nigeria have also examined the relationship between investment in education and economic growth (Ifionu and Nteegah, 2013; Ajadi and Adebakin, 2014; Adegboyega, 2023; Abubakar, 2023). Ifionu and Nteegah (2013) find that government capital expenditure on social services (education and health) and recurrent government expenditure on education significantly impact economic growth.

Furthermore, the relationship between public expenditure on health (PEH) and economic growth has been investigated in both developed and developing countries (Baldacci *et al.*, 2004; Bloom *et al.*, 2004, 2018; Aurangzeb, 2003; Eryigit *et al.*, 2012; Piabuo and Tieguhong, 2017; Elmi and Sadeghi, 2012; Bakare and Olubokun, 2011; Wu *et al.*, 2021; Ozyilmaz *et al.*, 2022; Oni, 2014; Mandiefe and Chupezi, 2015; Eggoh *et al.*, 2015). Some of these studies indicate a positive relationship between health investment and economic growth (Oni, 2014; Bakare and Olubokun, 2011; Baldacci *et al.*, 2004; Bloom *et al.*, 2004; Aurangzeb, 2003; Piabuo and Tieguhong, 2017), while others demonstrate a negative impact (Eggoh *et al.*, 2015). However, studies like (Wu *et al.*, 2021) present mixed results, showing both positive and

negative relationships depending on the specific Asian country under investigation (Piabuo and Tieguhong, 2017). Therefore, there are divergent views in the literature regarding the relationships between investment in health and economic growth, necessitating further investigation.

Research and development investments are considered key determinants for the development and competitiveness of a country (Bor *et al.*, 2010). Countries that prioritize R&D expenditures are believed to make significant progress in scientific and technological terms. Several studies have examined the relationships between R&D investments and economic growth (Türedi, 2016; dereli and Salğar, 2019; Ulger and Uçan, 2018; Yao *et al.*, 2021; Wang and Wu, 2015; Wakelin, 2001; Bayraktar *et al.*, 2022). While some studies suggest that investment in R&D does not impact economic growth, others (Wakelin, 2001) argue that it promotes productivity growth. Given the lack of consensus on the relationship between investment in R&D and economic growth, studying the relationships between investment in R&D and economic growth, it is important to study the relationship in Nigeria, which will contribute to the existing literature on socio-economic governance and growth.

In the literature on socio-economic governance and growth, there is no consensus on the impact of socio-economic governance (measured by investment in education, health and R&D) on economic growth in Nigeria. Additionally, most studies have focused on socio-economic governance indicators such as human capital development, poverty, corruption, crime rates and the effectiveness of anti-graft agencies as means to enhance good governance and achieve accountability, aiming to foster equitable income distribution in a country. However, socio-economic governance measures such as investment in education, R&D and healthcare facilities, which have the potential to improve the quality of life for the poor and valuable individuals in Nigeria, have not been adequately addressed in the literature. Therefore, this study aims to fill this gap.

3. Method and materials

The study adopts the neoclassical growth model of Solow (1956) and (Swan, 1956) as the foundational theoretical framework linking economic growth and human capital development. According to the Solow–Swan model, the total output in an economy (Y_t) is determined by the product of the combination of capital (K_t) and labor (L_t), as expressed in equation (1):

$$Y_t = f(A, K_t, L_t) \quad (1)$$

Where,

Y_t = Total output at time t

A = Technological progress

K_t = Capital input at time t

L_t = Labor input at time t

The economic planner would be interested in determining the proportion of the total economy-wide output Y_t , which can be attributed to labor and capital. In his seminal paper, Solow (1956) demonstrates that after accounting for the contribution of total labor and capital to total output, the remaining portion is attributed to total factor productivity (TFP). Thus, the growth in an economy's total output is attributed to the growth in labor, capital and TFP, as outlined in Solow's growth accounting framework. TFP growth represents the effect of exogenous technological progress in this neoclassical growth model, which can also be reflected in increasing production efficiency.

Building upon the work of [Adeyemi and Ogunsola \(2016\)](#), [equation \(1\)](#) is augmented to include the effects of public expenditure on education (PEE), health and R&D, as shown in [equation \(2\)](#):

$$A = f(PEE_t, PEH_t, PER_t) \quad (2)$$

Where,

A = Technical Efficiency

PEE_t = Public Expenditure on education at time t

PEH_t = Public Expenditure on health at time t

PER_t = Public expenditure on R&D at time t

By substituting [equation \(2\)](#) into [equation \(1\)](#), an extended form is derived as [equation 3](#):

$$Y_t = f(PEE_t, PEH_t, PER_t, K_t, L_t, FDI_t) \quad (3)$$

[Solow's \(1956\)](#) model adopted in this study is an optimization model, which is suitable for the Nigerian context. The regression form of the model, stated in a linear structure, is presented as [equation \(4\)](#):

$$Y_t = b_0 + b_1PEE_t + b_2PEH_t + b_3PER_t + b_4K_t + b_5L_t + b_6FDI_t + U_t \quad (4)$$

To focus specifically on economic growth, [equation \(3\)](#) is decomposed by excluding capital (K_t) and labor force (L_t) and replacing output (Y_t) with a proxy of economic growth, that is, gross domestic production (GDP_t). This yields [equation \(5\)](#), expressed in logarithm form:

$$\ln GDP_t = b_0 + b_1 \ln PEE_t + b_2 \ln PEH_t + b_3 \ln PER_t + b_4 \ln K_t + b_5 \ln L_t + b_6 \ln FDI_t + U_t \quad (5)$$

Where:

ln = Logarithm

b_0 = Intercept

$b_1 - b_6$ = Slopes of the regression model to be estimated

U_t = Error term

The adoption of the double log-linear functional form in [equation \(5\)](#) ensures that the data are in the same unit, preventing potential econometric problem(s). This study employs the Autoregressive Distributed Lag (ARDL) bounds testing approach developed by [Pesaran et al. \(2001\)](#) to analyze the long- and short-run effects of socio-economic governance on economic growth in Nigeria. This approach allows for the examination of the long-term relationships between socio-economic governance and economic growth.

The ARDL bounds testing approach, based on the framework proposed by [Pesaran and Shin \(1998\)](#) and [Pesaran et al. \(2001\)](#), has been widely adopted in previous studies such as [Okunlola and Akinlo \(2021\)](#), [Akinlo and Okunlola \(2022\)](#), [Okunlola and Okafor \(2022\)](#), and [Okunlola \(2019\)](#). This approach addresses endogeneity issues by incorporating lagged values of both explained and explanatory variables in the model. By doing so, it takes into account potential feedback effects and resolves the problem of simultaneous causality that may arise during the analysis ([Okunlola and Akinlo, 2021](#); [Akinlo and Okunlola, 2022](#); [Okunlola and Okafor, 2022](#); [Okunlola, 2019](#)).

4. Socio-economic governance and economic growth in Nigeria

As stated at the beginning of this paper, socio-economic governance policies encompass various measures and interventions employed by governments, institutions and organizations to manage and regulate economic activities and social well-being. This study specifically focuses on government interventions through investments in education, health and R&D. Education serves as the foundation for development, being a critical component of a country's human capital. It improves the performance and efficiency of workers, enabling economies to transcend manual tasks or simple production processes (World Economic Forum, 2015), and move up the value chain. Therefore, investing in education has a positive impact on economic growth. Similarly, health plays a central role in economic growth and development; a healthy workforce translates to increased productivity, thus, higher income per person (World Health Organization, 2015).

This significance of education for productivity and growth has prompted countries and international organizations worldwide to advocate for increased investment in education. For instance in UNESCO (2016), the Education-2030-Framework for Action proposes two benchmarks as "crucial reference points": allocating at least 4–6% of GDP to education and/or allocating at least 15–20% of public expenditure to education. However, on average, countries globally spend only 4.7% of GDP on education and allocate 14.2% of public expenditure to education, with 35 countries spending less than 4% of GDP and allocating less than 15% of public expenditure to education.

According to Adetula *et al.* (2017), in 2015 and 2016, the Nigerian federal government allocated N392.4 billion and N369.6 billion to education, accounting for approximately 9.5 and 7.9% of the total budget, respectively. This demonstrates Nigeria's commitment to the educational sector, although it falls significantly behind its West African counterpart, Ghana, which allocated about 31% of its budget to education. However, Nigeria's allocation is still far below the 26% recommended by the United Nations Educational, Scientific and Cultural Organization (UNESCO) for developing countries. Throughout the study period, Nigeria's allocation to education never met UNESCO's recommendation, with the highest being 13.0% in 2008 (see Figure 1). Similarly, the growth rate of education spending was the highest in 2008, with a notable increase of approximately 55.5% compared to the previous year (see Figure 2). This surge in growth could be attributed to Nigeria experiencing economic growth during that period, driven by rising oil prices and increased revenue generation. The country's economic growth facilitated increased funding across various sectors, including education. On average, Nigeria allocated a mere 6.6% of its budget to education over the study period, significantly below the average UNESCO benchmark. These figures underscore Nigeria's need to strengthen its commitment to education and socio-economic governance.

Socio-economic governance in Nigeria has witnessed consistently low levels of investment in healthcare. For instance, the government's budgetary allocation to health has remained persistently low, averaging around 5%, falling significantly short of the international benchmark of 15% (NHA, 2016). Furthermore, government spending constitutes only approximately 29% of total health spending, while the private sector contributes as much as 70% (World Bank, 2023). This limited funding from the government has resulted in inadequate health infrastructure and limited access to quality healthcare services in Nigeria.

The growth rate of health spending in Nigeria exhibited a fluctuating trend throughout the study period (see Figure 3). The highest growth rate was observed in 1998, which can be attributed to specific government policies, public health trends and budgetary decisions during that period. For instance, Nigeria faced an outbreak of Lassa fever between 2005 and 2008 (Ehichioya *et al.*, 2010), prompting increased health expenditure for disease control, prevention and treatment. However, the growth rate of health expenditure growth rate did not demonstrate a consistent correlation with GDP growth. Furthermore, in 2021, both health spending and GDP growth rates fell below zero (see Figure 4).

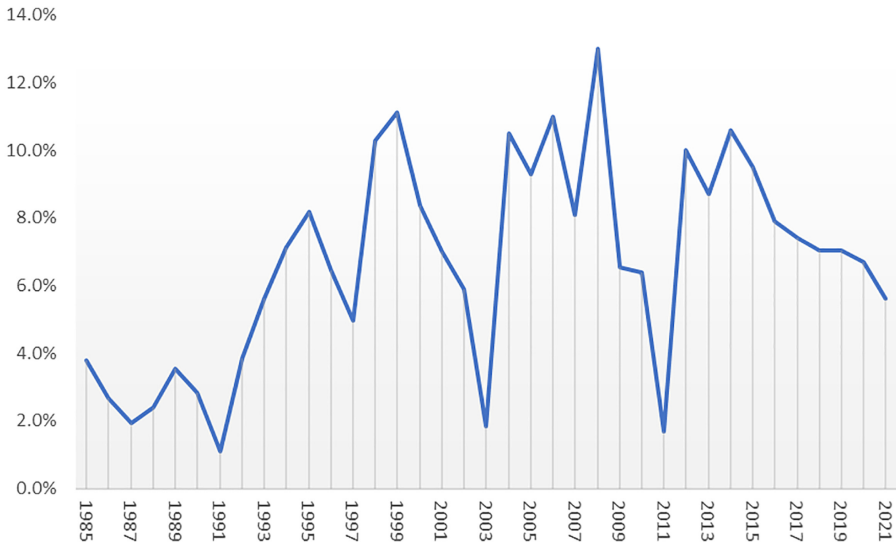


Figure 1.
Budgetary allocation to education (% total allocation)

Source(s): The Nigerian Government and theWDI, World Bank
Figures computed by authors

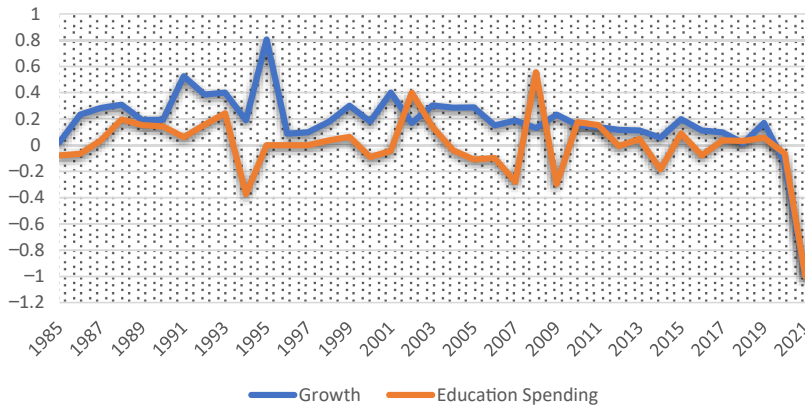


Figure 2.
Growth rate of GDP and education spending in Nigeria (1985–2021)

Source(s): The Nigerian Government and theWDI, World Bank
Figures computed by authors

The Nigerian government's expenditure on R&D has also been notably low, with a fluctuating growth rate ranging between -1 and 2.5 throughout the study period (see [Figure 4](#)). Notably, as shown in [Figures 1, 3 and 4](#), in 2021, GDP growth rates, as well as education, health and R&D spending, experienced a significant decline, falling below zero. This suggests that investment in education, health and R&D, which represent socio-economic governance policies, may harm economic growth in Nigeria.

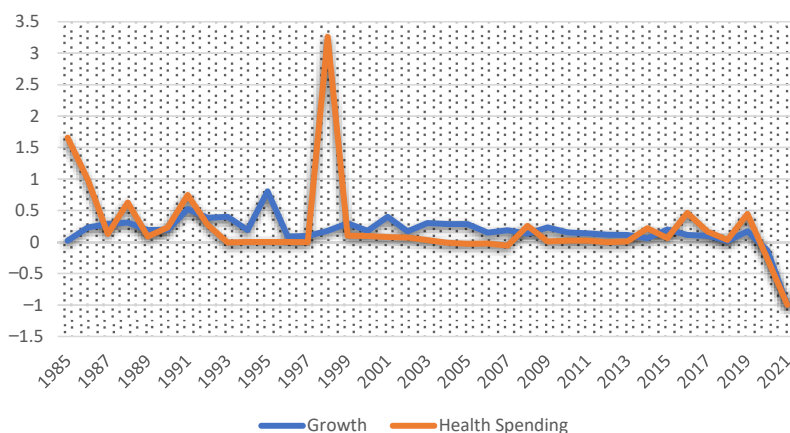


Figure 3. Growth rate of GDP and health spending in Nigeria (1985–2021)

Source(s): The WDI, World Bank
Figure computed by authors

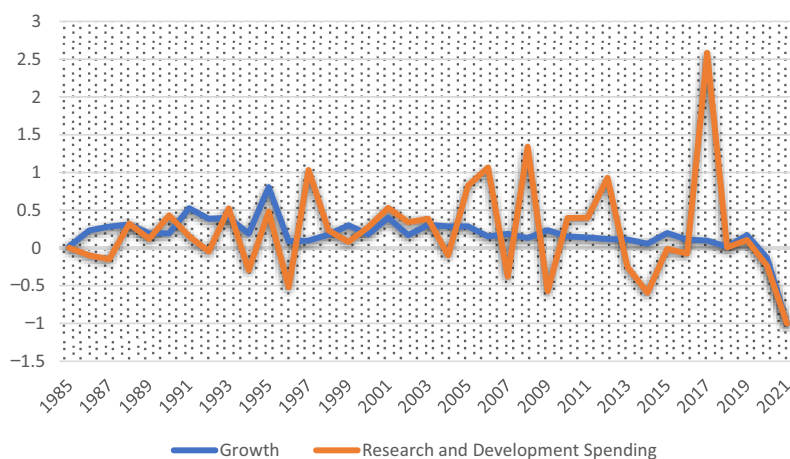


Figure 4. Growth rate of GDP and research and development spending in Nigeria (1985–2021)

Source(s): The WDI, World Bank
Figure computed by authors

5. Data analysis and empirical results

The study utilized secondary data from 1985 to 2021 to examine the impact of socio-economic governance on economic growth, particularly focusing on the period of the structural adjustment program. The data were obtained from the Central Bank of Nigeria (CBN) statistical bulletin and the World Development Indicators of the World Bank. This section analyses the collected data based on an established theoretical framework. Directly analyzing time series data can be challenging due to inherent constraints that, if left unaddressed, can affect the overall research outcome. Therefore, we conducted stationary tests on the time series data to avoid spurious and meaningless results. The Augmented Dickey–Fuller (ADF)

and Phillips–Perron (PP) methods were employed for this purpose. As presented in [Table 1](#), the results indicate that 3 out of the 7 variables are stationary at levels, while the others are stationary at the first difference. For example, PEE, GDP, and expenditure on R&D are stationary at levels, whereas spending on health is stationary at the first difference. This implies the potential for a long-run relationship among the variables in the models.

Based on the unit root results in [Tables 1](#) and it can be inferred that the series exhibit a mixed order of integration. This implies that the previously mentioned linear form of ordinary least squares (OLS) can only be used to estimate the ARDL Model. According to [Shrestha and Bhatta \(2018\)](#), when the unit root results show a mixed order of integration (i.e. I (0) and I (1)), or when they are integrated at the same order, I (1), the appropriate methodological framework is to apply ARDL to avoid obtaining spurious results in the estimates.

This study estimates four models. The first model is the baseline model, which examines the effect of socio-economic governance indicators (PEE, PEH and PER) on economic growth. Model II assesses the impact of PEE on economic growth, Model III estimates the effect of PEH, and Model IV evaluates the effect of PER on economic growth.

[Table 2](#) in the bound test demonstrates a long-run relationship in all the models. Additionally, it reveals that the coefficient of the first indicator of socio-economic governance, PEE, is positive (0.924), indicating a positive relationship between PEE and Nigeria’s GDP in the long run, which aligns with our expectations. This finding is consistent with Model II, which estimates the effect of PEE on economic growth and reports a coefficient of 1.051. It implies that investment in education has a positive impact on long-term economic growth. Education equips individuals with the necessary skills and knowledge to contribute meaningfully to the workforce, making an educated workforce crucial for the growth and development of any economy. In Nigeria, investment in education can help cultivate a skilled workforce capable of addressing the challenges of the modern economy ([World Bank, 2021](#); [Eregha et al., 2018](#)). Moreover, education can foster entrepreneurship, which is crucial for economic growth in Nigeria. By providing individuals with the skills and knowledge needed to start and manage businesses, education creates new opportunities for economic growth and development. However, in the short run, investment in education does not significantly impact economic growth in Nigeria.

Variable	ADF			PP		
	I(0)	I(1)	Remark	I(0)	I(1)	Remark
GDP	-3.699*** (0.009)		I(0)	-3.064** (0.039)		I(0)
PEE	-2.877* (0.058)		I(0)	-2.792* 0.069		I(0)
PER	-3.578** (0.011)		I(0)	-3.600** (0.011)		I(0)
PEH	-0.779 (0.813)	-7.791*** (0.000)	I(1)	-0.297 (0.916)	-14.975*** (0.000)	I(1)
CAP	-1.307 (0.616)	-4.390*** (0.001)	I(1)	-1.178 (0.673)	-4.460*** (0.001)	I(1)
LAB	0.691 (0.990)	-3.393** (0.018)	I(1)	1.423 (0.999)	-2.808* (0.068)	I(1)
FDI	-2.068 (0.258)	-10.311*** (0.000)	I(1)	-2.600 (0.102)	-10.752*** (0.000)	I(1)

Table 1. Summary of the result of the Augmented Dickey–Fuller and Phillips–Perron Test Statistic

Note(s): ***, ** and * indicate significance level at 1%, 5 and 10%

Source(s): Computed by authors using Eviews 10

VRB	Dependent Vrb: GDP			
	Model I:ARDL (3, 3, 3, 3, 3, 2, 3)	Model II_PEE: ARDL (6, 2, 3, 3, 3)	Model III_PER: ARDL (2, 1, 0, 0, 4)	Model IV_PEH: ARDL (2, 1, 0, 0, 3)
F-stat	12.696	9.920	10.463	9.746
<i>k</i>	6	4	4	4
I(0) (5%)	2.27	2.56	2.56	2.56
I(1) (5%)	3.28	3.49	3.49	3.49
PEE	0.924*** (0.002)	1.051*** (0.006)		
PER	0.403*** (0.002)		0.709*** (0.006)	
PEH	-0.159 (0.119)			-0.443** (0.045)
CAP	0.213* (0.063)	1.184*** (0.002)	0.460* (0.079)	1.023*** (0.000)
LAB	5.377*** (0.000)	-1.696 (0.497)	-0.958 (0.556)	1.597 (0.367)
FDI	-0.178*** (0.004)	-0.200** (0.049)	-0.447*** (0.000)	-0.628*** (0.000)
C	-94.337*** (0.000)	23.155 (0.567)	10.832 (0.686)	-36.628 (0.224)
Short Run: Error-Correction Representation				
D(PEE)	-0.059 (0.692)	0.300* (0.087)		
D(PER)	0.636*** (0.002)		0.098 (0.182)	
D(PEH)	-0.158* (0.084)			-0.013 (0.769)
D(CAP)	-0.492** (0.033)	-0.199 (0.486)	0.143 (0.151)	0.279*** (0.004)
D(LAB)	1.336 (0.282)	0.835 (0.609)	-0.299 (0.518)	0.436 (0.435)
D(FDI)	0.029 (0.222)	0.070* (0.084)	-0.0005 (0.983)	-0.038 (0.102)
C	-111.942*** (0.006)	16.426 (0.497)	3.377 (0.665)	-10.002 (0.315)

Note(s): * Selected based on Schwarz Bayesian Criterion

***, ** and * indicate the significance level at 1%, 5% and 10%, respectively

Source(s): Computed by authors using Eviews 10

Table 2.
Estimated ARDL long-run coefficients

Similarly, the second measure of socio-economic governance is investment in R&D. The coefficient of public expenditure on R&D (PER) is positive at 0.403, indicating a positive relationship between PER and Nigeria's GDP, consistent with our expectations (see Model I in Table 2). This suggests that increased investment in R&D will enhance Nigeria's economic growth. Model III also shows a positive effect of investment in R&D on economic growth, with a larger magnitude for PER in Model III compared to Model I. Investment in R&D can lead to the development of new technologies and production processes, enhancing the efficiency and productivity of businesses (Okokpuije *et al.*, 2018). This, in turn, can result in higher output and lower costs, contributing to economic growth. In addition, by investing in R&D, Nigerian firms can develop new products and technologies that give them a competitive advantage in the global market, leading to increased exports and higher revenues, thus fostering economic growth.

Investment in R&D also creates new jobs in R&D and related industries, reducing unemployment, increasing household income, stimulating consumer spending and contributing to economic growth (Blanco *et al.*, 2016; Silvia, 2015). In addition, R&D can improve the quality of life of Nigerians by fostering the development of new medical technologies that improve healthcare outcomes and new agricultural technologies that increase food security and reduce poverty. However, it is worth noting that the effects of R&D may depend on the levels of human capital and development (Blanco *et al.*, 2016). States with higher levels of human capital tend to exhibit higher own-state and other-state R&D elasticities, while states in the lowest tier of economic development have the most negligible own-state R&D elasticity but the highest additional R&D elasticity. In the short run, the result shows that investment in R&D is statistically significant only in Model I, which includes all the indicators of socio-economic governance.

Lastly, Model IV in Table 2 demonstrates that public health investment negatively affects economic growth, contrary to *a priori* expectations. The coefficient of PEH is negative, indicating a negative relationship between PEH and Nigeria's GDP. However, in Model I, where all the indicators of socio-economic governance are included, the coefficient of PEH is negative but not statistically significant. Therefore, it is possible that investment in health may not have a significant impact on economic growth when considered alongside other socio-economic governance policies.

A healthy population is recognized to have the potential to increase productivity since healthy individuals are more likely to work, learn and engage in economic activities (Lawanson and Umar, 2021; Okereke and Ofierohor, 2018). This, in turn, can lead to higher output and lower costs, contributing to overall economic growth. Additionally, investment in health can play a crucial role in reducing the burden of disease and illness, thereby resulting in lower healthcare costs. By freeing up resources, this reduction can be directed toward other sectors such as education and infrastructure, which are known contributors to economic growth. However, the findings of this study present a different perspective, revealing a negative relationship between investment in health and economic growth in Nigeria in the long run. It is important to note that this negative effect may occur when a country overinvests in health, diverting resources away from other vital sectors such as education, infrastructure and R&D. Such diversion can have adverse consequences on overall economic growth. Model IV exemplifies this situation by solely including investment in health, while assuming zero investment in education and R&D. Another critical factor to consider is the targeting of health investments. If these investments are not appropriately directed and fail to achieve the desired impact on health outcomes, they can lead to wasted resources and negatively affect economic growth.

6. Conclusion

The study focused on examining the impact of socio-economic governance on economic growth in Nigeria, specifically from the perspective of fiscal policy. It introduced a distinctive approach by considering the role of factors such as investment in education, R&D and health in assessing the effectiveness of socio-economic governance in promoting economic growth. This comprehensive framework provides valuable insights into the relationship between governance and economic growth.

This study highlights the crucial role of investment in education and R&D in driving long-term economic growth in Nigeria. By highlighting the positive effects of these factors, this paper underscores the importance of implementing policies that prioritize these areas to foster sustainable economic growth and development. Additionally, the findings revealing the adverse impact of overinvestment in the health sector on economic growth offer valuable

insights for policymakers. It emphasizes the need for a balanced resource allocation across sectors, including education, infrastructure and R&D, to ensure overall economic growth.

In conclusion, the study asserts that socio-economic policies aimed at increasing investment in education are vital for Nigeria's economic growth. By equipping individuals with the necessary skills, knowledge and opportunities to actively contribute to the economy, education plays a pivotal role in driving economic growth and development in Nigeria. The study also concludes that socio-economic policies that promote investment in R&D positively impact economic growth in Nigeria. However, to fully realize the potential of R&D, Nigeria should invest more in establishing a robust R&D infrastructure, fostering collaboration between academia and industry, and cultivating a culture of innovation and entrepreneurship. Furthermore, while investment in health generally has a positive impact on economic growth, it is crucial to ensure that health investments are properly targeted and balanced with investments in other sectors to maximize their impact. Additionally, external factors such as economic shocks can influence both health and economic growth, warranting careful consideration in policy formulation.

References

- Abubakar, M. (2023), "Globalisation and output growth nexus in sub-saharan Africa: the critical role of trade liberalisation", *Journal of the Knowledge Economy*. doi: [10.1007/s13132-023-01230-y](https://doi.org/10.1007/s13132-023-01230-y).
- Adamu, P.A. (2002), "The impact of human capital formation on economic development in Nigeria: an error correction approach", *Human Resource Development in Africa, 2002 Annual Conference*, Nigerian Economic Society, Ibadan, pp. 53-78.
- Adawo, M.A. (2011), "Has education (human capital) contributed to the economic growth of Nigeria?", *Journal of Economics and International Finance*, Vol. 3 No. 1, pp. 46-58, doi: [10.5897/JEIF.9000058](https://doi.org/10.5897/JEIF.9000058).
- Adegboyege, A. (2023), "World Bank names Nigerian, other CEOs to scale transition finance in emerging markets | Premium Times Nigeria", available at: <https://www.premiumtimesng.com/business/business-news/609157-world-bank-names-nigerian-other-ceos-to-scale-transition-finance-in-emerging-markets.html>
- Adetula, D., Adesina, K., Owolabi, F. and Stephen, O. (2017), "Investment in education for the Nigerian economic development", *The Journal of Internet Banking and Commerce*, Vol. 22 No. 1, pp. 1-15.
- Adeyemi, P.A. and Ogunsola, A.J. (2016), "The impact of human capital development on economic growth in Nigeria: ARDL approach", *IOSR Journal of Humanities and Social Science*, Vol. 21 No. 3, pp. 1-7.
- Ajadi, O.T. and Adebakin, A.B. (2014), "Human capital development as a correlate of economic growth in Nigeria", *The African Symposium: An Online Journal of the African Educational Research Network*, Vol. 14 Nos 1-2, pp. 133-139.
- Akinlo, A.E. and Okunlola, O.C. (2022), "On the interaction between export promotion and agricultural growth in poverty reduction in Nigeria: empirical evidence for the period 1980-2016", *Journal of Economic Development*, Vol. 47 No. 1, pp. 109-134.
- Akwe, J. and Hall, M.A.K. (2023), "Primary care considerations for elderly U.S. Veterans of World war II and the Korean war: a narrative review", *Cureus*, Vol. 15 No. 4, e37309, doi: [10.7759/cureus.37309](https://doi.org/10.7759/cureus.37309).
- Aqib, M. and Zaman, K. (2023), "Greening the workforce: the power of investing in human capital". doi: [10.5281/ZENODO.7620041](https://doi.org/10.5281/ZENODO.7620041).
- Attahir, B.A., Ahmad, S.B. and Abdullahi, A.M. (2020), "To what extent does human capital development impact economic growth? Empirical evidence from Nigeria", *Research Square*. doi: [10.21203/rs.3.rs-65418/v1](https://doi.org/10.21203/rs.3.rs-65418/v1).
- Aurangzeb, A. (2003), "Relationship between health expenditure and GDP in an augmented Solow growth model for Pakistan: an application of Co-integration and error-correction modeling", *The Lahore Journal of Economics*, Vol. 8, pp. 1-16, doi: [10.35536/lje.2003.v8.i2.a1](https://doi.org/10.35536/lje.2003.v8.i2.a1).

- Bakare, A.S. and Olubokun, S. (2011), "Health care expenditure and economic growth in Nigeria: an empirical study", *Journal of Emerging Trends in Economics and Management Sciences*, Vol. 2 No. 2, pp. 83-87, doi: [10.10520/EJC133895](https://doi.org/10.10520/EJC133895).
- Baldacci, E., Clements, B., Gupta, S. and Cui, Q. (2004), "Social spending, human capital, and growth in developing countries: implications for achieving the MDGs".
- Bayraktar, Y., DüNDAR, N. and Özyılmaz, A. (2022), "The relationship between R&D expenditures and economic growth in BRICS-T countries", *Eskişehir Osmangazi Üniversitesi İktisadi Ve İdari Bilimler Dergisi*, Vol. 17 No. 3, pp. 893-910, doi: [10.17153/oguiibf.1151022](https://doi.org/10.17153/oguiibf.1151022).
- Blanco, L.R., Gu, J. and Prieger, J.E. (2016), "The impact of research and development on economic growth and productivity in the U.S. States: impact of R&D on growth & productivity in U.S.", *Southern Economic Journal*, Vol. 82 No. 3, pp. 914-934, doi: [10.1002/soej.12107](https://doi.org/10.1002/soej.12107).
- Bloom, D.E., Canning, D. and Sevilla, J. (2004), "The effect of health on economic growth: a production function approach", *World Development*, Vol. 32 No. 1, pp. 1-13, doi: [10.1016/j.worlddev.2003.07.002](https://doi.org/10.1016/j.worlddev.2003.07.002).
- Bloom, D.E., Kuhn, M. and Prettnner, K. (2018), "Health and economic growth", IZA DP No. 11939(DISCUSSION PAPER SERIES), available at: <https://docs.iza.org/dp11939.pdf>
- Bor, Y.J., Chuang, Y.-C., Lai, W.-W. and Yang, C.-M. (2010), "A dynamic general equilibrium model for public R&D investment in Taiwan", *Economic Modelling*, Vol. 27 No. 1, pp. 171-183, doi: [10.1016/j.econmod.2009.08.007](https://doi.org/10.1016/j.econmod.2009.08.007).
- Borojo, D.G. and Jiang, Y. (2016), "The impact of Africa-China trade openness on technology transfer and economic growth for Africa: a dynamic panel data approach", *Annals of Economics and Finance*, Vol. 17 No. 2, pp. 403-431.
- Chaudhry, I. and Rahman, S. (2009), "The impact of gender inequality in education on rural poverty in Pakistan: an empirical analysis", *European Journal of Economics, Finance and Administrative Sciences*, Vol. 15, pp. 174-188.
- Chete, L.N. and Adeoye, B.W. (2001), "Human capital and economic growth: the Nigerian experience", *Human Resource Development in Africa. 2002 Annual Conference*, Nigerian Economic Society, Ibadan, pp. 79-102.
- dereli, D. and Salgar, U. (2019), "Relationship between R&D expenditures and economic growth: an evaluation on Turkey", *Journal of Life Economics*, Vol. 6, pp. 345-360, doi: [10.15637/jlecon.6.021](https://doi.org/10.15637/jlecon.6.021).
- Development Initiatives (2021), *Development Initiatives' Progress Report 2021*, Development Initiatives, available at: <https://devinit.org/resources/development-initiatives-progress-report-2021/>
- Eggoh, J., Houeninvo, H. and Sossou, G.-A. (2015), "EDUCATION, health and economic growth in African countries", *Journal of Economic Development*, Vol. 40 No. 1, pp. 93-111.
- Ehichioya, D.U., Hass, M., Ölschläger, S., Becker-Ziaja, B., Chukwu, C.O.O., Coker, J., Nasidi, A., Ogugua, O.-O., Günther, S. and Omilabu, S.A. (2010), "Lassa fever, Nigeria, 2005-2008", *Emerging Infectious Diseases*, Vol. 16 No. 6, pp. 1040-1041, doi: [10.3201/eid1606.100080](https://doi.org/10.3201/eid1606.100080).
- Elmi, Z.M. and Sadeghi, S. (2012), "Health care expenditures and economic growth in developing countries: panel Co-integration and causality".
- Eregha, P.B., Irughe, R.I. and Edafe, J. (2018), "Education and economic growth: empirical evidence from Nigeria", *Managing Global Transitions*, Vol. 16 No. 1, pp. 59-77, doi: [10.26493/1854-6935.16.59-77](https://doi.org/10.26493/1854-6935.16.59-77).
- Eryigit, S.B., Eryigit, K.Y. and Selen, U. (2012), "The long-run linkages between education, health and defence expenditures and economic growth: evidence from Turkey", *Defence and Peace Economics*, Vol. 23 No. 6, pp. 559-574, doi: [10.1080/10242694.2012.663577](https://doi.org/10.1080/10242694.2012.663577).
- Hanushek, E.A. and Woessmann, L. (2008), "The role of cognitive skills in economic development", *Journal of Economic Literature*, Vol. 46 No. 3, pp. 607-668, doi: [10.1257/jel.46.3.607](https://doi.org/10.1257/jel.46.3.607).
- Ifionu, E.P. and Nteegah, A. (2013), "Investment in education and economic growth in Nigeria: 1981-2012", *West African Journal of Industrial and Academic Research*, Vol. 9 No. 1.
- Jorgenson, D.W. and Fraumeni, B.M. (1992), "Investment in education and U.S. Economic growth", *The Scandinavian Journal of Economics*, Vol. 94, pp. S51-S70, doi: [10.2307/3440246](https://doi.org/10.2307/3440246).

- Kareem, R.O., Arije, R.A., Zakariyah, A.O. and Ayovome, Y.H. (2020), "Natural resources endowment, human capital development and economic growth in Nigeria", *Izvestiya Journal of Varna University of Economics*, Vol. 64 No. 1, pp. 26-46.
- Keji, S.A. (2021), "Human capital and economic growth in Nigeria", *Future Business Journal*, Vol. 7, p. 49, doi: [10.1186/s43093-021-00095-4](https://doi.org/10.1186/s43093-021-00095-4).
- Klenow, P.J. and Rodríguez-Clare, A. (1997), "The neoclassical revival in growth economics: has it gone too far?", *NBER Macroeconomics Annual*, Vol. 12, pp. 73-103, doi: [10.1086/654324](https://doi.org/10.1086/654324).
- Lawanson, O.I. and Umar, D.I. (2021), "The life expectancy–economic growth nexus in Nigeria: the role of poverty reduction", *SN Business & Economics*, Vol. 1 No. 10, p. 127, doi: [10.1007/s43546-021-00119-9](https://doi.org/10.1007/s43546-021-00119-9).
- Lucas, R.E. (1988), "On the mechanics of economic development", *Journal of Monetary Economics*, Vol. 22, pp. 3-42.
- Mandiefe, S.P. and Chupezi, J.T. (2015), "Contribution of public health investments to the economic growth of Cameroon", *Business and Economics Journal*, Vol. 06, doi: [10.4172/2151-6219.1000189](https://doi.org/10.4172/2151-6219.1000189).
- Mankiw, N.G., Romer, D. and Weil, D.N. (1992), "A contribution to the empirics of economic growth", *The Quarterly Journal of Economics*, Vol. 107 No. 2, pp. 407-437, doi: [10.2307/2118477](https://doi.org/10.2307/2118477).
- Migała-Warchoł, A. (2019), "The research of socio-economic development in the European union countries with an application of the modified HDI indicator", *The Turkish Online Journal of Educational Technology*, Vol. 18 No. 2.
- Ndiyo, N. A. (2003), "On productivity and technology diffusion in Nigeria", *South African Journal of Economic and Management Sciences*, Vol. 6 No. 4, pp. 848-867.
- NHA (2016), "National health policy 2016", available at: file:///C:/Users/Okunlola%20Olalekan%20C/Downloads/draft_nigeria_national_health_policy_final_december_fmoh_edited.pdf
- NHS Confederation (2022), "Analysis: the link between investing in health and economic growth | NHS Confederation", available at: <https://www.nhsconfed.org/publications/analysis-link-between-investing-health-and-economic-growth>
- Obi, Z.C. and Obi, C.O. (2014), "Impact of government expenditure on education: the Nigerian experience", *International Journal of Business and Finance Management Research*, Vol. 2 No. 2104, pp. 42-48.
- Ogujiuba, K. (2013), "The impact of human capital formation on economic growth in Nigeria", *Journal of Economics*, Vol. 4 No. 2, pp. 121-132.
- Okereke, E. and Ofierohor, U. (2018), "Health finance and economic growth in Nigeria", *Proceedings of Business and Management Conferences*, 6810240, available at: <https://ideas.repec.org/p/sek/ibmpro/6810240.html>
- Okokpujie, I.P., Fayomi, O.S.I. and Leramo, R.O. (2018), "The role of research in economic development", *IOP Conference Series: Materials Science and Engineering*, Vol. 413 No. 1, 012060, doi: [10.1088/1757-899X/413/1/012060](https://doi.org/10.1088/1757-899X/413/1/012060).
- Okunlola, O.C. (2019), "Political regime types and economic development in Nigeria: significance of conflict and corruption", *Journal of Interdisciplinary Economics*, Vol. 31 No. 1, pp. 1-34, doi: [10.1177/0260107918769539](https://doi.org/10.1177/0260107918769539).
- Okunlola, O.C. and Akinlo, A.E. (2021), "The impact of export promotion scheme on agricultural growth in Nigeria", *African Journal of Economic Review*, Vol. 9 No. 1, pp. 60-86.
- Okunlola, O.C. and Okafor, I.G. (2022), "Conflict–Poverty relationship in Africa: a disaggregated approach", *Journal of Interdisciplinary Economics*, Vol. 34 No. 1, pp. 104-129, doi: [10.1177/0260107920935726](https://doi.org/10.1177/0260107920935726).
- Oladeji, A.O. (2015), "Impact of human capital development on economic growth in Nigeria", *International Journal of Recent Research in Commerce Economics and Management*, Vol. 2 No. 2, pp. 151-164.
- Olalekan, O. (2014), "Human capital and economic growth in Nigeria", *International Journal of Innovation and Scientific Research*, Vol. 11 No. 2, pp. 291-294.

- Oni, L. (2014), "Analysis of the growth impact of health expenditure in Nigeria", *IOSR Journal of Economics and Finance*, Vol. 3, pp. 77-84, doi: [10.9790/5933-03117784](https://doi.org/10.9790/5933-03117784).
- Onyedinefu, G. (2022), *Nigeria's Illiteracy Rate Is Now 31%, Says FG*, Businessday NG, available at: <https://businessday.ng/news/article/nigerias-illiteracy-rate-is-now-31-says-fg/>
- Orji, A., Kamenov, K., Dirac, M., Davis, A., Chadha, S. and Vos, T. (2020), "Global and regional needs, unmet needs and access to hearing aids", *International journal of audiology*, Vol. 59 No. 3, pp. 166-172.
- Orosz, Á. and Szijártó, N. (2021), "Socio-economic governance in the EU", *Public Governance Administration And Finance Law Review in The European Union and Central Eastern Europe*, Vol. 6 No. 2, 2.
- Ozyilmaz, A., Bayraktar, Y., Isik, E., Toprak, M., Er, M.B., Besel, F., Aydin, S., Olgun, M.F. and Collins, S. (2022), "The relationship between health expenditures and economic growth in EU countries: empirical evidence using panel fourier toda–yamamoto causality test and regression models", *International Journal of Environmental Research and Public Health*, Vol. 19 No. 22, 15091, doi: [10.3390/ijerph192215091](https://doi.org/10.3390/ijerph192215091).
- Pesaran, H.H. and Shin, Y. (1998), "Generalized impulse response analysis in linear multivariate models", *Economics Letters*, Vol. 58 No. 1, pp. 17-29, doi: [10.1016/S0165-1765\(97\)00214-0](https://doi.org/10.1016/S0165-1765(97)00214-0).
- Pesaran, M.H., Shin, Y. and Smith, R.J. (2001), "Bounds testing approaches to the analysis of level relationships", *Journal of Applied Econometrics*, Vol. 16 No. 3, pp. 289-326.
- Piabu, S.M. and Tieguhong, J.C. (2017), "Health expenditure and economic growth—a review of the literature and an analysis between the economic community for central African states (CEMAC) and selected African countries", *Health Economics Review*, Vol. 7 No. 1, p. 23, doi: [10.1186/s13561-017-0159-1](https://doi.org/10.1186/s13561-017-0159-1).
- Ramdorai, J.R., Wilson, M. and Aditi (2020), *How Investing in Health Has a Significant Economic Payoff for Developing Economies*, Brookings, available at: <https://www.brookings.edu/blog/future-development/2020/07/21/how-investing-in-health-has-a-significant-economic-payoff-for-developing-economies/>
- Romer, P.M. (1989), *Human Capital and Growth: Theory and Evidence*, National Bureau of Economic Research.
- Romer, P.M. (1990), "Endogenous technological change", *Journal of Political Economy*, Vol. 98 No. 5, pp. S71-S102, available at: <http://www.jstor.org/stable/2937632>
- Romer, P.M. (1994), "The origins of endogenous growth", *Journal of Economic Perspectives*, Vol. 8 No. 1, pp. 3-22, doi: [10.1257/jep.8.1.3](https://doi.org/10.1257/jep.8.1.3).
- Rostow, W.W. (1960), *The Stages of Economic Growth: A Non-communist Manifesto*, Cambridge University Press, Cambridge.
- Shrestha, M.B. and Bhatta, G.R. (2018), "Selecting appropriate methodological framework for time series data analysis", *The Journal of Finance and Data Science*, Vol. 4 No. 2, pp. 71-89, doi: [10.1016/j.jfds.2017.11.001](https://doi.org/10.1016/j.jfds.2017.11.001).
- Silvia, A. (2015), *The Impact of R&D Investment on Economic Performance: A Review of the Econometric Evidence. DSTI/EAS/STP/NESTI(2015)8*, Organisation for Economic Co-operation and Development.
- Solow, R. (1956), "A contribution to the theory of economic growth", *Quarterly Journal of Economics*, Vol. 70, pp. 65-94.
- Swan, T.W. (1956), "ECONOMIC GROWTH and CAPITAL ACCUMULATION", *Economic Record*, Vol. 32 No. 2, pp. 334-361, doi: [10.1111/j.1475-4932.1956.tb00434.x](https://doi.org/10.1111/j.1475-4932.1956.tb00434.x).
- Türedi, S. (2016), "The relationship between R&D expenditures, patent applications and growth: a dynamic panel causality analysis for oecd countries", available at: <https://earsiv.anadolu.edu.tr/xmlui/handle/11421/25160>

-
- Ulger, O. and Uçan, O. (2018), “R&D expenditures—growth nexus in Turkey”, 91060, MPRA Paper, available at: <https://ideas.repec.org/p/pramprapa/91060.html>
- UNESCO (2016), *Education for People and Planet: Creating Sustainable Futures for All. Global Education Monitoring Report*, UNESCO Digital Library, available at: <https://unesdoc.unesco.org/ark:/48223/pf0000245752>
- United Nations (2022), “Towards 2021/2022 human development report”, *Human Development Reports*, United Nations, available at: <https://hdr.undp.org/towards-hdr-2022>
- Wakelin, K. (2001), “Productivity growth and R&D expenditure in UK manufacturing firms”, *Research Policy*, Vol. 30 No. 7, pp. 1079-1090, doi: [10.1016/S0048-7333\(00\)00136-0](https://doi.org/10.1016/S0048-7333(00)00136-0).
- Wang, H. and Wu, D. (2015), “An explanation for China’s economic growth: expenditure on R&D promotes economic growth —based on China’s provincial panel data of 1997-2013”, *Journal of Service Science and Management*, Vol. 8 No. 6, doi: [10.4236/jssm.2015.86082](https://doi.org/10.4236/jssm.2015.86082).
- WHO (2013), *World Health Report 2013: Research for Universal Health Coverage*, WHO | Regional Office for Africa, available at: <https://www.afro.who.int/publications/world-health-report-2013-research-universal-health-coverage>
- World Bank (2016), *Nigeria’s Booming Population Requires More and Better Jobs*, [Text/HTML], World Bank, available at: <https://www.worldbank.org/en/news/press-release/2016/03/15/nigerias-booming-population-requires-more-and-better-jobs>
- World Bank (2021), *Skills Development*, World Bank, available at: <https://www.worldbank.org/en/topic/skillsdevelopment>
- World Bank (2023), “World development indicators | DataBank”, available at: <https://databank.worldbank.org/source/world-development-indicators>
- World Economic Forum (2015), *Global Competitiveness Report 2015*, World Economic Forum, available at: <https://www.weforum.org/reports/global-competitiveness-report-2015/>
- World Health Organization (2015), “The World health report 2005”, *Make Every Mother and Child Count*, available at: <https://www.who.int/publications-detail-redirect/9241562900>
- Wu, C.-F., Chang, T., Wang, C.-M., Wu, T.-P., Lin, M.-C. and Huang, S.-C. (2021), “Measuring the impact of health on economic growth using pooling data in regions of asia: evidence from a quantile-on-quantile analysis”, *Frontiers in Public Health*, Vol. 9, available at: <https://www.frontiersin.org/articles/10.3389/fpubh.2021.689610>
- Yao, X., Hu, Y., Gong, H. and Chen, D. (2021), “Characteristics and evolution of China’s industry–university–research collaboration to promote the sustainable development: based on policy text analysis”, *Sustainability*, Vol. 13 No. 23, 23, doi: [10.3390/su132313105](https://doi.org/10.3390/su132313105).
- Yıldız, B.F., Alola, A.A. and Wong, W.-K. (2023), “Socioeconomic development aspects of Democratic Governance across selected countries”, *Democracy and Security*, pp. 1-16, doi: [10.1080/17419166.2023.2178422](https://doi.org/10.1080/17419166.2023.2178422).
- Zaman, K. (2023), “Navigating the perils of a banana republic: lessons from Pakistan’s economic crisis”. doi: [10.5281/ZENODO.7715198](https://doi.org/10.5281/ZENODO.7715198).

Corresponding author

Olalekan Charles Okunlola can be contacted at: okunlolalekan@yahoo.com

For instructions on how to order reprints of this article, please visit our website:

www.emeraldgrouppublishing.com/licensing/reprints.htm

Or contact us for further details: permissions@emeraldinsight.com