

SOCIO-ECONOMIC INDICATORS AND ECONOMIC GROWTH: A STUDY OF NIGERIA AND SOUTH AFRICA

Olabode Eric Olabisi*, **Usenobong James Effiong**

*Department of Economics, Faculty of Humanities, Social and Management Sciences,
Elizade University, Ilara-Mokin, Ondo State, Nigeria.*

olabode.olabisi@yahoo.com

usenjames4@gmail.com

Abstract: *The research on the determinants of economic growth has taken a new dynamic pattern in the recent times. More studies are now explaining the need to better consider the socio-economic indicators that promote economic growth across the globe. Hence, this paper examined the relationship between socio-economic indicators and economic growth in both Nigeria and South Africa covering the period 1999–2020. Ordinary Least Squares (OLS) estimation technique was employed. The results of the study show that secondary school enrollment and employment are positive and significant in driving the economic growth of both Nigeria and South Africa. However, inflation and mortality rate reduce economic growth in both countries. But in South Africa, life expectancy reveals a negative impact on economic growth. The empirical outcomes of the study can be used by the government to formulate policies that can promote human capital development and employment creation. It can also assist the government in formulating monetary policies that can reduce the outburst of inflation.*

Keywords: Socio-economic indicators, Nigeria, South Africa, Life expectancy, Mortality rate, Birth rate

JEL Classifications: B55, J13, O47, O49

1. Introduction

Economic growth is a major metric that economists employ to determine the economic health of a country or region. Just like several other macroeconomic measures of a country's well-being, economic growth is a product of many moving parts of countries macroeconomic indicators. To have a near-accurate approximation of the determinants of economic growth in any country, several investigative questions must be asked about the contributing factors to ensure that high-impact variables are not left out. These factors cut across diverse components of a nation's economy, which include: market factors, technological factors, environmental factors, political factors and the broadly defined socio-economic factors. While the market and technological factors are often fairly represented when investigating the causes of a country's economic growth, socio-economic factors rarely get a fair share of representation. As a result, insights that inform policy actions are drawn from a deficient analysis. Policies derived this way often end up redundant and unable to reflect positively on a country's economic performance.

* Corresponding author: Olabode Eric Olabisi

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The growth of a nation is often approximated by additional value made to its existing wealth. That includes both human and material resources. In Kuznets (1973) research work, economic growth is defined as a long-term rise in capacity to supply increasingly diverse economic goods to its population. These diverse economic goods include; natural resources, reproductive resources as well as accumulated capital. Modern definitions have come to capture economic growth as growth in per capita income (output), growth in productivity (output per unit of input), structural transformation - shift away from agriculture and primary production, and growth of the service sector (Kuznets, 1973; Popova & Podolyakina, 2014). There are many dynamic processes and moving parts that feed into what termed as economic growth. In sub-Saharan Africa and most of the third world countries, there is incipient unrest emanating from changes in social and economic structures (Kuznets, 1973) . It goes without saying that these changes would link into, and leave some effects on the macro-economy. These effects, especially those traceable to changes in social structures, are of particular interest because they are often not reflected or under-represented in the current measures of economic growth. The increasing realization of the shortcoming of the measures has stimulated lively discussion of the limits and limitations of economic measurement of economic growth.

Socio-economic indicators link the social life or situation of a population to its economy in general. This group of indicators consist of the numerous components of economic measures highlighting the outcome of relationships between behavioral interactions of individuals and groups, and the performance of the economic territory in which they operate. Socio-economic indicators are often non-market economic variables that can influence the measurable performance of individuals in an economy. Typical examples include; life expectancy, mortality rate, fertility rate, corruption index, insecurity, terrorism index, inequality, school enrolment, human development index (HDI), literacy rate, etc. (Arik, 2009; Popova & Podolyakina, 2014). Generally, a majority of socio-economic indicators can be conveniently grouped into a number of broad categories which cover crucial components like health, education, urbanization, income distribution, culture, and religion.

Given the above positions, this paper seeks to provide an annual data-driven analytical study for Nigeria and South Africa. This perspective is to offer insights on the impact of socio-economic indicators on both countries. The rest of the paper presents literature review in section 2 while section 3 presents the methodology of the paper. Section 4 presents the analysis of the findings, and lastly, section 5 presents the conclusions and policy implications

1.1 The Nigerian and South African economies: A comparison

On the historical path, Nigeria and South Africa were both colonies of the British colonial government and gained independence almost the same time – 1960 and 1961 respectively. Also, both countries are members of the African Union (AU). According to the 2020 World Population Review (ILO) economic data, unemployment rate in South Africa as at 2020 stood at 28.5 while Nigeria was 16.5 respectively. Labour force participation rate for Nigeria and South were 58.9% and 58.3%. The average life expectancy for Nigeria stood at 59years and 64 years for South Africa, while the crude birth rates stood at 35.2 in Nigeria, and 19.9 in South Africa.

On the other hand, the crude death rate almost ties together at 9.6 in Nigeria and 9.3 in South Africa. Also, the total fertility rate which impacts on the population growth rate of both countries are at 4.6% and 2.26%, respectively, with a median age of 18 years for Nigeria and 27 years for South Africa respectively. It is often argued that a lower median age is considered better for an economy's health, as it is an indication that a majority of the population in these countries are young adults. However, a very low median age may cause high youth unemployment and poverty rates.

The Human Capital Index (HCI) is another strong link between both economies according to World Bank data (2020), which calculates the contributions of health and education to workers' productivity. Both countries have a human HCI of 0.4. The school life expectancy that measure human capital development is 9 years for Nigeria and 14 years for South Africa. By implication, an average Nigerian is expected to have only done 9 years of schooling, while the South African counterpart is expected to do 14 years. Judging in terms of size, the Nigerian economy, often called the giant of Africa because of its robust nature in terms of population and the size of the Gross Domestic Product (GDP). The Nigerian population figure stood at about 200 million, with a population density of 215 per square kilometer while South Africa has a population of about 57 Million and a population density of 47 per square kilometer. According to the World Bank (2021) data base, in 2021, the GDP figures for Nigeria and South Africa stood at \$440 Billion and \$419 Billion respectively. On the grand scheme, these figures put these economies at miles apart. But, when viewed through the socio-economic lens, it becomes obvious that these economies are in fact very similar.

To this end, the following hypotheses are testable:

- H_1 : Life expectancy at birth has a positive impact on economic growth
- H_2 : Mortality rate has a negative impact on economic growth
- H_3 : Secondary school enrollment has a positive impact on economic growth
- H_4 : Energy use has a positive impact on economic growth
- H_4 : Employment rate has a positive impact on economic growth
- H_5 : Inflation has a negative impact on economic growth

2. Socio-Economic Indicators and Economic Growth: A brief literature review

Numerous research efforts have gone into providing both theoretical and empirical evidences on the factors that contribute to what is recognized as economic growth. From a macroeconomic perspective, variables like government spending, foreign direct investment, trade, Inflation rate, exchange rate, interest rate, etc., are employed to draw insight on the determinants of economic growth. However, economic growth in itself is an outcome that is subject to the contribution of factors beyond the economic terrain. Both Solow-Swan and endogenous theories also emphasized the important roles of socio-economic factors such as human capital development, physical capital, labour etc. in promoting economic growth. Kuznets (1973) emphasizes the social implications of some effects of modern economic growth on conditions of life of various population groups in selected countries. Stating that many of these effects are often not reflected in the current measures of economic growth; and "the increasing realisation of the shortcoming of the measures has stimulated lively discussion on limits and limitations of economic measurement of economic growth". Some studies have gone ahead to establish some linkages between non-economic factors and economic growth. For instance, the links between social and political institutions and economic growth (Fedderke & Klitgaard, 2006). the impact of corruption on investment and economic growth (Johnston, 2021; Mauro, 1995), school enrolment (human capital development) and economic growth (Adawo, 2011; Mankiw Gregory et al., 1992; Pantelis Kalaitzidakis, Theofanis P . Mamuneas, 2001; Peaslee, 1967), poverty and economic growth (Dauda, 2017; Muhammad Yusuf, C . A. Malarvizhi, 2019), population and economic growth (Ram, 1981; Toye, 1997).

Temple *et al* (1998) argued that so many predictions have gone awry because researchers sought the origins of long-run growth in the wrong places and neglected the role of "social capability" in economic development (Temple & Johnson, 1998). Fedderke (2006) opines that life expectancy, mortality rate, fertility rate, corruption index, insecurity, inequality is rarely considered when analyzing economic growth. But in reality, when paying closer

attention to the peculiarities of different economies, these social factors could impact growth more significantly than the popularly used macro measures of economic performance (Fedderke and Klitgaard, 2006). In the African context, especially in sub-Saharan Africa, economic growth has been particularly slow. This weak growth performance has remained a subject of debate with no definite explanation on the underlying cause (Barro, 1991).

From the empirical point of view, a number of research exists on the relationship between socio-economic indicators and economic growth. These studies often apply statistical analysis, growth models simulation, or case-studies and comparative analyses to examine the impact of selected socio-economic indicators on other variables. Muhammad *et al* (2019) used the VECM with co-integration test on data from 1970 to 2011 to analyze the causal association between socio-economic indicators like corruption and poverty, on economic growth in Nigeria. Their findings suggest a long-term connection between corruption, poverty, and economic growth in Nigeria. This further validates the evidence from (Barro, 2001; Benhabib & Spiegel, 1994), who simulated the dynamic economic growth model and Solow growth model to examine the relationship between socio-economic indicators like corruption, investment, and education levels, and economic growth. Pantelis *et al* (2001) further emphasized the connection between the development of human capital (presented as mean years of education) and economic growth, using a semi-parametric estimation technique to find potential nonlinearities. Findings from the study presented significant disparities in the growth effect of educational attainment.

In the same vein, using regression analysis, Middendorf (2006) concluded on the presence of a significant relationship between measures of human capital development like educational attainment and health outcomes, and economic growth. Also, Aigbokhan *et al.*(2000) concludes on the existence of an inverse relationship between poverty and economic growth, following a correlation and regression analysis on a time-series data on poverty and economic growth in Nigeria.

Additionally, some studies employed the use of case study or comparative analysis approach in examining the relationships between these variables. For instance, Oyekale (2015) used the case study and comparative analyses to examine the relationship between selected socio-economic indicators, such as infrastructure and human capital development and economic growth in developing countries. Although several empirical works exist, with their respective findings and conclusions, and there is a plethora of methods employed in examining the relationship between these variables; it is important to note that the relationship between socio-economic indicators and economic growth can vary depending on a range of factors. Hence, these research findings are best treated within the confines of the study limitations, and not as absolute truths.

Drawing reference from the empirical works reviewed above, there is a wide application of regression techniques and growth model simulation when examining the relationship between socio-economic indicators and economic growth across a sample of countries. Case-studies and comparative analyses are often used in intra-national analysis, especially when conducting an isolated examination on the growth effect of different socio-economic indicators (Aigbokhan *et al.*, 2000). On a different note, there are limited empirical literatures highlighting the relationship between socio-economic indicators and economic growth within the African context. Also, monetary variables like the inflation rate and economic variables like the employment rate have not been widely applied in the context of socio-economic analysis.

Hence, this study contributes to existing literature by examining the relationship between socio-economic indicators and growth using regression analysis from Nigeria and South Africa from 1999–2020.

3. Data and methodology

The first stage in the calibration process is the gathering of the time series data for the period of 1999–2020. This study employs the socioeconomic indicators—GDP per capita (current US\$) which is used to proxy economic growth. Life expectancy at birth, total (years), Mortality rate, infant (per 1,000 live births), Inflation, consumer prices (annual %), Energy use (kg of oil equivalent per capita), employment rate, and secondary school enrollment to investigate the impact of socioeconomic indicators on economic growth of Nigeria and South Africa. All the data used were sourced from the World Development Indicators (WDI), database, 2022. The logarithm form for all the data is used for both countries, except inflation. The study employs the econometric technique of Classical Ordinary Least Squares (OLS). This method is suitable because it allows a diagnostic test such as, heteroscedasticity, serial correlation, histogram-normal, stability to be carried out, and the linear growth model goodness of fit is ascertained as well.

Our linear growth model is written as follows:

$$GDPPC = \beta_0 + \beta_1LEB + \beta_2MRI + \beta_3SCH + \beta_4ENG + \beta_5EMP + \beta_6INF + \mu \dots \dots \dots (1)$$

where:

- *GDPPC* is the gross domestic product per capita proxy economic growth, and is the dependent variable
- *LEB* is the life expectancy at birth
- *MRI* represents the mortality rate, infant (per 1,000 live births)
- *SCH* is the secondary school enrollment
- *ENG* is the energy use (kg of oil equivalent per capita)
- *EMP* is the employment rate
- *INF* is the Inflation, consumer prices (annual %)
- $\beta_1 - \beta_6$ are the coefficients of the variables
- μ is the error term

Table 1. A priori expectations of the variables estimated in the study

Variables	Sign
<i>LEB</i>	+
<i>MRI</i>	–
<i>SCH</i>	+
<i>ENG</i>	+
<i>EMP</i>	+
<i>INF</i>	–

3.1. Empirical Results

From the results in Table 2, it can be deduced that in both Nigeria and South Africa, human capital development proxy by secondary school enrollment is positive and significant to determine an improvement in economic growth. Outcome shows that 1 percent increase in secondary school enrollment promotes economic growth by 0.90 and 1.57 percent in Nigeria and South Africa respectively. However, without formal education and training, human capital development in skills and innovations required for economic growth can as well be achieved through large spillover diffusion of knowledge in the manufacturing sector. This assertion is supported by the Pelinescu (2015).

As expected, the extent of mortality rate in Nigeria and South Africa shows a negative and significant impact on the economies of both countries. For instance, in the two countries, 1 percent increase in rate of mortality decreases economic growth by 5.15 percent and 3.5041

respectively. To reduce the negative impact of mortality rates, several measures and vaccines to treat polio and measles had been introduced by the World Health Organisation (WHO) especially in Africa to reduce infant death, yet this move has no positive impact on the economic growth of Nigeria and South Africa.

Result of the negative and significant life expectancy on economic growth in South Africa defers from our expectation because it is assumed that high life expectancy should promote economic growth, however, the reverse is the case in our result. This may be due to the low productivity of old people in South Africa. From the result, 1 percent increase in the life expectancy at birth reduces economic growth by 11.93 percent. The result of the decrease in economic growth as a result of rising life expectancy is in line with the previous work by Kunze (2014) and Hansen & Lønstrup, (2015).

Rising employment is expected to provide income for the people, and hence promote economic growth via saving and investment channels. From Table 2, in both Nigeria and South Africa, a positive and significant results revealed. This shows that 1 percent increase in the rate of employment will increase economic growth by 3.10 and 4.28 percent respectively. Our result is in line with the previous works by Fields (1988) and Sodipe & Ogunrinola (2011).

Finally, inflationary rates in Nigeria and South Africa revealed negative and significant results as expected. Although, this is not a general consensus but many scholars support that rising inflation reduces peoples' income, savings, and investment (Valdovinos, 2003; Pollin & Zhn, 2006; Tien, 2021), as a result decreases economic growth. With these results, 1 percent increase in the rates of inflation reduces economic growth by 0.02 and 0.04 percent in both countries accordingly.

Table 2: OLS results for Nigeria and South Africa

Dependent Variable: <i>GDPPC</i>	Nigeria		South Africa	
	Coefficients	Prob. Values	Coefficients	Prob. Values
Variables				
<i>LEB</i>	-3.3443	0.5631	-11.9372	0.0001**
<i>MRI</i>	-5.1519	0.0301**	-3.5041	0.0001**
<i>SCH</i>	0.9004	0.0063**	1.5700	0.0434**
<i>ENG</i>	-0.0058	0.9960	-1.2541	0.2846
<i>EMP</i>	3.1094	0.0336**	4.2869	0.0064**
<i>INF</i>	-0.0231	0.0091**	0.0442	0.0063**

Note: the asterisk values are probabilities values significant at 5 percent

3.2. Diagnostic check

According to the result in Table 3, the estimated OLS model shows that the data for the study is free from Heteroskedasticity and Serial Correlation. We also checked further by determining the normality and stability of the model. From Figure 1, 2 & 3, it can be shown that the data for the study were normally distributed for the two countries. More so, the model for the study is very stable. It can be concluded that overall the model is suitable for the study.

Table 3: Diagnostic tests results for Nigeria and South Africa

Test	Nigeria		South Africa	
	F-Stat.	P-Values	F-Stat.	P-Values
Heteroskedasticity Test: Breusch-Pagan Godfrey	0.4554	0.8302	0.9898	0.4664
Breusch-Pagan Godfrey Serial Correlation LM Test	0.6524	0.5370	1.6959	0.2216

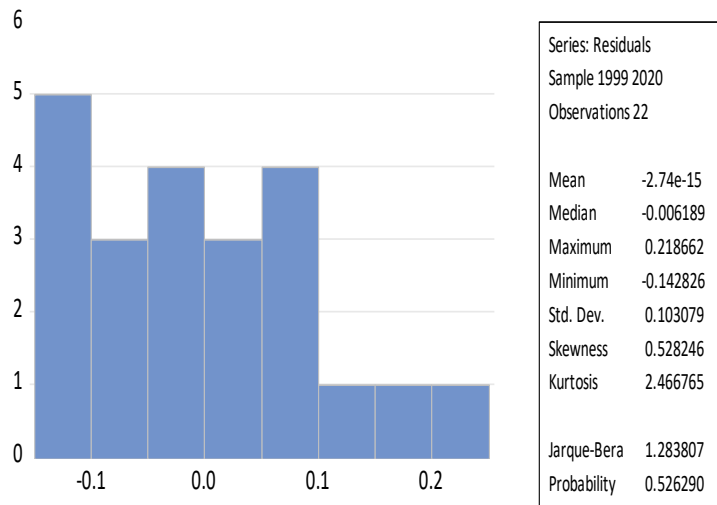


Figure 1a: Histogram-normal distribution test result for Nigeria

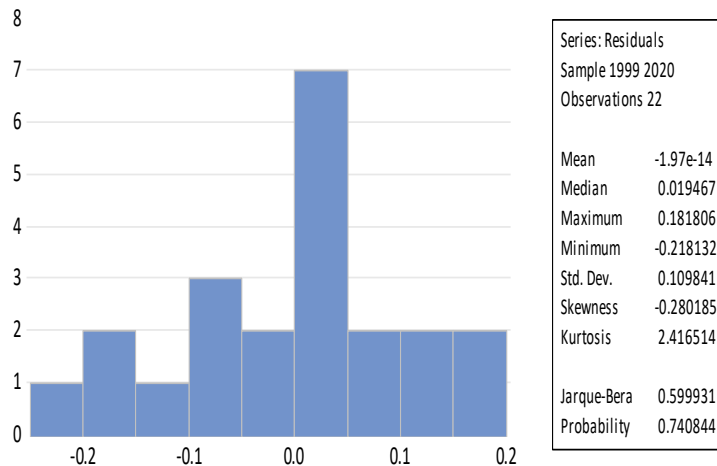


Figure 1b: Histogram-normal distribution test result for South Africa



Figure 2: Recursive estimates stability test for Nigeria



Figure 3: Recursive estimates stability test for South Africa

4. Conclusion and policy recommendations

The aim of this study is to examine the impact of socioeconomic factors on economic growth of Nigeria and South Africa. The previous studies mostly focused on the traditional macroeconomic variables that affect economic growth. However, there are scanty studies about the impact of socioeconomic factors on economic growth especially for Nigeria and South Africa. Therefore, the current study concentrates on the socioeconomic factors that impact Nigeria and South Africa to fill the gap in the literature. The empirical findings of this study affirmed positive and significant impacts of secondary school enrollment and employment creation on the economic growth of Nigeria and South Africa. The outcome of the study confirmed the hypothesis of Solow-swan growth model that human capital is an important factor in determining the growth of an economy.

Employment plays an important role in creating wealth for a nation through improvement in savings and investments that promote economic growth. The benefits of employment creation are numerous. Overall, it reduces poverty rates and promotes income of a nation. Employment with training can also contribute to more acquisition of skills and innovation, and all these promote economic growth. The government of Nigeria and South Africa should work closely with educational and employment agencies in creating viable strategies that improve education and employment generation. Since inflation is limiting the economic growth of both countries, efforts should be made by the government in formulating monetary policies that can drastically reduce the impact of inflation on economic growth. The study contributed to knowledge by drawn an inference from both social and economic variables that promote economic growth. While previous scholars concentrated mostly on the traditional economic variables that determine economic growth, this current study analyzed

the social variables in addition to the economic factors that determines growth in Nigeria and South Africa.

This study focuses only on Nigeria and South Africa. Future researchers may extend it to countries in Africa as an area of study. This implies that future study will focus on panel study rather than time series. Next, this study only considered the impact of socioeconomic variables on economic growth in the period of democratic regime especially for Nigeria. Other future researchers could compare the pre-and post-democratic periods of impacts of socioeconomic factors on economic growth.

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Bio-notes:

Olabode Eric Olabisi is a Senior Lecturer (Ph.D.) of Economics in the Department of Economics, Elizade University in Nigeria. He studies and teaches Economics, Economic Growth and Development, Econometrics and Advanced Statistics. In these areas, he has published many journal articles.

Usenobong James Effiong is a Staff of Elizade University in Nigeria. He is an Economist and Researcher in the field of Economics.