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ECONOMIC GROWTH, UNEMPLOYMENT AND HEALTH OUTCOMES IN NIGERIA

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ABSTRACT
The study investigated the relationship between economic growth, unemployment, and health outcomes in Nigeria. Using Autoregressive Distributed Lag (ARDL) technique, the study found that economic growth has negative and significant relationship with crude death, and have a positive and significant relationship with life expectancy. Unemployment, on the other hand, is significant positive predictor of only crude death, and not that of life expectancy at birth. Given these findings, federal and state government in Nigeria are encouraged to put policies that improve economic performance to increase health outcomes.

1. INTRODUCTION

Economic growth has pivotal role to play in shaping the health outcomes of every economy. A buoyant economy has enough resources to utilize in providing the necessary wherewithal needed in improving the health sector of a country. But when an economic is bankrupt and stagnant, it has negative impact on the overall health of citizenry. Several studies like Kanwanye and ogunbadejo (2021), Ogunbadejo and Aisha (2021); Bul and Moracha (2020); Weil (2014) have investigated the relationship between economic growth and health outcomes, while others like Brenner (2005). Stevens, Miller, Page and Filipski (2013); & Hoynes, Hillary, Miller, and Schaller (2012) have investigated the relationship between unemployment and economic growth.

The current study is therefore meant to uniquely contribute to the ongoing debate about the relationship between economic growth, unemployment, and health outcomes in Nigeria. Different from existing studies, the current studies used up-to-date data of the variables to investigate the relationship among them. Apart from the current section of paper, section two contains the literature review, section three contains methodology, section four contains presentation of results while section five contains conclusion and policy recommendation.

2. LITERATURE REVIEW

A wide range of studies have investigated the relationship between fiscal decentralisation and economic growth and overall performance of many countries. The most relevant to this study are reviewed hereafter. Kanwanye and ogunbadejo (2021) investigated the relationship between mortality rate and economic growth in Nigeria. Using unit roots test, cointegration and two-stage least squares (2SLS) estimation technique was adopted in the analysis. the study found significant positive relationships between crude birth rate and per-capita income, inverse relationship between literacy rate and crude birth rate. The study also found that literacy rate and total labour participation increased the per capita income in Nigeria.

Ogunbadejo and Aisha (2021) examined the interactions between health (body mass index), agricultural output, and economic growth in Nigeria. Using two stage Least Squares approach, the study found that the interactive variable (health and agricultural output) was positively associated with Nigerian economic growth. The study equally found that labour exert a significant positive impact on Nigerian economic growth.

Bul and Moracha (2020) investigated the effect of economic growth on health in Sub-Saharan Africa with data from 1991-2015. Using pooled OLS and two-ways fixed effect method, the study found that economic growth and health outcomes have a statistically strong negative significant relationship. The analysis showed that economic growth decreases infant mortality rates and fertility rate through the provision of healthcare services and improves life expectancy as well. In addition, other variables including agriculture, services, and population significantly affects health outcomes, while per capita income (GDPPC) unveils more effect on health in SSA.

Weil (2014) examined the relationship between health and economic growth developed and developing economies. The study found that, across and within countries, income per capita is highly correlated with health, as measured by life expectancy. The study concluded other factors that simultaneously raise income and improve health outcomes, such as institutional quality and human capital are responsible for a good deal of the observed health–income correlation. Based on the review, it was found that varying and consistent findings were discovered on the relationship between economic growth and health, it is in view of this that the current study, based on the nature of the stationarity of the variables, used ARDL Cointegration method to investigate the effect of economic growth, unemployment rate on health outcomes in Nigeria.

There is other strand of the literature who have investigated the relationship between unemployment and health outcomes. A leading work in this category was carried work by Brenner (2005). Using Engle-Granger Cointegration method and Shiller lag estimation approach, he found that the net effect of increased unemployment leads to a substantial increase in mortality, while increases in GDP per capita leads to a significant decrease in mortality rates during. Adofu and Salami (2018) investigated the effect of unemployment rates on mortality rates in Nigeria, using time series data. Using Johansen Cointegration Test and Fully Modified Least Square Regression, the study found that the second lag of unemployment rates have significant and positive effect on mortality rates. In addition, GDP per capita was found to have significant and negative effect on mortality rates. Stevens, Miller, Page and Filipski (2013); & Hoynes, Hillary, Miller, and Schaller (2012) also found statistical and significant relationship between unemployment and mortality rates.

3. METHODOLOGY

The study used secondary data sourced from Central Bank of Nigeria and World Bank Development Indicators. The data set for the variables covers the period of 1983 to 2024. Health Outcomes, the dependent variable, is proxied by crude death rate and life expectancy at birth, while growth rate of GDP, unemployment rate and Incidence of HIV are the independent variables. The implicit specification is presented in equation (1)

HEALTH = f(GRGDP, UNEMPL, HIV,)…………………………………………………(1)

Where HEALTH represents health outcomes (proxied by crude death rate [Model 1] and life expectancy [Model 2]), GRGDP represents growth rate of GDP, UNEMPL represents unemployment rate and HIV represents HIV prevalence rate. In other to estimate the long-run cointegrating relationship between the dependent and independent variables, Autoregressive Distributed Lag (ARDL) technique, by Pesaran et al, 2001, was used. The technique is adopted for this study because it is suitable for studies with short time span and models with mixture of order zero and order one integration levels. The ARDL specification of the model is shown in equation (2):

$$HEALTHP_t = \delta_0 + \delta_1 HEALTH_{t-i} + \delta_2 GRGDP_{t-i} + \delta_3 UNEMPL_{t-i} \ \sum_{t=1}^{a} \gamma_i HEALTH_{t-i} + \sum_{t=0}^{b} \psi_i \mathrm{GRGDP}_{t-i} + \sum_{t=0}^{c} \lambda_i HIV_{t-i} + U_t \ldots\ldots(2)$$

In equation (2), δ_0 represents the intercept; $\delta_1 - \delta_3$ shows the long run coefficients of the variables, terms with summation signs are used to model the short run dynamics structure; $\gamma_i, \psi_i, \lambda_i,$ = Short run multiplier of the variables, a - h = lag length for the short run dynamic structure; μ_t = error term and t = time. In the first step, equation is estimated to check the existence of long-run relationship among the variables. If the F-statistics of the bound test is greater than upper bound at 5% statistical significance, it implies that there is long-run relationship among the variables. The long-run estimates of the ARDL will be used to explain the relationship among the variables. Conversely, If the F-test of the bound test is less than upper bound at 5% statistical significance, it implies that there is no long-run relationship among the variables. The short-run estimates of the ARDL will be used to explain the relationship among the variables.

4. PRESENTATION OF RESULTS

4.1 Descriptive Statistics

Table 1: Descriptive Statistics of the Variables

	CRUDEDEATH	LIFEEXP	NGDP	UNEMPL	HIV
Mean	15.89409	49.25553	5.27E+13	14.65576	1.058636
Maximum	18.87000	52.91000	2.02E+14	34.00000	1.860000
Minimum	12.98900	45.48700	4.95E+11	1.800000	0.340000
Jarque-Bera	3.269930	3.415681	5.792779	1.955077	3.011631
Probability	0.194959	0.181257	0.055222	0.376236	0.221836
Observations	33	33	33	33	33

Source: Authors' Computation, 2024.

As shown in Table 1, the average growth rate of GDP is 5.27 billion naira, with a maximum value of 202 billion naira, and a minimum value of 4.95 billion naira. As for the unemployment rate, the table shows an average rate of 14.66, a minimum of 1.8 and a maximum of 34 per cent. As for HIV prevalence, an average of 1.06%, minimum of 0.34% and maximum of 1.86% were found. The table equally shows that both CRUDEDEATH, LIFEEXP, UNEMPL, NGDP and HIV are normally distributed because the probability of the Jargue-Bera probabilities is greater than the five per cent significance level, To be able to decide on the best cointegration method for the analysis, the unit root test conducted is presented in table 2.

4.2 Unit Root Test

Table 1 contains the results of stationarity test of the variables.

Table 2: Unit Root Tests

Variables	Level		First Difference		Order of Integration
	t-statistics	Critical values	t-statistics	Critical values	
CRUDE	-0.0210	-2.9571	-3.1302	-2.9604	1
LIFEEXP	-1.7462	-3.5578	-3.4364	-2.9604	1
GRGDP	-4.5772	-2.9604	-	-	0
UNEMPL	0.1202	-1.9533	-2.7942	-1.9533	1
HIV	-2.8592	-3.5578	-3.5689	-2.9604	1

Source: Authors' Computation

As shown in table 2, CRUDE, LIFEEXP, UNEMPL and HIV are integrated of order one. The critical values of the variables are greater than that of the t-statistics after the first differencing of the variables. Contrariwise, GRGDP is integrated of order zero, the critical values of the variables are greater than the t-statistics at zero level. This shows that the model has a mixture of I(1) and I(0) variables and does not have variables that are integrated of order 2. With these results, ARDL Bound Test by Peasan et al (2001) was applied to check for the presence of long-run cointegration. The result is presented in table 3.

4.3 ARDL Bound Test

Table 3: Bound Test Results

Models	5% Statistical Significance (Lower Bound)	5% Statistical Significance (Lower Bound)	F-statistics	Outcome
Model 1	2.79	3.67	16.0791	Cointegrated
Model 2	2.79	3.67	3.9807	Cointegrated

Source: Authors' Computation

As shown in table 3, the F-statistics of the two models is greater than the upper bound statistics of the bound tests. It can therefore be concluded that fiscal decentralisation and the economic performance are cointegrated in the long-run.

4.4 Long-run Relationship of the Models

Table 4 shows the long-run relationship among the variables.

Table 4: Long-run Relationship

Variables	Model 1	Model 2
GRNGDP	-0.0934 (0.0048)***	1.8959 (0.2647)***
UNEMPL	0.0025 (0.0010)**	-0.0454 (0.0557)
LOGHIV	0.0044 (0.0297)	-1.4786 (1.2722)
C	5.4782 (0.3752)***	9.6727 (14.8147)

Note: () contains the standard error while *, ** and *** represent 10%, 5% and 1% levels of statistical significance respectively**.**

As shown in Table 4, growth of GDP is negative and statistically significant related to crude death, negative and statistically significant in explaining the variation in life expectancy at birth. The result shows that one percent change in economic growth will lead to 0.0934% decrease in crude death at 5% statistical significance level, other factors held constant. Also, it was found that one percent change in economic growth will lead to 1.8959% increase in growth rate of life expectancy at birth at 5% statistical significance, other factors held constant. However, the table shows that unemployment rate is positively and statistically significant in influencing crude death. A one percent change in unemployment rate will lead to 0.003% increase in growth rate of life expectancy at birth at 5% statistical significance, other factors held constant.

Unemployment rate is not statistically significant in explaining variations in life expectancy at birth. Also, the control variable, HIV prevalence is not statistically significant in explaining variations in crude death and life expectancy. The finding in the study is similar that of Kanwanye and ogunbadejo (2021), Ogunbadejo and Aisha **(**2021); Bul and Moracha (2020) and Weil (2014). The significant relationship between unemployment and crude death is also in tandem with studies like Brenner (2005). Stevens, Miller, Page and Filipski (2013); & Hoynes, Hillary, Miller, and Schaller (2012) and Adofu and Salami (2018).

4.5 Post-estimation Tests

In other to ascertain the robustness and reliability of the models, post-estimation tests like normality test, serial and heteroscedasty tests were carried out. Their results are presented in table 5.

Table 5: Post-estimation Tests

	MODEL 1		**MODEL 2**	
Tests	**Statistics**	**Probability**	**Statistics**	**Probability**
Normality Test	0.5901	0.7445	1.3431	0.5109
Serial Correlation Breusc-Godfrey)	0.4388	0.6528	0.3001	0.7457
Heteroscedastic (Breusch-Pagan-Godfrey)	0.5721	0.8146	2.2672	0.0658
Stability Test (Ramsey Reset Test)	1.4297	0.2492	2.1467	0.1565

Source: Author's Computation, 2023

As shown in table 5, the probabilities of the three post-estimations tests are greater than t-statistics. It can therefore be concluded that the residuals of the models are normally distributed, and that they are free from heteroskedastic and serial correlation problems. The estimates are therefore stable and robust, and can be used for research purpose and policy recommendations.

5. CONCLUSION AND POLICY IMPLICATIONS.

The study investigated the relationship between economic growth, unemployment and health outcomes in Nigeria, using a time series data of 1983 to 2024. Using ARDL Cointegration method, the study found that economic growth and unemployment have a long run cointegrating relationship with health outcomes (proxied by crude death and life expectancy at birth). The study also found that economic growth is a significant predictor of crude death and life expectancy in Nigeria. However, unemployment is significant predictor of only crude death, and not that of life expectancy at birth. Given these findings, federal and state government in Nigeria are encouraged to put policies that improve economic performance to increase health outcomes.

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