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Unemployment, Health Outcome and Inclusive Growth in Nigeria: ARDL Bound Test Approach

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Abstract: The main objective of this study is to examine unemployment, health outcome and inclusive growth on Nigerian economy over the period 1990-2021. Extant literature only captured a part of the whole as they either concentrate on the relationship between unemployment and inclusive growth or health outcome on inclusive growth. Consequently, the tripartite relationship among these concepts seems missing in the body of literature. This study utilized the auto-regressive distributed lag (ARDL) Bound Test technique to examine the correlation and long run relationship among variables. The empirical findings indicated a long run relationship among inclusive growth, unemployment and health outcome. Also, unemployment and health outcome have a negative and significant relationship with inclusive growth in Nigeria within the study period. Based on the findings, the paper recommended the need for the government to develop plans and policies that will expand employment opportunities and also enhance inclusive growth through increased health expenditure that will instigate the desired health outcomes.

Keywords: Unemployment; Health Outcome; Inclusive Growth; ARDL; Nigeria

JEL Classification: O11

1. Introduction

Most industrialized nations have encouraged their growing populations to be more active, which boosts the growth of the economy. Developing countries, especially Nigeria, a lack of aggregate demand changes the growth path of the economy, underutilizes production factors, and causes domestic labour market unemployment.

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Unemployment is important to policymakers, economists, and researchers because it is a key macroeconomic indicator and determinant of economic growth.

However, Nigeria has seen jobless growth for almost two decades. Petroleum oil, whose price has been declining since 2015, has been the primary driver of this growth, but it creates fewer jobs and is less inclusive. According to the Inclusive Expansion Analytics Framework (World Bank, 2009), inclusive growth is defined as an absolute reduction in poverty associated with productive labour rather than direct income redistribution. Economic growth must be broad-based and include the majority of the workforce to be sustainable.

Nigeria's unemployment rate has been steadily increasing year after year, currently standing at 37.7% (National Bureau of Statistics, 2022). Unemployment has become a great concern in the lives of Nigerian youths, producing frustration, dejection, and reliance on family members and friends, who have their own set of challenges to deal with (Bello, 2022). Youth unemployment is also caused by low industrialization, economic growth, labour force quality, and the execution of the national labour policy (Oyewobi, 2019).

The high rate of youth unemployment in Nigeria has contributed to a high rate of terrible practises such as militancy, Boko Haram insurgency, drug trafficking, abduction, armed robbery, prostitution, smuggling, and general insecurity. Thus, stable and decent employment opportunities are essential to income and security (Akindare, 2020). Despite Nigeria's booming economy, unemployment is rising, per capita income is falling, inflation is rising, and other socio-economic issues are arising (Abdulsalam & Abdullahi, 2016).

Human capital remains important due to the impact of employment on economic growth. Economic growth does not ensure that all members of society benefit equally. Reduced health inequities and improved health conditions are critical to a country's economic growth. Health is crucial for inclusive growth since it reflects an individual's well-being and influences income and employment.

Altuntepe and Guner (2013) argued that society's health affects human capital development, which drives productivity and innovation. Three of the Sustainable Development Goals (SDGs) aim to ensure healthy lives and well-being for all at all ages by addressing all major health priorities, calling for more research and development, increased health financing, and strengthening all countries' health risk reduction and management capacity (SDGs; United Nations, 2015).

Poor health hinders economic growth, thus, the need for prioritizing health to enhance prosperity and improve health outcomes. Healthcare spending affects health outcomes, according to several development plans. Policymakers use health spending to influence the health sector to achieve their objectives. However,

empirical evidence has not entirely supported this approach because studies have generated mixed results.

The Nigerian government has attempted numerous strategies to reduce unemployment and improve health outcomes, but none have proved effective. Some of which are empowerment programs for youth and skilled workers, soft loans, graduate student agriculture loans, microfinance institutions, and funding for many nongovernmental organizations. The 2001 Abuja Declaration by Heads of States of the African Union called for spending at least 15 percent of yearly budgets on the health to enhance health outcomes; however, many nations have not met this goal (Akanni, 2012). Nonetheless, because of the unsettling environment, unemployment and poor health outcomes in Nigeria remain complicated and complex problems.

Nigerian health outcomes have not improved despite rising investments in healthcare. It should also be highlighted that private individuals finance a substantial percentage of Nigeria's health costs, which reduces individual incomes. With high unemployment, it may be difficult for people to save and invest for long-term benefits (Bloom and Canning, 2003). The Nigerian economy is heavily dependent on imports, including goods and services. Wealthy citizens and political officeholders import medical services by hiring foreign medical specialists to work in Nigeria or going overseas for medical examinations and treatment, enriching foreign countries at the expense of the Nigerian economy. Brain drain increases as trained medical personnel move to industrialized nations with superior medical technologies to maximize production and keep up with medical innovation. Thus, health sector employment decreases, lowering GDP and economic growth.

Despite GDP growth, emerging nations like Nigeria still face low living standards, a high unemployment rate, and health inequalities, thus the rationale for inclusive growth (James, *et al.*, 2017). Inclusive growth requires employment, productivity, human capability development, social safety nets, and targeted intervention. High economic growth is predicted to overcome the problem of rising population expansion, while employment is expected to reduce poverty. According to Jim (2013), countries require robust, inclusive economic growth to alleviate poverty and enhance shared wealth. To grow, they must invest in health, security and education for their residents to build human capital.

In 2022, the unemployment rate was 37.7% (National Bureau of Statistics). This suggests that economic growth has not been able to properly handle the increase in population growth, the labour force, and employment opportunities. Also, in comparison with health expenditure per capita growth, health status improvement is poor. For example, infant and under-five mortality rates declined from 86.52 to 64.88 and 140.82 to 99.56 per 1,000 live births, respectively, while life expectancy at birth rose slightly from 51 to 55 years (World Bank, 2022).

However, economic literature has experimentally studied the relationship between economic growth and unemployment based on Okun's law, which shows that GDP growth and employment rate change inversely. Because of the country's high growth rate and high unemployment rate, the scenario of low- and middle-income countries like Nigeria does not support Okun's law. Nigeria's relatively high rate of economic growth is due to the country's reliance on oil exports, which did not reduce unemployment. As a result, it is not inversely related to economic growth (Arewa & Nwakanma, 2012; Akeju & Olanipekun, 2015). Thus, it is imperative to check the validity of Okun's law in the context of Nigeria.

2. Literature Review

The relationship between economic growth and unemployment has been studied in the economic literature based on the Okun (1962) which shows the existence of an inverse relationship between the changes in unemployment rate and growth rate. The study found that if unemployment decreases by 1%, RGDP will increase by 3% and vice versa.

In recent years, several studies like Ionides, *et al.,* (2013) which investigated the relationship between unemployment and mortality rates in United States and Hjazeen, *et al.,* (2021) which utilized the ARDL model to examine the impact of unemployment on Jordan's economy opined the findings of Okun (1962).

On the contrary, the study of Martins and Abubakar (2020) found that economic growth was found neither to have raised the level of employment nor reduced poverty in Nigeria.

However, Soleh and Suwarni (2020) analyzed inclusive growth using a workforce approach in the provinces of Java, Indonesia from 2001 to 2019 and found that the economic growth of provinces in Java was not yet inclusive.

Reviewing the empirical evidence of health outcomes and economic growth, Kim and Lane (2013) in their study among developed countries found a negative relationship between government health expenditure and health outcomes (infant mortality rate). Likewise, Ionides, *et. al.* (2013) which found that an increase in the unemployment rate is associated with a decrease in the overall mortality rate.

Similarly, Becchetti, *et al.,* (2015) in their study on a large sample of Europeans aged above 50 using individual and regional-level data found that health expenditure to GDP and health expenditure per capita have a negative and significant impact on health outcomes (changes in the number of chronic diseases). In another study conducted on Nigeria utilizing the VECM estimation technique, Matthew, Adegboye & Fasina, (2015) found that public spending on health has a significant relationship with health outcomes in Nigeria and that environmental factors such as carbon

dioxide emissions affects individuals' health. Similarly, Nwanosike, *et al.*, (2015) employed the OLS technique while Maduka, *et al.*, (2016) utilized the Toda and Yamamoto causality approach and found that increase in health expenditure indirectly influence health outcomes in Nigeria.

Utilizing the ARDL Bound test approach, Ogunjinmi and Adebayo (2019) found that that health expenditure and economic growth play key roles in determining the health outcomes in Nigeria.

However, Afolabi (2021) employed the Fixed Effect OLS to examine the relationship between health and the main indicators of inclusive growth among 37 OECD member countries using panel data from 1985 to 2019 and found that life expectancy has a statistically significant positive impact on GDP per capita, a non-statistically significant positive impact on employment to population ratio and inequality, and a non-statistically significant negative impact on poverty.

Based on prior findings, literature on the impact of unemployment and health outcomes on inclusive growth is scarce, especially in Nigeria. This paper fills this gap and contributes to empirical literature on unemployment and health outcomes on inclusive growth in Nigeria from 1990 to 2021.

3. Methodology

Arthur Okun (1962) found that unemployment inversely affects potential output in the US economy. The theoretical foundation of the relationships Okun investigated is based on the assumption that having more employees demands the creation of more goods and services. Okun found that when real growth was high, unemployment rate declined, and when it was low or negative, it increased.

This study aims to examine Nigeria's unemployment, health outcomes, and inclusive growth from 1990 to 2021 and data was taken from the World Bank Database, which has the longest possible time series data on all variables. In OKUN's model, we incorporated several control variables such as unemployment, infant mortality, gross capital formation, and the Human Development Index (HDI). Hjazeen *et al.* (2021) Jeke and Wanjuu (2021); Ogunjinmi and Adebayo (2019); Kim and Lane (2013); Yaqub *et al.* (2012)

The following variables are used in the study, and their meanings are based on World Bank definitions:

Unemployment (UM) is described as the scarcity of job opportunities in proportion to their availability, as well as the ongoing search for them. Unemployment rate = number of unemployed people divided by labour force.

The infant mortality rate (IM) is the number of newborns who die before reaching the age of one year in a given year for every 1000 live births. The under-5 mortality rate (per 1,000 live births) is used as a proxy in this study.

Gross capital formation (GCF) is the acquisition of assets and the production of such assets for their own use. It represents the net increase in tangible assets like as land, equipment, and so on during the course of the measurement period. Gross fixed capital formation (as a percentage of GDP) serves as a proxy.

The Human Development Index (HDI) is a statistic designed by the United Nations to analyze inclusive growth that takes into account social and economic development. It provides a composite measure of three dimensions of human development: living a long and healthy life (as measured by life expectancy), being educated (as measured by adult literacy and enrollment in primary, secondary, and tertiary education), and having a decent standard of living (as measured by purchasing power parity, PPP, and income).

The model for estimation is specified in linear form as:

$$HDI_t = \beta_0 + \beta_1 UM_t + \beta_2 IM_t + \beta_3 GCF_t + U_t \quad (1)$$

Where HDI_t is the human development index at year t, UM_t is the rate of unemployment at year t, IM_t is the infant mortality rate at year t, GCF_t shows the stock of capital formation at year t and U_t is the error term.

The descriptive statistics for the study variables are shown in Table 1. The result shows that IM has the highest standard deviation, indicating that it fluctuates more than other variables. Furthermore, as represented by the mean, IM has the highest central tendency. However, UM is skewed to the right, whereas the other variables are skewed to the left.

Table 1. Descriptive Statistics

	HDI	**UM**	**IM**	**GCF**
Mean	0.465531	4.848125	95.33947	3.259850
Median	0.464500	4.010000	96.64300	3.266370
Maximum	0.540000	9.790000	125.8700	3.972595
Minimum	0.351000	3.700000	57.70100	2.651037
Std. Dev.	0.047299	1.909753	23.64257	0.415587
Skewness	-0.055004	1.732211	-0.148762	-0.061664
Kurtosis	2.683707	4.279434	1.589160	1.719123

Source: Author's Computation

4. Results and Discussion

The first stage in the analysis is to use the Augmented Dickey-Fuller (ADF) unit root tests to examine the time series properties of the data. This test is used in each series' level, first difference, and second difference by incorporating the constant (C) term, as well as both the constant and trend terms in the test equations.

Table 2 displays the results of the ADF unit root test for each time series at the level and first difference. The null hypothesis $Ho: \sigma = 0$ indicates that the variable is non-stationary, while the alternate hypothesis $H1: \sigma = 0$ means that the variable is stationary.

Table 2. Unit Root Test

Variable	Level	First Difference	
HDI	0.00131**		I(0)
UM	0.9980	0.0013*	I(1)
IM	0.5905	0.0251**	I(1)
GCF	0.3855	0.0139**	I(1)

Note (*) and (**) indicate 1% and 5% significance level respectively
Source: Author's Computation

The ADF unit root test of HDI indicated that the variable is stationary at level with inferences drawn at 5% significance level. The ADF unit root test for the other variables (UM, IM, GCF) revealed that they are non-stationary in level but stationary at first difference. As a result, we can deduce that the variables are of order I (0) and I (1). However, because all series are linked in various orders, there is a possibility that the variables have a cointegrating relationship. The ARDL bound testing approach was utilized to determine this.

According to Peseran, *et al.,* (2001), this technique has significant advantages over other estimating strategies. First, it allows for variables with different orders of cointegration, such as I(0), I(1), or a mixture. Second, the model can estimate both long-run and short-run estimates simultaneously. The ARDL model has a dependent variable of order p and independent variables of order q. The right-hand side of the model contains the lags of both the dependent and independent variables.

It is typically presented as follows:

$$y_{it} = \sum_{j=1}^{m} \alpha_{ij}\, y_{it-j} + \sum_{j=0}^{n} \beta_{ij}\, x_{it-j} + u_i + \varepsilon_{it} \quad (2)$$

Where i = 1,2,3…….. N, t indicates time, t = 1,2,…….T, j is the number of lags

For our estimation, Eq. (2) becomes

$$HDI_{it} = \beta_{i0} + \varphi HDI_{it-1} + \beta_1 UM_{it-1} + \beta_2 IM_{it-1} + \beta_3 GCF_{it-1} + \sum_{j=1}^{m-1} \alpha_{ij} \triangle HDI_{it-j} + \sum_{j=0}^{n-1} \beta^2{}_{ij} \triangle UM_{it-j} + \sum_{j=0}^{n-1} \beta^3{}_{ij} \triangle IM_{it-j} + \sum_{j=0}^{n-1} \beta^4{}_{ij} \triangle GCF_{it-j} + u_i + \varepsilon_{it} \quad (3)$$

The variables with the differences are the short-run variables while those without the difference are the long-run.

Table 3. ARDL Bound Test

F- Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	**Value**	**Significance**	**I(0)**	**I(1)**
F-Statistics	4.451242	10%	2.97	3.74
K	3	5%	3.38	4.23
		2.5%	3.8	4.68
		1%	4.3	5.23

Source: Author's Computation

Table 3 depict that the value of F-Statistics (4.451242) is greater than the upper bound value (4.23) at 5% significance level. This confirms that the overall model exhibited a long run relationship. Hence, we proceed to estimating the long run results of our model.

Table 4. ARDL Long Run Regression

Dependent Variable: HDI			
Variable	**Coefficient**	**t-statistic**	**Prob**
UM	-0.030281	-3.586671	0.0071
IM	-0.008147	-3.548419	0.0075
GCF	0.240172	5.370774	0.0007
C	-0.008499	-1.487012	0.1753

EC = HDI - (-0.0303*UM -0.0081*IM + 0.2402*GCF -0.0085*)

Source: Author's Computation

Table 4 shows the ARDL long run regression. The impact of unemployment (UM) and health outcomes (IM) have a negative and significant relationship with inclusive growth in Nigeria within the study period, while Gross capital formation (GCF) exhibit a positive and significant relationship with inferences drawn at 1% significance level. Thus, an increase in unemployment rate by 1% will decrease inclusive growth by 3%. This result is compatible with economic theory (Okun's law) which claimed that there exist an indirect linkage between economic growth and unemployment. Also, an increase in infant mortality rate by 1% will decrease inclusive growth by 0.8%. This could be due to the fact that infant mortality reduces the number of potential labour force, reduces savings as well as the working hours of victim parents. However, the effect of gross capital formation (GCF) on inclusive

growth is positive and significant at 1% significant level. Thus, an increase in GCF of 1% will bring about an increase in inclusive growth by 24%. Gross capital formation is an important contributor of inclusive growth because the higher the capital formation, the faster an economy can grow. Our findings confirm this positive relationship.

Finally, we accounted for the diagnostic test to assess the model's reliability and stability. The likelihood value of the Jarque-Bera statistics is 69%, according to Table 5, and we cannot reject the null hypothesis. This indicates that residuals follow a normal distribution. According to the Breusch-Godfrey LM test (P-Value = 33%), there is no serial correlation in the model, and the coefficients are efficiently estimated. The Breush-Pegan-Godgrey test result shows homoscedasticity (P-Value = 38%), implying that the standard errors and coefficient estimations are more robust and efficient. The Ramsey reset test has a probability value greater than 10%, implying that we cannot reject the null hypothesis. We conclude that the methodology and model have been properly specified.

Table 5. Diagnostic Tests

Test	**Null Hypothesis**	**Value**	***P*-Value**
Jaque-Bera	Normally distributed residuals	0.7312	0.6938
Breusch-Godfrey LM	No serial correlation	0.783	0.3343
Breusch–Pagan-Godfrey	Homoscedasticity	1.264	0.3831
Ramsey RESET	Stable structure	0.343	0.7410

Source: Author's Computation

5. Conclusion and Recommendations

Based on the findings on the validity of Okun's law on whether growth has a contributory effect in decreasing the unemployment rate in the economy, the study concluded that there exist a long-run relationship among inclusive growth, unemployment rate and health outcomes in Nigeria. This implies that inclusive growth can be used as an important instrument in decreasing and achieving the desired rate of employment and improved health outcomes. Many countries try to develop plans and policies that will expand employment opportunities and reduce the existing rate of unemployment. Thus, the paper recommends that the Nigerian government should focus on the creation of a conducive environment for the private sectors to create more job opportunities. Also, the government should enhance inclusive growth through increased health expenditure that will instigate the desired health outcomes.

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