Effect of Unemployment on Nigeria's Economic Development

Kolawole A. Bello
A Paper presented as part of the requirements for the Degree of
Doctor of Philosophy, Finance
Ligs University, Hawaii, USA

Annotation
Economic development, which has continued to be on the front burner of challenges facing the global economy, is measured through aggregate economic output per capita. This measurement parameter of economic development gives the impression that individual contribution to national productivity is a factor that determines the development status of countries. Many studies have found that unemployment has no relationship with economic development. Meanwhile, many other studies have confirmed Okun's law of 1962 that unemployment inhibits economic output. This study examines the relationship between unemployment and economic development in Nigeria's context and found a significant inverse relationship between the variables. It recommends that policymakers pursue creating jobs and reducing unemployment as an economic development strategy.
Keywords:*Chi-Square,Economic Development, Economic Growth, Lower-Middle-Income, Low-Income, Millennium Development Goals, Sustainable Development Goals, Unemployment.*

I.   Introduction and Objective

Like every good and service, there isa supply and demand side to labor in every economy.Unemployment occurs when the supply of labor is more than its demand.It is when active individuals within the age that qualifies to work and earn income do not work because they cannot find a job.The unemployed are people of the labor age who are without work, are available for work, and have taken specific steps to find work.The uniform application of this definition results in estimates of more internationally comparable unemployment rates as opposed tocalculations based on national definitions of unemployment.This performance indicator calculatesthe number of unemployed people as a percentage of the labor force.The labor force is the total number of unemployed people plus those employed("Unemployment - Harmonised unemployment rate (HUR) - OECD Data," 2022).

Economic development involves improving people'swell-being and standard of living.The productivity index divided by the population size usually determinesthe economic development level of nations, adjudging countries with relatively higher output per capita more developed.The parameters for measuring economic development include Gross Domestic Product per capita and Gross National Income per capita.Governments focus on economic development instead of growth because economic growth merely measures an increase in national productivity.In contrast,economic development considers productivity per capita, reflecting that growth in output and income needs totranslateinto higher productivity per person.Economic development often results in better human development indicators and standard of living. In contrast, economic growth may not always lead to such improvement in economic well-being as observed in Nigeria in recent years.

Since economic development has to do with average economic productivity, it stands to reason that the unemployment rate can influence nations' economic development levels, as proposed by Okun (1962) and Phillips Curve Theory (1958).However, a scientific study of the relationship between the two variables is a worthy endeavor to confirm or refute the hypothesis that the unemployment rate affects national development, especially with recent studies' disharmony on the theory.

Nigeria is the sixth largest country by population and the most populous nation of black people earth-wide as of 2022 ("2022 World Population by Country", 2022). In addition to its large population that should enhance production, the country has a large deposit of natural resources, including crude oil, natural gas, tin, iron ore, coal, limestone, niobium, lead, zinc, and arable land ("OPEC: Nigeria," 2022). Despite the country's endowment in human and natural resources that should ideally put it among the most developed countries of the world due to comparative advantage in many areas, it has remained in the bottom half of lower-middle-income countries (GDP per capita of $2,085 in 2021). Its unemployment rate has been rising steadily since 2016. The

ratio remained above the global average of 5.4% in 2019 when it recorded about 10.7% unemployment rate, almost twice the world average("ILOSTAT data tools to find and download labor statistics," 2022).This scenario leads to whether there is a connection between Nigeria'sunemployment and economic growth rates.

Statement of Problem

Like Nigeria, many underdeveloped countries have struggled with implementing blueprints to ensure the economic development of their nations without achieving desired outcomes.The global community'sdesire for the economic development of underdeveloped nations is apparent as the United Nations continues to seek the buy-in of countries to its international development plans, such as the erstwhile Millennium Development Goals (MDGs) and the Sustainable Development Goals (SDGs). Despite that underdevelopment has been theglobal community's concern in recent decades, the world'slow-income and lower-middle-income countries have not progressed much. The continued poor living conditions of people in underdeveloped nations often make them seek opportunities to experience better lives in more developed countries, thereby putting pressure on these economies they immigrate.

It is worthy of note that measures of economic development such as the Gross Domestic Products per capita and the Gross National Products per capita account for an individual's contribution to economic output. Moreover, Sustainable Development Goals 2 and 8 relate sustainable consumption, production,and decent work to economic growth ("WDI – Economy," 2022).Therefore, nations such as Nigeria must knowhow toeffectively surmount the challenge of developing their national economies and contribute more positively to the global economy. Hence, the need to test how unemployment affects economic development using Nigeria as a case study.

Research Question

This paper seeks to answer the following question:
1.   Is there a relationship between unemployment and the economic development of Nigeria?
2.   What is the relationship between unemployment and economic development in Nigeria?
3.   Does the unemployment rate affect the economic development of Nigeria?

Hypotheses

This study tests the following hypotheses to answer its research questions:
1.   H0: There is no relationship between unemployment and the economic development of Nigeria.
H1: There is a relationship between unemployment and the economic development of Nigeria.
2.   H0: The unemployment rate of Nigeria does not affect its economic development.
H1: The unemployment rate of Nigeria affects itseconomic development.

II.   Research Methodology

This study uses the Chi-Square (X^2) statistical technique to determine whether a relationship exists between unemployment and economic development levels inNigeria.The study employsthis statisticalresearch methodto suit the data under consideration. The variables (unemployment and economic growth rates) are categorical after rounding them up to the nearest whole number.

Scope of the Study

Thestudy employs Nigeria's unemployment and economic growth ratesas independent and dependent variables. It examines the relationship (if any) between unemployment and the country's economic growth rate between 2010 and 2019. The ten years study period avoids the impact of the Coronavirus pandemic that started in 2020 on the study's outcome.

Literature Review

Unemployment is essentially unused productive capacity that could have contributed to economic output, and the unemployed population reduces per capita productivity, which is the primary indicator of economic development. As a result, manyacademic studies have confirmed the relationship between unemployment and the economic development of countries because of the perception that employment and the labor force drive economic output.

Theoretical Literature Review

In a bid to provide statistical proof that the unemployment rate affects the extent of economic development, the renowned economist Arthur Melvin Okun came up with a theory that reveals how much economic output is foregone when the unemployment rate is higher than its natural rate. Okun's law suggests that a unit increase in

cyclical unemployment is associated with two percentage points of negative growth in real GDP, depending on the country and the period.Okun's law holds that employment correlates positivelywith economic growth, and unemployment negatively correlates with economic growth. According to Okun's principle, a 1% reduction in the unemployment rate in a year will result in a 2% increase in real GDP growth per year. It follows that there will usually be twice the GDP growth rate of employment growth rate according to Okun's law(Okun, 1962 as cited by Jeke & Wanjuu, 2021).

Another theory in the nexus between unemployment and economic development is the Phillips curve, which statesa consistent inverse relationship between unemployment and inflation. A. W. Phillips explained that economic growth occurs along with inflation, which should reduce unemployment. The theory posits that increasing government expenditure results in demand for labor, which leads to reduced unemployment. Consequently, the reduced number of unemployed raises wages to attract workers who have higher bargaining power for increased wages. The higher wage cost increases the prices of goods and services.

It is noteworthy that these theories propose that there is an inverse relationship between unemployment and economic development rates.

Empirical Literature Review
Many recent studies have examined the relationship between unemployment and economic growth and development.Saungweme et al. (2019), Mitchell & Pearce (2010), Prachowny (1993),Villaverde&Maza (2009), Michael et al. (2016), and Banda (2016) concluded that Okun's law, which states that unemployment and economic growth have negative correlation holds. Other papers that agree similarly are Biyase& Bonga-Bonga (2010), Al-Eid &Bahadi (2012), Freeman (2001), Al-Ghannam (2003), Al-Habees&Rumman (2012), Zagler (2006), Oye&Inuwa (2011), Ritsakis&Stamatiou (2016), and Yousefat (2011). Theyfound varying degrees of the presence of Okun's law that there is an inverse relationship between unemployment and economic growth in their studies (Conteh, 2021). While some observe a pattern of inverse relationship close to the one described by Okun's theory between unemployment and economic growth, others found a very minimal association between the variables.

A few studies invalidatedOkun's theory on the relationship between unemployment and economic growth. While some of those in this category concluded that there is no association whatsoever between the variables, others found that economic growth creates employment as opposed to the reverse direction suggested by Okun (1962). Sahoo & Sahoo (2019), Knotek (2007),Kreishan (2011), Keller & Nabil (2002), Juda &Esa (2010), and Irfan et al. (2010)found Okun's law unreliable and inconsistent in their studies as they concluded that unemployment rate is insensitive to growth in economic output.However, the details of each study's findings vary from the case studies and depend on the length of time they considered.Notably, there is no consensus onthe relationship between unemployment and economic growth (Conteh, 2021).

Specifically, Akeju&Olanipekun (2015) found that Okun's law is invalid in Nigeria's case as it discovered a high growth rate accompanied bya high unemployment rate. The study ascribed Nigeria'srelatively high growth rate to dependence on oil export, which did not reduce unemployment. Arewa&Nwakanma (2012) held a similar view that the unemployment rate is not inversely correlated with economic growth, concluding that Okun's law does not hold in low and middle-income countries (Akeju&Olanipekun, 2015).

Makaringe&Khobai (2018) and Temitope (2013) showed the extent of disparity in the findings of studies on the variables as they tested the relationship between unemployment and economic development in the same country around the same period and found different results. Makaringe and Khobai (2018) examined the relationship between the variables in South Africa between 1994 and 2016 using a regression model and observed that unemployment retards economic development. On the other hand, Temitope (2013) studied the relationship between the variables in South Africa between 2000 and 2012 and concluded that employment does not cause economic growth. Instead, GDPreducesunemployment (Jeke and Wanjuu, 2021).

The lack of consensus on the subject provides the impetus for this study to provide an independent assessment of the unemployment-economic development nexus.

Sample
The study's sampledata is Nigeria's unemployment and economic growth rates between 2010 and 2019. While this paper strives to provide insight into the relationship between the variables in recent times, it carefully avoids the years that were affected by the impact of the coronavirus pandemic.

Data Presentation

This study employs the Industrial Labor Organization (ILO) modeled unemployment rate estimate of Nigeria as the independent variable and the country'sGDP per capita growth rate as the dependent variable. Thevariables' indicators between 2010 and 2019 arein the table below:

Year	Unemployment Rate	GDP Growth Rate
2010	3.78	8.01
2011	3.77	5.31
2012	3.74	4.23
2013	3.70	6.67
2014	4.56	6.31
2015	4.31	2.65
2016	7.06	-1.62
2017	8.39	0.81
2018	8.46	1.92
2019	8.53	2.21

Source -Adapted from World Development Indicators on July 30, 2022

The table below shows the rounded-up values of the variables to the nearest whole number to assure test methodology suitability:

Year	Unemployment Rate	GDP Growth Rate
2010	4	8
2011	4	5
2012	4	4
2013	4	7
2014	5	6
2015	4	3
2016	7	-2
2017	8	1
2018	9	2
2019	9	2

Source – Adapted from World Development Indicators on July 30, 2022

Scatter Plot and Line of Best Fit

The graph below shows the scatter plot and line of best fit of the annual unemployment rate of Nigeria as the independent variable and itsannual GDP growth rate as the dependent variable from 2010 to 2019.
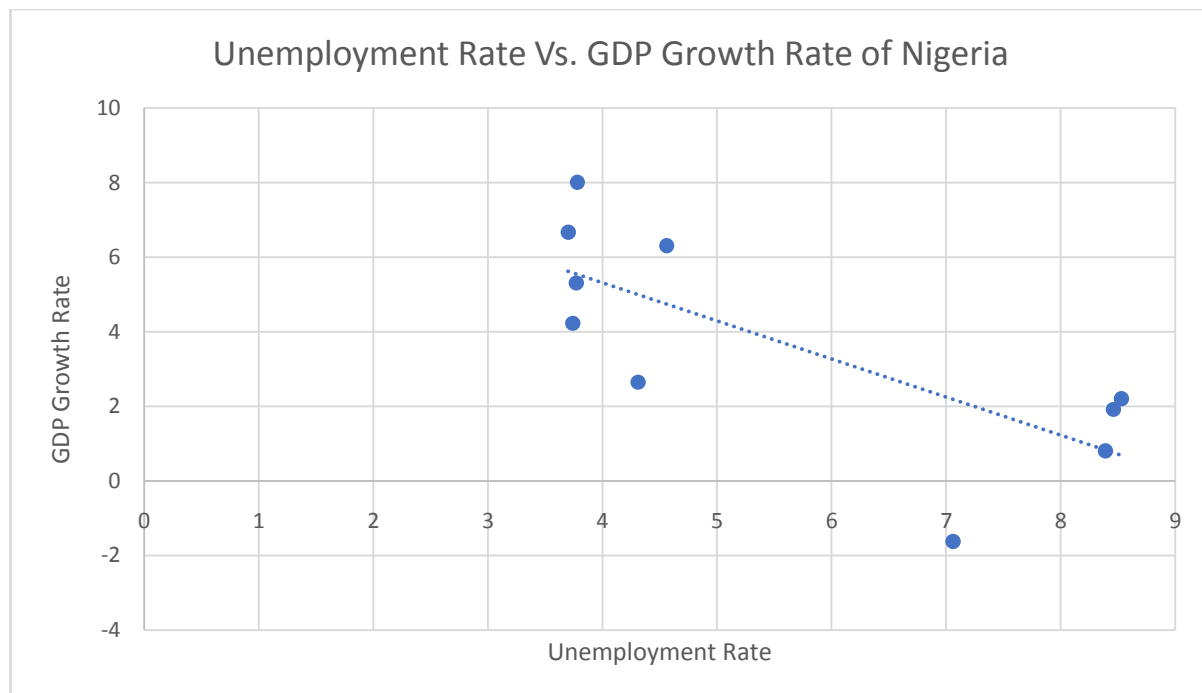
The linear line of best fit gives an initial impression that there is a minimal inverse or negative correlation between the unemployment rates and the GDP growth rates of Nigeria during the period studied. However, the study now performs a statistical analysis to confirm this perceived relationship.

Data Analysis
The studyemploys theChi-Square (X^2) to test the relationship between the variables statistically.

$$X^2 = \frac{\sum(O1-E1)}{E1}$$

Where:

O   =   Observed frequency

E   =   Expected frequency

$\sum$ =   Summation

X^2 =   Chi-Square Value

The Expected frequency is arrived at by first deriving the column and row totals of the data as follows:

Year	Unemployment Rate	GDP Growth Rate	Total
2010	4	8	12
2011	4	5	9
2012	4	4	8
2013	4	7	11
2014	5	6	11
2015	4	3	7
2016	7	-2	5
2017	8	1	9
2018	9	2	11
2019	9	2	11
Total	**58**	**36**	**94**

The Expected outcome table is presented in the table below:

Year	Unemployment Expected Outcome	Economic Growth RateExpected Outcome
2010	7.404255	4.595745
2011	5.553191	3.446809
2012	4.93617	3.06383
2013	6.787234	4.212766
2014	6.787234	4.212766
2015	4.319149	2.680851
2016	3.085106	1.914894
2017	5.553191	3.446809
2018	6.787234	4.212766
2019	6.787234	4.212766

Chi Square (X^2) Value=29.4096
The data's degree of freedom (*df*) is (Number of Columns – 1)(Number of Rows – 1) = 9
At 9 degrees of freedom, the following are the critical values of Chi-Square:

Probability	10%	5%	2.5%	2.0%	1.0%	0.5%	0.2%	0.1%
Critical Value	14.684	16.919	19.023	19.679	21.666	23.589	26.056	27.877

At 0.1%, 0.2%, 0.5%, 1.0%, 2.0%, 2.5%, 5%, and 10% probability levels, which translate to between 90% and 99.99% confidence levels, the calculated Chi-Square value is greater than the critical Chi-Square values, indicating that the results are significant. The result shows a negative relationship between unemployment and the economic development of Nigeria between 2010 and 2019. It answers all the research questions in the affirmative, accepts the alternative hypotheses, and rejects their null forms.

III. Findings and Discussion

The study examined the relationship between unemployment and the economic development of Nigeria by performing the Chi-Square test on the annual unemployment rate as the independent variable and the economic growth rate as the dependent variable of the country between 2010 and 2019. The scattered diagram and linear line of best fit of the data indicated an inverse relationship between unemployment and economic growth rates of the country. The Chi-Square statistical toolconfirmed a significant inverse relationship between the variables at between 90% and 99.9% confidence level, indicating that the probability of the result arising from chance is less than 0.1%.

Notably, the study outcome validates Okun's law,which proposes an inverse relationship between unemployment and economic growth, such that the lower the unemployment rate, the higher the economic growth rate, and vice versa. However, it did not establish the proportionate impactofareduction in the unemployment rate on the economic growth of Okun's law. The result equally validates the theoretical basis of the Philips curve.

Likewise, the paper agrees with Akeju&Olanipekun (2014), which found both short and long-run reverse relationships between the unemployment rate and output growth in Nigeria. Similarly, it harmonizes with Sodipe&Oluwatobi (2012),which established a statistical relationship between unemployment and economic developmentas proposed by Okun's law (An et al., n.d.). However, it is noteworthy that this result disagrees with somepreviousstudies such as Bankole &Fatai (2013), Babalola et al. (2013), Akeju&Olanipekun (2015), and Arewa&Nwakama (2012) that examined Okun's law in Nigeria's context and invalidated it.

On a broader spectrum beyond Nigeria, the study agrees with Freeman (2001),which concluded that Okun's law which estimated three points for each one percent reduction in the unemployment rate, has reduced to below two points but is still capable of proving estimates of the effects of unemployment on GDP. Similarly, it validates Geidenhuys&Marinkov(2007), which confirmed the presence of Okun's law relationship in South Africa. On the other hand, it invalidates Sahoo & Sahoo (2019), Knotek (2007), Kreishan (2011), Keller & Nabil (2002), Juda and Esa (2010), and Irfan et al. (2010).

IV. Conclusion

This paper confirmed an inverse relationship between unemployment and economic growth rates, which means that the higher the unemployment rate, the lower the economic growth rate and vice versa. While this is consistent with the direction of the relationship between unemployment and economic growth of Okun's law, the study did not examine the proportionate effect of a percentage reduction in the unemployment rate on economic growth that Okun's law found in the United States of America's economy.

Policy Recommendations

The findings of this study havesignificant policy implications for Nigeria and other low-income and lower-middle-income countries that have struggled unsuccessfully to develop their economies amidst relatively high unemployment rates. Since it is evident that economic output grows in tandem with a reduction in the unemployment rate, the government should aim to reducethe unemployment rate by encouraging local and foreign direct investments that create employment to achieve economic development. This recommendation is in harmony with Akeju&Olanipekun (2014),which recommends that policymakers pursue fiscal measures that attract foreign direct investments to reduce unemployment in Nigeria.

References

[1]. Akeju, K., & Olanipekun, D. (2015). *Unemployment and Economic Growth in Nigeria* [Ebook] (11th ed., p. 96). International Journal of African and Asian Studies. Retrieved 4 August 2022, from https://core.ac.uk/download/pdf/234689915.pdf.

[2]. An, Z., Ghazi, T., & Prieto, N. *Okun's Law: Unfit for Low and Lower Middle-Income Countries?* [Ebook]. International Monetary Fund. Retrieved 4 August 2022, from https://www.imf.org/external/np/seminars/eng/2016/GlobalLaborMarkets/pdf/Ghazi_Session1_paper.pdf.

[3]. Conteh, K. (2021). *Economic Growth and Unemployment: An Empirical Assessment of Okun's Law in the Case of Liberia* [Ebook] (pp. 3-7). Elsevier. Retrieved July 31, 2022, from https://papers.ssrn.com.

[4]. *ILOSTAT data tools to find and download labor statistics*. ILOSTAT. (2022). Retrieved 5 August 2022, from https://ilostat.ilo.org/data/#.

[5]. Jeke, L., & Wanjuu, L. (2021). *The economic impact of unemployment and inflation on output growth in South Africa* [Ebook] (13th ed., pp. 118-120). Academic Journals. Retrieved July 30, 2022, from https://academicjournals.org/journal/JEIF/article-full-text-pdf/868A8F867220.

[6]. Makaringe, S., & Khobai, H. (2018). *The effect of unemployment on economic growth in South Africa (1994-2016)* [Ebook]. Munich Personal RePEc Archive.Retrieved July 29, 2022, from https://mpra.ub.uni-muenchen.de/85305/1/MPRA_paper_85305.pdf.

[7]. *Unemployment - Harmonised unemployment rate (HUR) - OECD Data*.The OECD(2022).Retrieved July 29, 2022, from https://data.oecd.org/unemp/harmonised-unemployment-rate-hur.htm.

[8]. *WDI - Economy*. Datatopics.worldbank.org. (2022). Retrieved July 29, 2022, from https://datatopics.worldbank.org/world-development-indicators/themes/economy.html.

[9]. *2022 World Population by Country*. Worldpopulationreview.com. (2022). Retrieved 3 August 2022, from https://worldpopulationreview.com.