



ARTICLE

The Effect of Economic Factors as Determinants of Unemployment in Sub-Saharan Africa

Binuyo, Babatunde O.¹; Lawal, Esther Omotola¹; Adesuyi, Oluwabukola Omobola^{*}
Edy-Ewoh, Uduakobong¹; Abiola-Bolade, Oluwatosin Adeola¹

¹ Department of Economics, Veronica Adeleke School of Social Sciences, Babcock University, Ilishan-Remo, Ogun State, Nigeria

^{*} Corresponding author: Adesuyi, Oluwabukola Omobola

Email: adesuyiolu@babcock.edu.ng

Abstract

This study examines the relationship between economic factors and unemployment in Sub-Saharan Africa (SSA), considering gross domestic product (GDP), inflation, interest rates, exchange rates and trade openness. It uses an ex post facto design and annual data from the World Development Indicators for 24 countries over the period 1996–2024. A panel autoregressive distributed lag model is estimated using mean group, pooled mean group (PMG) and dynamic fixed effects estimators. The reported Hausman comparisons favour PMG. In the PMG long-run results, log GDP is negatively associated with unemployment, while inflation, trade openness, the log exchange rate and the interest rate have positive coefficients. The reported error correction coefficient is -0.292 , indicating adjustment towards long-run equilibrium. The findings highlight the importance of considering output and monetary and external-sector conditions together when examining unemployment in SSA. Policy priorities include macroeconomic stability, productive investment, improved access to finance and structural measures that increase the employment content of growth. The estimated relationships inform these priorities without establishing a specific inflation target or optimal interest rate.

Keywords: Unemployment; gross domestic product; inflation; exchange rate; interest rate; trade openness

Cite as: Binuyo, B. O., Lawal, E. O., Adesuyi, O. O., Edy-Ewoh, U., & Abiola-Bolade, O. (2026). The Effect of Economic Factors as Determinants of Unemployment in Sub-Saharan Africa. *Applied Journal of Economics, Management, and Social Sciences*, 7(2), 13–21. <https://doi.org/10.53790/ajmss.v7i2.130>

1. Introduction

Unemployment is a long-standing problem in economies at every income level and presents important challenges in Sub-Saharan Africa (SSA). The region is endowed with human and natural resources capable of supporting economic performance (African Development Bank [AfDB], 2020; International Labour Organization [ILO], 2021; United Nations Economic Commission for Africa [UNECA], 2019). Several SSA economies, especially resource-rich economies, have recorded notable output growth (UNECA, 2021). Yet human development remains a concern (United Nations Development Programme [UNDP], 2018), and unemployment persists even in some of the continent's largest economies. The relationship between expanding output and labour market outcomes is the central concern of this study.

Unemployment reduces the utilisation of human capital, lowers income and welfare, and limits poverty reduction (ILO, 2024). Many new labour market entrants in SSA are absorbed into low-productivity informal work (World Bank Group, 2025). Underemployment weakens the contribution of education and skills to growth (Atake et al., 2025). Structural constraints compound these pressures, including infrastructure deficits in energy and transport that limit firms' capacity to expand employment (African Union Commission & Organisation for Economic Co-operation and Development [OECD], 2025).

Reversing these trends requires evidence-based policy, and evidence on the determinants of unemployment is the logical starting point. Each country's labour market and economic structure interacts with sociopolitical conditions to determine its unemployment rate (Onifade et al.,

2020), and the fundamental objective for both developed and emerging economies is to reduce unemployment while sustaining growth (Soylu et al., 2018).

Economic theory suggests that growth should reduce unemployment. Okun's law links expanding output to lower unemployment (Okun, 1962), while Keynesian theory emphasises the role of aggregate demand and government intervention in helping economies absorb shocks. Experiences in SSA illustrate the difficulty of translating growth into employment. Akeju and Olanipekun (2015) examined this relationship in Nigeria. Weak institutions can limit the employment benefits of resource endowments (Akinyele et al., 2023). Technological progress can raise productivity and output (Solow, 1956), while automation can displace routine labour and contribute to structural unemployment.

Numerous studies have examined unemployment's causes, including supply-side factors such as structural mismatch, frictional transitions and wage rigidities, and demand-side factors such as cyclical downturns (Blanchard, 2009; Pettinger, 2021; Pissarides, 1992). Findings on the growth–unemployment relationship remain mixed. Much of the literature examines growth in isolation or focuses on individual countries, limiting its implications for the region as a whole. Further evidence is needed on how output, inflation, trade openness, exchange rates and interest rates jointly relate to unemployment across SSA economies over an extended period.

This study examines the relationship between economic factors—inflation, gross domestic product (GDP), trade openness, exchange rates and interest rates—and unemployment in SSA from 1996 to 2024. The sample comprises 24 countries selected on the basis of regional coverage and data availability: Angola, Benin, Botswana, Burkina Faso, Burundi, Cabo Verde, Côte d'Ivoire, Eswatini, The Gambia, Guinea, Kenya, Madagascar, Mali, Mauritania, Mauritius, Mozambique, Niger, Nigeria, Senegal, Sierra Leone, Tanzania, Togo, Uganda and Zambia. Examining these factors together provides evidence for policymakers seeking to make growth more employment-generating.

2. Review of Literature

2.1 Theoretical framework

Numerous theories and hypotheses explore the relationship between unemployment and macroeconomic variables. Two anchor this study. Phillips (1958) described an inverse relationship between unemployment and the rate of change of money wages. Subsequent Phillips curve formulations examine price inflation and unemployment. Okun (1962) described an inverse

relationship between output and unemployment. The Phillips curve motivates the examination of nominal and monetary conditions, while Okun's law motivates the examination of real output. Together, these frameworks inform the study's analysis of macroeconomic conditions and unemployment.

The Phillips curve has often been interpreted as a short-run trade-off between inflation and unemployment. The expectations-augmented framework explains why a trade-off cannot be assumed to persist: workers and firms adjust their inflation expectations over time. Crump et al. (2024) identified a role for negative unemployment gaps in inflation during the COVID-19 recovery in the United States, alongside temporary supply factors. This study distinguishes the short-run relationship from the longer-run effects of macroeconomic conditions.

This study uses an extended Phillips curve framework that includes the exchange rate, the interest rate and trade openness, reflecting the macroeconomic structure of open, import-dependent SSA economies. GDP represents the output channel motivated by Okun's law. The proposed long-run signs are positive for inflation, exchange rate depreciation and high interest rates, and negative for trade openness and output.

For inflation, the expected positive sign rests on the view that sustained or high inflation raises uncertainty and input costs, erodes real incomes and demand, and discourages employers from hiring, which increases unemployment over the long run. This differs from the short-run trade-off in the original Phillips curve, and the estimation in this study is positioned to capture the long-run effect of inflation in a panel of countries over an extended period.

For the exchange rate, currency depreciation can raise the cost of imported inputs and capital goods, especially where domestic industrial capacity is limited. Exchange rate uncertainty can also make it harder for firms to plan, invest and hire. A weaker currency may improve export competitiveness, but in economies with narrow export bases, this benefit may be outweighed by higher import costs. These channels motivate an expected positive association between the exchange rate and unemployment, subject to the exchange rate's definition and quotation convention.

For the interest rate, high rates raise the cost of borrowing and restrict firms' access to credit. This slows investment, limits business expansion, and reduces job creation, which pushes unemployment upward. The effect is expected to be especially strong for small and medium-sized enterprises that depend on formal credit.

For trade, greater openness is expected to reduce unemployment by expanding markets for domestic

producers, attracting foreign investment, and stimulating growth that creates jobs. The short-term effects may vary with the competitiveness of domestic industries, because import competition can displace workers in uncompetitive sectors before the gains from new export and investment opportunities materialize.

For economic growth, Okun's law leads to the expectation that unemployment falls as output rises. As the review of literature shows, the empirical evidence on this relationship is mixed, particularly in SSA, where growth has often been concentrated in capital-intensive and resource-based sectors that absorb little labour. The framework therefore treats the growth–unemployment relationship as an empirical question rather than an assumption, and the results are interpreted with attention to the employment content of growth in the region.

2.2 Economic growth and unemployment

Research on economic growth and unemployment yields different results across contexts and methods. Studies reporting a negative relationship include **Soylu et al. (2018)**, whose panel results support Okun's law in Eastern European countries. Other studies considered in this review include **Abiodun et al. (2025)**, **Chiranga et al. (2025)**, **Muhammad (2023)**, **Egbetunde and Adesina (2022)**, **Meseda and Nwankwo (2023)**, and **Shaikh (2025)**. Their research questions, direction of estimation and measures of output need to be distinguished when assessing the growth–unemployment relationship. Business cycle fluctuations, measurement differences and the employment content of investment may help explain divergent findings.

Baah-Boateng (2013) examined unemployment in Ghana in the context of weak employment creation despite strong economic growth. The study found that low-employment-generating sectors expanded more rapidly than sectors with greater labour absorption. Cross-sectional probit estimates indicated a strong role for demand factors and a limited employment-generating impact of growth. Reservation wages also influenced unemployment, and the study recommended policies promoting labour-absorbing sectors and targeted support for young jobseekers.

Michael et al. (2016) examined the relationship between unemployment and economic growth in Nigeria from 1980 to 2013, focusing on the impact of unemployment on growth. They used cointegration tests, the vector error correction model (VECM), and Granger causality tests. The Granger results indicated a unidirectional relationship between unemployment and real gross domestic product (GDP), with causality running from real GDP to unemployment.

Suleiman et al. (2017) assessed the influence of unemployment on economic growth in Tanzania and explored the causal connection between the two. They used cointegration and dynamic ordinary least squares (DOLS) to examine the relationship and the Granger causality test to investigate causation. Their findings suggested that unemployment had a positive effect on growth, although the effect was not statistically significant over the study period. The Granger test identified a one-way causal relationship from unemployment to economic growth.

Abraham and Osaru (2017) examined the relationship between the total unemployment rate and the economic growth rate in low-income SSA countries. Using panel least squares and ordinary least squares on annual data from 1991 to 2013, they found a negative relationship between unemployment and growth in the panel model. In some individual countries, however, the relationship was positive, which they interpreted as a case of non-inclusive growth.

Soylu et al. (2018) examined economic growth and unemployment in Eastern European countries from 1992 to 2014 within a panel data framework. They applied panel unit root, pooled panel ordinary least squares and panel Johansen cointegration tests. Their estimated relationship was negative: higher GDP was associated with lower unemployment, consistent with Okun's law.

2.3 Inflation and unemployment

Recent empirical research supports a role for labour market conditions in short-run inflation dynamics. **Crump et al. (2024)** found that negative unemployment gaps contributed to inflationary pressure during the COVID-19 recovery in the United States, alongside temporary supply factors.

African evidence illustrates the importance of distinguishing short-run relationships from longer-run effects. **Onifade et al. (2020)** found support for the Phillips curve in Nigeria, while evidence supporting Okun's law was confined to the short run. The relationship between inflation and unemployment therefore needs to be assessed in its country context and over the relevant time horizon.

Other African studies report contrasting findings. **Umoru and Anyiwe (2013)** examined inflation and unemployment in Nigeria using a vector error correction model over 27 years and reported evidence of stagflation. **Mohamed et al. (2016)** analysed annual data for Sudan from 1992 to 2015 using Granger causality tests. Neither variable Granger-caused the other over the study period; these tests did not establish a directional predictive relationship.

2.4 Summary and research gap

The literature examines the relationships between macroeconomic conditions and unemployment. Okun's law informs the analysis of output and unemployment, while the Phillips curve informs the analysis of inflation and unemployment. Empirical findings vary with methods, data sources, country context and time horizon.

Many reviewed studies use single-country or time-series approaches and examine output or inflation separately. This study examines GDP, inflation, trade openness, the exchange rate and the interest rate together in a panel of 24 SSA countries over an extended period. The next section describes the methodology.

3. Methodology

The study employed an ex post facto research design, using events and data that had already been recorded (Cohen et al., 2018). Published secondary data were

obtained from the World Development Indicators database (World Bank, n.d.). The study did not experimentally manipulate the variables.

The panel design examines variation across countries and over time. A panel autoregressive distributed lag (ARDL) approach is used to estimate short-run dynamics and long-run relationships. ARDL methods can accommodate a mixture of I(0) and I(1) variables, subject to their assumptions and appropriate integration and cointegration checks (Pesaran et al., 2001). Estimation requires appropriate unit root and cointegration checks, together with consideration of omitted-variable bias and serial correlation. The mean group (MG), pooled mean group (PMG) and dynamic fixed effects (DFE) estimators are compared. PMG constrains long-run coefficients to be common across countries while allowing short-run coefficients and error variances to differ (Pesaran et al., 1999).

3.1 Model specification

Unemployment may be associated with several macroeconomic variables in addition to inflation and output. Following Folawewo and Adeboje (2017), the empirical relationship is expressed as:

$$y_{it} = \alpha_0 + \beta' X_{it} + \varepsilon_{it} \quad (3.1)$$

Here, y represents unemployment, X is the vector of the five proposed economic determinants, α_0 is the intercept, β is the corresponding coefficient vector and ε is the error term. The subscript i identifies the selected SSA country, while t identifies the year.

The functional relationship between unemployment and the economic factors is specified as:

$$UNEMP_{it} = f(INF_{it}, LGDP_{it}, TOPEN_{it}, LEXR_{it}, INTR_{it}) \quad (3.2)$$

The econometric specification corresponding to Equation (3.2) is:

$$UNEMP_{it} = \alpha_0 + \alpha_1 INF_{it} + \alpha_2 LGDP_{it} + \alpha_3 TOPEN_{it} + \alpha_4 LEXR_{it} + \alpha_5 INTR_{it} + \varepsilon_{it} \quad (3.3)$$

INF denotes inflation; GDP, gross domestic product; TOPEN, trade openness; and INTR, the interest rate. EXR is the official exchange rate, local currency units per US dollar, period average (PA.NUS.FCRF), sourced from IMF International Financial Statistics through WDI. LGDP and LEXR are natural logarithms of GDP and the exchange rate. Subscripts identify country and year; remaining terms are the intercept, slope coefficients and error term.

The model was adapted from Folawewo and Adeboje (2017).

4. Results and Discussion

4.1 Descriptive statistics and estimation results

Table 1

Descriptive Statistics

Statistic	UNEMP	INF	GDP	TOPEN	EXR	INTR
Mean	6.348752	15.54833	1601.564	44.98392	682.7204	7.593830
Maximum	28.24000	4145.106	10956.95	1647.026	9565.082	52.43679
Minimum	0.320000	-3.23339	234.7092	0.681005	0.128029	-93.5135
Standard deviation	5.760078	166.9295	1776.768	196.6202	1266.211	11.42498
Skewness	1.863741	24.33932	2.574792	5.572966	4.044233	-1.47561
Kurtosis	6.155136	602.1602	10.29498	35.19138	23.15138	20.15320
Jarque-Bera	620.0740	9395426	2073.108	30173.44	12259.03	7876.497
<i>p</i> value	< .001	< .001	< .001	< .001	< .001	< .001
Observations	624	624	624	624	624	624

Note. UNEMP = unemployment rate; INF = inflation; GDP = gross domestic product; TOPEN = trade openness; EXR = exchange rate; INTR = interest rate. Source: Authors' computations using EViews 12 (2026).

Table 2

Panel Unit Root Tests

Test method	UNEMP	INF	LGDP	TOPEN	LEXR	INTR
<i>Common unit root process</i>						
Breitung (t statistic)	-10.031*** _b	-4.366*** _a	-7.114*** _b	-10.727*** _b	-5.768*** _b	-4.835*** _a
Levin–Lin–Chu (t*)	-4.178*** _b	-5.079*** _b	-2.17*** _a	-2.775*** _a	-3.816*** _a	-6.857*** _a
<i>Individual unit root processes</i>						
IPS (z-t-tilde-bar)	-10.135*** _b	-10.451*** _a	-10.636*** _b	-1.971*** _a	-3.201*** _a	-10.016*** _a
ADF Fisher (χ^2)	3.363*** _b	3.697*** _b	1.819*** _b	2.896*** _a	4.675*** _a	3.978*** _b
Number of Cross-Sections	24	24	24	24	24	24
Number of Periods	37	37	37	37	37	37
Total Number of Observations	370	370	370	370	370	370

Note. a denotes stationarity at levels; b denotes stationarity at first differences. *** $p < .01$. ** $p < .05$. * $p < .10$. LGDP and LEXR denote logged GDP and exchange rate. Source: Authors' computations using Stata 15 (2026).

Table 2 reports panel unit root tests at levels and first differences. The reported integration classifications differ across tests for some variables.

The panel ARDL model was estimated using MG, PMG and DFE estimators. Hausman tests were then used to compare the estimators. In the reported MG–PMG comparison, the *p* value is .1047; in the MG–DFE comparison, it is .0285. At the 5% level, the first comparison does not reject the restrictions underlying PMG, whereas the second rejects those underlying DFE. The study therefore interprets the PMG estimates. Table 3 presents the reported coefficients for all three estimators, including estimates without significance markers.

Table 3*Unemployment and Economic Factors in Sub-Saharan African Countries*

Variable	MG	PMG	DFE
<i>Short-run coefficients</i>			
D.INF	-0.0233* (0.0124)	-0.00209 (0.07643)	0.00201 (0.00238)
D.LGDP	-4.278** (1.832)	-3.453* (1.778)	-3.889*** (0.642)
D.TOPEN	0.256 (0.178)	0.131 (0.112)	0.0000701 (0.00107)
D.LEXR	-0.671* (0.350)	-0.335 (0.508)	-0.440*** (0.161)
D.INTR	-0.00160 (0.0115)	-0.00356 (0.00446)	0.00169 (0.00389)
<i>Long-run coefficients</i>			
Constant	2.59 (8.166)	3.954* (2.133)	1.426 (1.202)
INF	-0.323 (0.297)	0.0178 (0.00733)	0.0179 (0.0207)
LGDP	-0.606 (8.036)	-5.254* (0.594)	-1.202 (1.533)
TOPEN	0.299 (0.567)	0.282* (0.0527)	-0.00355 (0.00347)
LEXR	-5.609 (4.938)	1.071* (0.159)	0.562 (0.598)
INTR	-0.0621 (0.0885)	0.0318* (0.0186)	0.0831* (0.0464)
<i>Adjustment coefficient</i>			
ECT	-0.0805* (0.0462)	-0.292*** (0.0514)	-0.119* (0.0203)
Hausman test (χ^2)		6.91 (0.1047)	12.50** (0.0285)
Observations	600	600	600

Note. Dependent variable: UNEMP. MG = mean group; PMG = pooled mean group; DFE = dynamic fixed effects; D. denotes first differences; ECT = error correction term. Standard errors are in parentheses; parentheses beneath Hausman statistics contain p values. *** p < .01. ** p < .05. * p < .10. Source: Authors' computations using Stata 15 (2026).

4.2 Short-run dynamics

A compact error correction representation of the short-run relationship is shown below. X is the vector of the five regressors, δ is the vector of short-run coefficients and L collects any additional lagged difference terms. The numerical expression summarises the PMG coefficients reported in Table 3.

$$\Delta UNEMP_{it} = \phi_i ECT_{i,t-1} + \delta_i' \Delta X_{it} + L_{it} + \varepsilon_{it} \quad (4.1)$$

$$\begin{aligned} \Delta UNEMP_{it} = & -0.292 ECT_{i,t-1} - 0.00209 \Delta INF_{it} - 3.453 \Delta LGDP_{it} \\ & + 0.131 \Delta TOPEN_{it} - 0.335 \Delta LEXR_{it} - 0.00356 \Delta INTR_{it} + L_{it} + \varepsilon_{it} \end{aligned} \quad (4.2)$$

The reported PMG error correction coefficient is -0.292 and carries a 1% significance marker. Its negative sign indicates adjustment towards long-run equilibrium; its magnitude implies approximately 29.2% adjustment per annual period. Short-run inflation is -0.00209 and has no significance marker; the coefficient on the change in log GDP is -3.453 and carries a 10% significance marker.

The short-run PMG coefficients for trade openness, the log exchange rate and the interest rate are 0.131, -0.335 and -0.00356, respectively, with no significance markers in the revised table.

4.3 Long-run dynamics

The long-run relationship and its numerical PMG representation are expressed as follows:

$$UNEMP_{it} = \alpha_0 + \alpha_1 INF_{it} + \alpha_2 LGDP_{it} + \alpha_3 TOPEN_{it} + \alpha_4 LEXR_{it} + \alpha_5 INTR_{it} + \varepsilon_{it} \quad (4.3)$$

$$UNEMP_{it} = 3.954 + 0.0178 INF_{it} - 5.254 LGDP_{it} + 0.282 TOPEN_{it} + 1.071 LEXR_{it} + 0.0318 INTR_{it} + \varepsilon_{it} \quad (4.4)$$

The PMG long-run coefficients in Table 3 are positive for inflation (0.0178), trade openness (0.282), the logged exchange rate (1.071) and the interest rate (0.0318), and negative for logged GDP (-5.254). These estimates associate higher output with lower unemployment and identify monetary and external-sector conditions as relevant to labour market outcomes. Because GDP and the exchange rate enter in logs while unemployment enters in levels, these coefficients are not unemployment elasticities.

The revised PMG table marks logged GDP, trade openness, the logged exchange rate and the interest rate as significant at 10%. Inflation has no significance marker.

The results are discussed alongside earlier studies of macroeconomic conditions and unemployment. **Ani et al. (2019)** examined exchange rates and unemployment in Nigeria from 1986 to 2017 using an ARDL model and reported a positive exchange rate relationship. **Folawewo and Adeboje (2017)** examined macroeconomic determinants of unemployment in the Economic Community of West African States using fixed effects, random effects and fully modified ordinary least squares. They reported a negative but statistically insignificant relationship between GDP growth and unemployment, indicating a limited employment response to growth.

5. Conclusion and Policy Implications

This study examined economic factors associated with unemployment in 24 SSA countries from 1996 to 2024. Country coverage was determined by data availability.

The analysis considered GDP, inflation, the interest rate, the exchange rate and trade openness. The reported PMG long-run coefficients are negative for log GDP and positive for inflation, trade openness, the log exchange rate and the interest rate. The negative error correction coefficient indicates adjustment towards long-run equilibrium. These findings describe relationships in the selected sample.

Unemployment remains an important socioeconomic challenge in SSA. Rapid population growth, structural economic weaknesses and limited industrial

diversification place pressure on the region's labour markets. The study highlights the relevance of macroeconomic conditions to employment outcomes.

Output expansion can support job creation, but growth concentrated in extractive or capital-intensive activities may generate limited employment. Exchange rate uncertainty can discourage investment and increase imported input costs. High borrowing costs may constrain business expansion, while sustained inflation can erode purchasing power and increase uncertainty. Trade openness can expand opportunities, but adjustment costs and import competition may weaken employment in vulnerable sectors.

The authors recommend coordinated policies to address unemployment. Maintaining low and stable inflation can support household purchasing power and investment planning. Affordable credit, particularly for small and medium-sized enterprises, may support productive investment and employment. The appropriate monetary policy stance must nevertheless reflect country-specific inflation, financial stability and macroeconomic conditions; the reported estimates do not establish a particular inflation target or an optimal policy rate.

Reducing disruptive exchange rate uncertainty and strengthening macroeconomic stability may help firms plan and invest. Fiscal discipline, adequate external buffers and export diversification can reduce exposure to external shocks. Investment in infrastructure, digital technologies, industrial capacity and skills can support movement from low-productivity activities into more productive employment. Trade reforms should be accompanied by skills development and support for sectors facing adjustment costs.

Addressing unemployment in SSA requires coordination among monetary, fiscal, trade and structural policies. Macroeconomic stability and productive investment should be combined with measures that strengthen the employment content of growth and expand opportunities for the region's labour force.

References

- Abiodun, A. A., Magaji, S., & Ismail, Y. (2025). Empirical analysis of the impact of unemployment on economic growth in Nigeria. *International Journal of Innovative Finance and Economics Research*, 13(2), 63–80. <https://doi.org/10.5281/zenodo.15311427>
- Abraham, I. O., & Osaru, O. O. F. (2017). Unemployment and economic growth: Evidence from low-income countries in Sub-Saharan Africa. *Journal of Finance, Banking and Investment*, 4(2), 29–42.
- African Development Bank. (2020). *African economic outlook 2020: Developing Africa's workforce for the future*. <https://www.afdb.org/en/documents/african-economic-outlook-2020>
- African Union Commission & Organisation for Economic Co-operation and Development. (2025). *Africa's development dynamics 2025: Infrastructure, growth and transformation*. OECD Publishing. <https://doi.org/10.1787/c2b40285-en>
- Akeju, K. F., & Olanipekun, D. B. (2015). Unemployment and economic growth in Nigeria. *International Journal of African and Asian Studies*, 11, 92–99.
- Akinyele, O. D., Oloba, O. M., & Mah, G. (2023). Drivers of unemployment intensity in sub-Saharan Africa: Do government intervention and natural resources matter? *Review of Economics and Political Science*, 8(3), 166–185. <https://doi.org/10.1108/REPS-11-2020-0174>
- Ani, E. C., Joel, E., & Baajon, M. A. (2019). Exchange rate and unemployment in Nigeria: An analysis. *International Journal of Family Business and Management*, 3(2), 1–7.
- Atake, E.-H., Kolani, L., & Koriko, M. (2025). Human capital, underemployment, and economic growth in Sub-Saharan Africa. *Journal of the Knowledge Economy*, 16(2), 10329–10355. <https://doi.org/10.1007/s13132-024-02307-y>
- Baah-Boateng, W. (2013). Determinants of unemployment in Ghana. *African Development Review*, 25(4), 385–399. <https://doi.org/10.1111/1467-8268.12037>
- Blanchard, O. (2009). *Macroeconomics*. Pearson Education.
- Chiranga, N., Chingoiro, S., & Zhanje, S. (2025). The nexus between unemployment and economic growth: An empirical enquiry into Okun's law on South Africa's provinces (2008–2024). *Athens Journal of Business & Economics*, 11(5), 1–20.
- Cohen, L., Manion, L., & Morrison, K. (2018). *Research methods in education* (8th ed.). Routledge.
- Crump, R. K., Eusepi, S., Giannoni, M., & Şahin, A. (2024). *The unemployment-inflation trade-off revisited: The Phillips curve in COVID times* (Staff Report No. 1086). Federal Reserve Bank of New York. <https://doi.org/10.59576/sr.1086>
- Egbetunde, T., & Adesina, T. M. (2022). Poverty, unemployment and economic growth in Sub-Saharan Africa. *Journal of Management and Social Sciences*, 11(1). <https://doi.org/10.53704/jmss.v11i1.405>
- Folawewo, A. O., & Adeboje, O. M. (2017). Macroeconomic determinants of unemployment: Empirical evidence from Economic Community of West African States. *African Development Review*, 29(2), 197–210.
- International Labour Organization. (2021). *World employment and social outlook: Trends 2021*. <https://www.ilo.org/publications/world-employment-and-social-outlook-trends-2021>
- International Labour Organization. (2024). *World employment and social outlook: Trends 2024*. <https://www.ilo.org/publications/flagship-reports/world-employment-and-social-outlook-trends-2024>
- Meseda, D. S., & Nwankwo, O. (2023). *Selected macroeconomic variables and economic growth in Nigeria (2000–2023)*. Prince Abubakar Audu University.
- Michael, E. O., Emeka, A., & Emmanuel, E. N. (2016). The relationship between unemployment and economic growth in Nigeria: Granger causality approach. *Research Journal of Finance and Accounting*, 7(24), 153–162.
- Mohamed, B., Abdulrahman, A., Ahmed, A., Sabil, S., & Adam, A. A. (2016). The relationship between unemployment and inflation in Sudan: An empirical analysis, 1992–2015. *Research in Economics and Management*, 1(2), 113–122. <https://doi.org/10.22158/rem.v1n2p113>

- Muhammad, I. S. (2023). Unemployment and economic growth: Testing the validity of Okun's law in Nigeria. *International Journal of Research and Innovation in Social Science*, 7(12), 233–242. <https://doi.org/10.47772/IJRIS.2023.7012019>
- Okun, A. M. (1962). Potential GNP: Its measurement and significance. *Proceedings of the Business and Economic Statistics Section of the American Statistical Association*, 98–104.
- Onifade, S. T., Ay, A., Asongu, S., & Bekun, F. V. (2020). Revisiting the trade and unemployment nexus: Empirical evidence from the Nigerian economy. *Journal of Public Affairs*, 20(3), Article e2053. <https://doi.org/10.1002/pa.2053>
- Pesaran, M. H., Shin, Y., & Smith, R. J. (2001). Bounds testing approaches to the analysis of level relationships. *Journal of Applied Econometrics*, 16(3), 289–326. <https://doi.org/10.1002/jae.616>
- Pesaran, M. H., Shin, Y., & Smith, R. P. (1999). Pooled mean group estimation of dynamic heterogeneous panels. *Journal of the American Statistical Association*, 94(446), 621–634. <https://doi.org/10.1080/01621459.1999.10474156>
- Pettinger, T. (2021). *Causes of unemployment*. Economics Help. <https://www.economicshelp.org>
- Phillips, A. W. (1958). The relation between unemployment and the rate of change of money wage rates in the United Kingdom, 1861–1957. *Economica*, 25(100), 283–299.
- Pissarides, C. A. (1992). Loss of skill during unemployment and the persistence of employment shocks. *The Quarterly Journal of Economics*, 107(4), 1371–1391.
- Shaikh, A. S. (2025). The impact of macroeconomic indicators on GDP growth: An empirical analysis. *International Journal of Science and Research Archive*, 16(2), 1277–1282. <https://doi.org/10.30574/ijrsra.2025.16.2.2444>
- Solow, R. M. (1956). A contribution to the theory of economic growth. *The Quarterly Journal of Economics*, 70(1), 65–94.
- Soylu, Ö. B., Çakmak, İ., & Okur, F. (2018). Economic growth and unemployment issue: Panel data analysis in Eastern European countries. *Journal of International Studies*, 11(1), 93–107. <https://doi.org/10.14254/2071-8330.2018/11-1/7>
- Suleiman, S. H., Kassim, S. T., & Moh, I. (2017). Unemployment and economic growth in Tanzania. *Journal of Economics, Management and Trade*, 20(2), 1–8.
- Umoru, D., & Anyiwe, M. A. (2013). Dynamics of inflation and unemployment in a vector error correction model. *Research on Humanities and Social Sciences*, 3(3), 20–29. <https://www.iiste.org/Journals/index.php/RHSS/article/view/4926>
- United Nations Development Programme. (2018). *Human development indices and indicators: 2018 statistical update*. <https://hdr.undp.org/content/statistical-update-2018>
- United Nations Economic Commission for Africa. (2019). *Economic report on Africa 2019: Fiscal policy for financing sustainable development in Africa*.
- United Nations Economic Commission for Africa. (2021). *Economic report on Africa 2021: Addressing poverty and vulnerability in Africa during the COVID-19 pandemic*.
- World Bank. (n.d.). *World Development Indicators* [Data set]. <https://databank.worldbank.org/source/world-development-indicators>
- World Bank Group. (2025). *Africa's pulse: Pathways to job creation in Africa*.