

## ECONOMIC GROWTH AND UNEMPLOYMENT: AN EMPIRICAL ASSESSMENT OF OKUN'S LAW IN THE CASE OF LIBERIA

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### Abstract

The aim of this research is to look at the relationship between economic growth and unemployment in Liberia from 2001 to 2019. To investigate the association between unemployment and Gross Domestic Product (GDP), the unit root test, the Augmented Dickey-Fuller (ADF) Co-integration test, and the Standard Granger Causality test were used. The Auto Regressive Distribution Lag (ARDL) bounds test is used to decide if the variables have a long run linkage. The ARDL model findings indicate that there is no long-run association between unemployment and economic growth. The findings of this analysis have especially significant policy implications for Liberian economic policymakers. The observational findings revealed a negligible association between unemployment and economic growth in both the long and short term. The Liberian government should redirect its spending toward activities that directly and indirectly promote the creation of employment and decent jobs, a conducive environment and flexible labor market policies or legislation that are not impediments to job creation should be created, and finally, the government should prioritize industries that promote labor intensive.

**Keywords:** Okun's law, unemployment rate, Economic Growth, Liberia,

### Introduction

For several years, the unemployment rate in Liberia has been cited as 85 percent, which is completely implausible. This statistic was actually proposed as the unemployment rate in late 1991 or early 1992. At the moment, Liberia's civil war was at its height; all government offices had been closed, and several large corporations, like LAMCO and Firestone, had been taken over by warring groups. During the fighting, the economy totally failed. Liberia's GDP peaked in 1979, started to fall after the 1980 uprising, and then fell completely after the start of the war in 1989. Between 1987 and 1995, GDP plummeted by a staggering 90%. Since the conflict subsided in 1996 and elections were conducted in 1997, the economy started to recover. However, the conflict quickly re-emerged, and the bloodshed hit new heights in 2002 and 2003, before the peacekeepers arrived in mid-2003. At the time of the 2005 polls, Liberia's net wage was just one-quarter of what it had been in 1987, and one-sixth of what it had been in 1979. In 2005, GDP per capita was \$160 in nominal terms.

The International Labour Organization (ILO) describes the unemployed as the amount of economically productive individuals who are unemployed but eligible for and finding employment, including those who have lost their jobs and those who have willingly abandoned their jobs (World Bank, 1998:63). Housewives, full-time teachers, invalids, those under the lawful working age, the elderly, and aged people are several

examples. The unemployment rate is calculated as a proportion of the overall amount of people looking for work at any given period. It is generally agreed in economics that an economy's GDP growth rate raises wages and decreases unemployment. Population growth and unemployment continue to be major issues in every country, regardless of their degree of economic progress. Countries' development strategies are geared toward fostering economic prosperity and lowering unemployment. Despite the fact that there is a large body of research on the connection between economic growth and unemployment, there is little agreement on the course and strength of the relationship. Differences in economic structures of countries have a large impact on the relationship between economic growth and unemployment. Okun's Law refers to the scientific proposition linking production and unemployment. This is one of the most well-known relationships in macroeconomic theory, and it has been shown to be true for a number of countries and continents, mostly in developing countries (Lee, 2000; Farsio and Quade, 2003; Christopoulos, 2004; Daniels and Ejara, 2009). Sustained inflation along with job-creating reforms gradually reduces the crucial issue of unemployment. Growth is a necessary component for humanity's progress and development. Growth contributes to the improvement of people's living standards.

According to Okun (1962), as quoted by Kemi and Dayo (2014), unemployment has a detrimental association with economic growth. As a consequence, changes in overall demand cause changes in agricultural output patterns, which in turn cause changes in labor demand, altering a country's unemployment position. Economists have taken notice of this pattern, not just because of its strong methodological regularity, but also because of its significance as a macroeconomic building block. It provides the aggregate supply curve when compared with the Phillips curve. It also has consequences for macroeconomic policy, specifically deciding the optimum or ideal growth rate. Dahmani (2008), Mossa (2008) (2013). In Liberia, the unemployment crisis takes on new forms due to the presence of underemployment. In this case, certain individuals are working but are underpaid, preventing them from meeting their essential needs such as food, clothes, and housing. Kemi and Dayo (2014) have addressed another form of unemployment known as disguised unemployment, which occurs when people take positions that are insufficient for their educational qualifications and experience. The aim of this research is to determine the applicability of Okun's law in Liberia. The research would specifically investigate the effect of unemployment on Liberian economic growth and measure the vulnerability of productivity to changes in unemployment rates in both the short and long term. According to Osinubi (2005), while economic growth is important in reducing unemployment and alleviating poverty, it is not adequate because economic growth alone cannot solve all of the vital factors that lead to poverty and unemployment. As a result, further policies that aid in the development of investment initiatives are needed, which will allow job production, stimulate economic growth, and alleviate poverty and unemployment.

Table 1 shows the unemployment rate and economic growth trends from 2001 to 2019. According to World Development Indicators (World Bank), the unemployment rate in Liberia fluctuated between 3.08 percent, 3.00 percent, 2.94 percent, and 2.89 percent. During the civil war in 2003, the growth rate fell by -30.15 percent. In this report, we offer an analytical overview of Liberia's contentious relationship between GDP and unemployment.

Table 1. Data

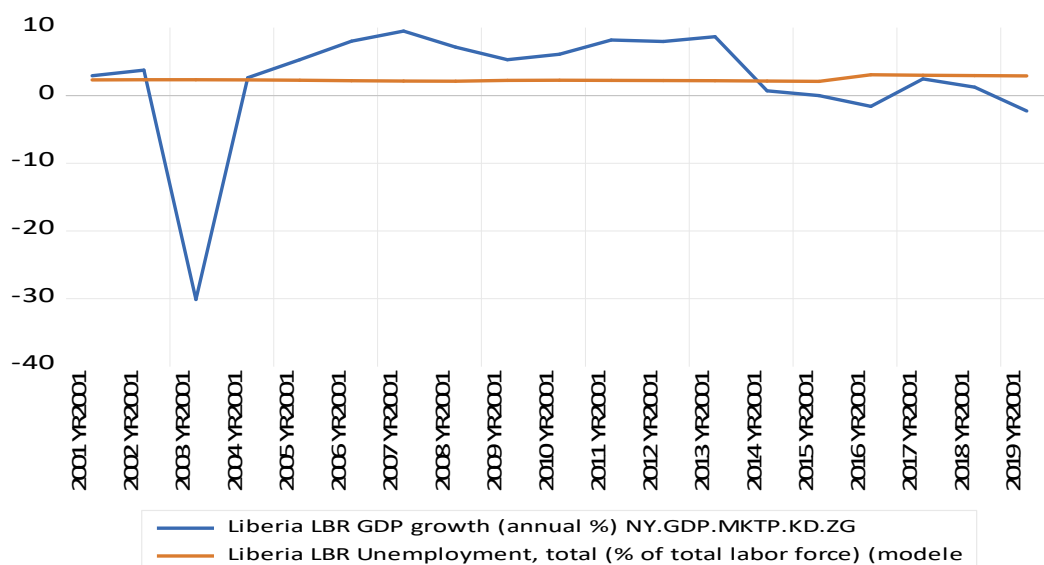


figure 1. GDP GROWTH AND UNEMPLOYMENT (Source: World Bank)

The following is how this article is structured: Section two discusses a summary of the literature, while Section three presents evidence and methods. Section four discusses scientific findings, and Section five concludes and makes policy recommendations.

## Literature Review

### Unemployment and economic growth

Several analysts are interested in the correlation between unemployment and economic growth (Lee, 2000; Viren, 2001; Harris and Silverstone, 2001; Sogner and Stiassny, 2002). This relationship was confirmed empirically by Okun's analysis. Okun (1962) discovered an inverse association between the unemployment rate and potential output in his analysis of the United States, based on labor force engagement, hours of service, and growth evolution. Indeed, Okun (1962) demonstrated that the theoretical foundation of these studied relationships is dependent on the fact that a growth in labour force would deliver more products and services. Furthermore, he discovered that the unemployment rate fell during years where the real growth rate was strong, whereas it rose during years when the real growth rate stayed poor or even negative.

Despite robust theoretical and analytical studies on the relationship between unemployment and economic growth over the last several decades, policymakers continue to be divided on the topic. The report provides a short overview of the various research that looked at the connection between unemployment and economic development. Arthur Okun was a leader in the analysis of the relationship between unemployment and economic growth. According to Okun's (1962) research, if GDP increases exponentially, the unemployment rate falls; if growth is slow or negative, the unemployment rate rises; and if growth approaches potential, the unemployment rate stays unchanged. Following that, most experiments were conducted to determine the validity of Okun's rule.

Saungweme et al. (2019) studied the relationship between economic growth, formal employment, gross fixed formation, and money supply in Zimbabwe. The dependent variable was formal employment, while the independent variables were economic growth, gross fixed formation, and money supply. The study used the Ordinary Least Squares methodology to discover that economic growth and gross capital formation have a positive impact on formal employment. As a result, increased economic growth in Zimbabwe creates more jobs, while the purchase of machinery in Zimbabwe creates more jobs, increases production capacity, resulting in formal job creation

Knotek (2007) estimated Okun's law using three versions: difference, gap, and dynamic, in which he calculated effects on unemployment rate by current output, past output level, past unemployment rate, and analyzed how a slowdown in the economy coincided with an increase in the unemployment rate is not always the case in both the short and long run.

Mitchell and Pearce (2010) discovered that the unemployment rate and GDP growth move in opposite directions, but that the change in the unemployment rate has less influence on GDP growth than Okun's coefficient benchmark.

Moosa (1997) examined the applicability of Okun's law to the United States and discovered that North America has the highest coefficient and Japan has the lowest, which can be clarified by disparities in labor market rigidities. Later, Moosa (2008) retested this relationship for other countries (four Arab countries: Algeria, Egypt, Morocco, and Tunisia) and demonstrated that increased productivity does not translate into increased jobs in these four countries, implying that the Okun coefficient is statistically negligible. Sadiku et al., (2015) discovered that using Okun's law and four forms of models (difference model, dynamic model, ECM, and VAR estimation approach) on quarterly Macedonia data from 2000 to 2012, not all models have clear proof and do not support an inverse association between the unemployment rate and economic development, as Okun's law indicated.

Prachowny (1993) estimated Okun's law using its gap version, then calculated the non-accelerating inflation rate of unemployment (NAIRU) and output gap, and verified the negative relationship between the variables involved. Freeman (2001) tested Okun's law for ten industrial countries (the United States, the United Kingdom, Japan, Canada, Germany, Italy, France, the Netherlands, Sweden, and Australia), including new developments with trend decomposition, and discovered that Okun's coefficient, which was originally three points, is now less than two points for every one percent increase in GDP.

Christopoulos (2004) estimated Okun's law at the regional level in Greece using unit root tests and cointegration tests on panel data and discovered that the results are consistent in six of the thirteen regions studied. Sogner (2001) calculated Okun's law for the Austrian economy using quarterly unemployment and GDP growth data. Okun's coefficient was discovered to be 4.16, which is approximately 2 to 3 percent at first. According to Neely (2010), Okun's coefficients are lower in industrialized countries with less regulated labor markets. Because it is easier to lay off workers, unemployment is more sensitive to changes in output. He continues, "The Okun's coefficient can change."

Other studies have included more variables in their analyses of economic growth and unemployment (for example, Alrayes and Wadi 2018; Bayar 2016; Sahoo and Sahoo 2019; Sahnoun and Abdennadher 2019; Ramudo et al. 2014). Alrayes and Wadi (2018) investigated the factors that contribute to unemployment in Bahrain. The research looked at economic growth, inflation, government spending, and gross capital

formation. The authors conducted a time series analysis and discovered that economic growth and inflation have no effect on unemployment. In contrast, the study discovered a positive relationship between gross capital formation and Government spending and joblessness. Sahoo and Sahoo (2019) used the same methodology and variables in a study conducted in India between 1991 and 2017. According to the findings of the study, economic growth and gross capital formation are positively related to unemployment.

The peaks and troughs in economic growth have no effect on unemployment in Bahrain. However, in India, increased economic growth is accompanied by an increase in the unemployment rate. The outcomes differ due to the economic policies implemented in each country.

Villaverde and Maza (2009) examined Okun's rule for the Spanish regions from 1980 to 2004. They discovered an inverse association between unemployment and economic growth in the majority of regions and around the globe. As a result, they assumed that there is a geographical difference in efficiency, which describes the heterogeneity in the coefficients. Michael et al., (2016) used the cointegration test, the Vector Error Correction Model (VECM) technique, and the Granger causality test to investigate the association between long-term economic growth and unemployment in Nigeria from 1980 to 2013. He demonstrated a similar association between unemployment and economic growth variables, that unemployment has a detrimental and substantial effect on GDP, and that there is a unidirectional relationship between UNEMPLOYMENT and GDP, with causality extending from economic growth to unemployment.

Geidenhuys and Marinkov (2007) attempted to answer the question of how unemployment in South Africa responds to changes in output. As a result, they calculated the relationship between economic activity and the unemployment rate. The findings indicated the presence of an Okun's law relationship in South Africa from 1970 to 2005, with more evidence pointing to asymmetries during recessions.

Banda (2016) studied the connection between unemployment and economic growth in South Africa from 1994 to 2012. The results of Johansen co-integration showed that the variables had a long run relationship. The findings have revealed a favorable association between GDP and unemployment in South Africa. Biyase and Bonga-Bonga (2010) used OLS to determine that the relationship between growth and jobs is 'paradoxical,' which implies that the South African unemployment rate is attributed to export production that is not adequately job-generating, whereas labor force participation rates are increasing.

Kreishan (2011) investigated this relationship on the Jordanian economy from 1970 to 2008, employing time series analysis techniques such as the co-integration test and the Durbin Watson (CRDW) method. He concluded that Okun's law is unreliable for Jordan because the lack of growth does not explain Jordan's unemployment problem.

Furthermore, Al-Eid and Bahadi (2012) used a simple regression model and annual data to investigate the probability of the presence of this partnership in the Palestinian territories from 1996 to 2011. The experimental findings revealed a poor reciprocal association between GDP development and the unemployment rate, with a one-unit rise in GDP leading to a 0.25 percent decrease in the annual growth rate of unemployment in the Palestinian territories overall, 2.05 percent in the West Bank, and 0.31 percent in Gaza.

Amassoma and Nwosa (2013) used the Johansen co-integration test and the error correction model (ECM) methodology to investigate the connection between Nigeria's unemployment rate and productivity development between 1986 and 2010. The stationarity test was performed using the Augmented Dickey-Fuller (ADF) and Phillips-Perron unit root analyses, and the findings revealed that both variables were integrated in the same order at first difference. The Johansen co-integration test results showed that a long run equilibrium relationship existed between the variables under consideration.

Keller and Nabil (2002) found that economic growth in MENA countries was insufficient in comparison to the region's labor force, and that high growth does not guarantee good labor market outcomes.

While Juda and Esa (2010) were attempting to estimate the Okun coefficient in the short and long term in Iraq, the analysis results revealed that the unemployment rate is insensitive to changes in GDP, and the correlation coefficient between the two variables is weaker due to Iraq's employment policy, and thus it is inappropriate with its economic policies. As a result, this law is insufficient for Iraq.

Freeman (2001) tested Okun's law for ten industrial countries (the United States, the United Kingdom, Japan, Canada, Germany, Italy, France, the Netherlands, Sweden, and Australia), including new developments with trend decomposition, and discovered that Okun's coefficient, which was originally three points, is now only less than two points of GDP growth for every one percent change in unemployment rate for selected countries.

Al-Ghannam (2003) used the co-integration test and error correction model to analyze the relationship between the rate of economic growth and employment in Saudi private enterprises. According to Granger, causality resulted in the existence of a long-term balancing relationship between the employment rate and economic growth, as well as the existence of a causal relationship only in one direction from the rate of economic growth to employment, rather than vice versa.

Al-Habees and Abu Rumman (2012) investigated this relationship in the Jordanian and Arab economies. They discovered a very positive trend for high growth rates and a relative decrease in the unemployment rate, but this does not prove the existence of a strong relationship. Irfan et al. (2010) used annual data from 1980 to 2006 to examine the validity of Okun's law in several Asian countries. They discovered that Okun's Law does not apply in some Asian developing countries.

Zagler (2006) demonstrated a significant and negative relationship between unemployment and economic growth in the United Kingdom using microeconomic evidence and fixed-effect regression methods. Furthermore, using Nigerian data from 2000 to 2008, Oye and Inuwa (2011) demonstrated that unemployment has a significant (over 65 percent) effect on the realization of Nigerian GDP, that there is an inverse relationship between unemployment and GDP, and that any increase in unemployment leads to a decrease in GDP and vice versa.

Ritsakis and Stamatiou (2016) applied the (ARDL) and ECMARDL models to annual data for Greece from 1995 to 2015. They demonstrated that there is a unidirectional causal relationship between unemployment and economic growth, with the direction of the relationship being from unemployment to economic growth. Tiryaki and Ozkan (2011) examined quarterly data from Turkey from 1998 to 2010 and discovered one-way causality ranging from the GDP gap to unemployment.



Yousefat (2011) studied the Algerian economy from 1970 to 2009, employing the correlation matrix, casual and test, simultaneous integration methodology, and error correction model. The findings revealed the existence of a slight and inverse causal relationship between unemployment and economic growth, as well as the absence of a long or short-term balancing relationship between unemployment and economic growth rates, while the causality test revealed the existence of a causal relationship in one direction from unemployment to growth.

In general, most research, especially in developing countries, affirm Okun's (1962) relationship to measure the association between the product and the unemployment rate, but the findings vary from country to country and over time depending on the nature of economic growth achieved in each state. Revenge and Beutalia; 1995, Lee; 2000, Sogner & Stiassny; 2002, Harris & Silverstone; 2001, Zagler; 2003, Yerdelen; 2011, Ivan & Oleg; u.d.

## DATA AND METHODOLOGY

The report used annual statistical statistics gathered from the Central Bank of Liberia (CBL) statistical bulletin and the world development indicators (world bank data) on the unemployment rate and economic growth rate of Liberia from 2001 to 2019.

Thus, this analysis captured economic growth as GDP growth (% annual) and unemployment as the rate of unemployed labor force in comparison to the country's labor force. As a result, the analysis would take into account two variables: unemployment and economic growth (GDP).

### Descriptive statistics variables

Descriptive statistics	Liberia GDP per annual	Liberia unemployment total (labour force)
Mean	2.419872	2.381053
Medium	3.763018	2.270000
Maximum	9.535280	3.080000
Minimum	-30.14513	2.080000
Std. Dev.	8.659118	0.326325
Skewness	-2.933281	1.277449
Kurtosis	11.82255	2.980702
Jarque-Bera	88.86770	5.167905
Probability	0.000000	0.075475
Sum	45.97756	45.24000
Sum Sq. Dev.	1349.646	1.916779
Observation	19	19

Table (2)

## Model Specification

The Okun's (1962) style model was used in this analysis, although it was updated to have unemployment as the independent variable and economic growth as the dependent variable, as measured by real GDP. The Okun's Law is a simplified variant of the Philips curve that assumes an inverse association between GDP growth and unemployment.

RGDP = f (Unemp...) is the model's formula (1)

Therefore,  $RGDP = \beta_1 + \beta_2 Unemp + \mu$

- Where GDP- denotes the rate of GDP growth (Economic Growth)
- Unemp- denotes the unemployment rate;
- $\beta_1, \beta_2$  - are the parameters
- $\mu$ - is the error term

The stability properties of the variables used were first investigated in order to approximate equation 1. The Augmented Dickey-Fuller (ADF) and Philips-Perron (PP) experiments were included in the analysis as two-unit root tests. The imperatives of contrast and accuracy influenced the selection of these measures. According to Hamilton (1994), the PP unit root test has higher reliability than the ADF since it is more resilient in the face of serial correlation and heteroscedasticity, though it has its own drawbacks. The research will also employ an unique estimation methodology known as bounds testing to assess for co-integration within an autoregressive distributive lag (ARDL) system suggested by Pesaran and colleagues (Pesaran 1997, Pesaran and Shin 1999 and Pesaran 2001). Because order of integration is no longer a concern, the ARDL may be used in this analysis regardless of whether the regressors are I(0) or I(1).

This study investigates a long-term relationship by analyzing an error-correction model with no predefined error rates. (UECM):  $\Delta LY_t = \alpha_1 + \alpha_2 T + \alpha_3 LY_{t-1} + \alpha_4 Unemp_{t-1} + \sum_{i=1}^p \alpha_i \Delta LY_{t-i} + \sum_{j=0}^q \alpha_j \Delta Unemp_{t-j} + \varepsilon_{1t}$  (3). Beginning by defining and calculating a general distributed lag model, the ARDL method entails co-integration among the variables as a justification for retaining lagged level variables in Equation 3.

When the independent variables are I(d) with  $0 < d < 1$ , two asymptotic critical value bounds offer a benchmark for cointegration. Both bounds presume that all the repressors are I(0). This test rejects the null hypothesis of no cointegration if the measured F-statistics is less than the lower bound critical value. When computing the F-statistics, if the measured F-statistics is greater than the upper bound critical value, then the null hypothesis is rejected, which implies that the variables in the model are in steady state equilibrium. To verify the ARDL result, the analysis examines the model's normalcy and homoskedasticity. Additional tests are often carried out to evaluate the stability of the parameters using the Cumulative Sum of Recursive Residuals (CUSUM) and the Cumulative Sum of Squares of Recursive Residuals (CUSUMSQ).



Findings of the study or empirical results

Table 3. Unit root test

Variable	Test	T- statistics	P- Value	T- statistics	P- Value	Order of integration
Level				1 <sup>st</sup> difference		
RGDP	ADF	-3.507009	0.0202	-6.252039	0.0001	1(0)
	P-P	-3.507009	0.0202	-8.847041	0.0000	1(0)
UNEMP	ADF	-1.945931	0.5898	-4.373733	0.0038	1(1)
	P-P	-1.953719	0.5859	-4.464993	0.0032	1(1)

The variables were subjected to the unit root test in table 3 to determine their stationarity at level and at first difference using Phillip Perron test statistics and the Augmented Dickey Fuller test (ADF). The unit root calculation reveals that the GDP growth rate is stationary at both the level and first difference, while the unemployment variables have unit root problems at I(0) and are rendered stationary at the first difference. Since the order of the integration variables is zero and one, we used the ARDL estimate test and the bounds test on the two variables to test for short and long run dynamism respectively. The results of the experiments reveal that there is no co-integration of both the short and long run. As a result, we reject the hypothesis at the 5%.

Table 4. Bounds test to co-integration

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
Asymptotic: n=1000				
F-statistic	2.255116	10%	3.02	3.51
k	1	5%	3.62	4.16
		2.5%	4.18	4.79
		1%	4.94	5.58

The findings of the ARDL bounds test and the approximate F-test show that there is no long-run association between variables. The decision rule is founded on the F-statistic (2.255116), which is less than the upper bound critical value of 4.16 at the 5% level of significance. As a result, we should not reject the null hypothesis that there is no co-integration.

Table 5. Short-Run ARDL

Variable	Coefficient	Std. error	t-statistic	Prob.***
C	97.50311	47.14150	2.068308	0.0934
UNEMP	-3.481241	3.660105	-0.951132	0.3852

Note: The ARDL estimate shows that there is no co-integration at the level of 5%

Table 4 depicts the short-run relationship between unemployment and economic growth using the estimated ARDL test. The dependent variable was GDP, while the independent variable was unemployment. The findings revealed that there is a negligible relationship between GDP growth and unemployment. This is why, when the country's unemployment rate rises by 1%, GDP growth falls by -3.43 percent.

Table 6. Long-Run ARDL

Variable	Coefficient	Std. error	t-statistic	Prob.***
C	121.7520	56.55583	2.152775	0.0840
UNEMPL	-52.61276	25.50423	-2062903	0.0941

The ARDL estimate shows that there is no co-integration at the level of 5%

According to the long run co-integration forecast, the unemployment rate has a negligible impact on export development in Liberia. This is evidenced by the country's growing pattern in both unemployment and real GDP growth. According to the findings, any 1% increase in unemployment increases GDP growth by -52.62 percent. The implication is that the economy's productivity performance is unaffected by the unemployment condition.

### Residual Diagnostic tests

Table 7.

Test	Null Hypothesis	Statistic value	Probability
Breush-Godfrey Serial correlation (LM) test	No serial correlation at up to 2 lags	0.058021	0.9438
Jarque-Bera (JB)	Residuals are not normally distributed	122.5921	0.000000
White (CH-sq)	No conditional heteroskedasticity	0.051481	0.8232

The results in Table 8 show that there is no serial correlation, no conditional heteroskedasticity and there is no normal distribution in the unemployment model.

### Conclusion

Using time series methods, this research aims to provide an analytical overview of the relationship between GDP and unemployment in Liberia from 2001 to 2019. In addition, the analysis presented an estimate of Okun's coefficient. According to Neely (2010), Okun's coefficients are lower in industrialized countries with less regulated labor markets. Because it is easier to lay off workers, unemployment is more sensitive to changes in output. "The Okun's coefficient can change over time because the relationship between unemployment and output growth is affected by laws, technology, preferences, social customs, and demographics," he adds. Our analytical research included the unit root test, Dickey-Fuller test, bounds cointegration test, and residual diagnostic test for the relationship between unemployment rate and economic development. The findings presented in this analysis demonstrated that the data series was stationary in terms of unit root variations at first difference. Cointegration tests showed that there is no cointegration connection between unemployment and economic development in Liberia in both the short and long - run. Despite positive growth rates in certain periods the Liberia economy has been unable to substantially decrease the unemployment rate. The biggest explanation is that the Liberian economy is based on capital intensity rather than labor intensity. As a consequence, it contributes little to the reduction in unemployment rates.

As a consequence, it contributes little to the reduction in unemployment rates. Increasing the job rate necessitates policies that encourage labor-intensive activities and sectors such as services, manufacturing, and agriculture.

It should be remembered that the report has flaws and drawbacks, the first of which is the limited number of findings owing to the scarcity of data on an annual basis, the second of which is that the time of civil crisis is not taken into account, and the third of which is that the analysis does not quantify the impact of labor market regulations. However, the findings of this analysis have especially significant policy consequences for Liberian economic policymakers, since this is the first attempt to empirically investigate the causal relation between these two variables using multiple regression models.

## **Recommendations**

In Liberia, achieving fast growth and creating quality jobs remains a problem. Economic growth is critical to lowering unemployment rates. However, in order to reach incredible growth rates that would benefit the country or economy and increase labour demand and respectable job creation, policymakers should develop policies that encourage and maintain rapid and sustainable economic growth.

To reduce unemployment, the report recommends that the Liberian government channel its investment into activities that explicitly or indirectly encourage job growth, such as upgrading healthcare services, infrastructure construction strategies, schooling, and employment-inducing projects.

Strengthening activities that aid in crime prevention will help Liberia gain a positive reputation as a secure investment destination for many investors (whether domestic or international), lowering unemployment rates.

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## Appendix

Time/ Year	Unemployment, total (% of total labor force) (modeled ILO estimate)	GDP growth (annual%)
Units	%	%
2001	2.31	2.92
2002	2.33	3.76
2003	2.33	-30.15
2004	2.30	2.62
2005	2.27	5.28
2006	2.19	8.04
2007	2.13	9.54
2008	2.11	7.15
2009	2.24	5.30
2010	2.27	6.10
2011	2.24	8.20
2012	2.21	7.99
2013	2.19	8.70
2014	2.13	0.70
2015	2.08	0.00
2016	3.08	-1.60
2017	3.00	2.47
2018	2.94	1.22
2019	2.89	-2.28
Average	2.38	2.42

Course: World Development Indicators (World Bank)