**GROWTH –YOUTH UNEMPLOYMENT NEXUS IN UPPER MIDDLE INCOME COUNTRIES IN SUB-SAHARAN AFRICA**

 **BY**

 IHENSEKHIEN Orobosa Abraham1 **Ph.D**

And

 AISIEN Leonard Nosa2 **Ph.D**

All correspondence shall be handled by Dr. Ihensekhien, Orobosa Abraham1

1. Department of Economics, Banking and Finance

 Benson Idahosa University, Benin City, Edo State, Nigeria

 **Email:** **oihensekhien@biu.edu.ng** **Phone:** +2348035843175

2. Department of Economics, Banking and Finance

 Benson Idahosa University, Benin City, Edo State, Nigeria

 Email: lasien@biu.edu.ng

**Growth-Youth Unemployment nexus in Upper-Middle-income Countries in Sub-Saharan Africa**

**Abstract**

*The issue concerning growth-youth unemployment nexus has not been verified with respect to upper middle-income countries (UMIC) in Sub-Saharan Africa (SSA). The importance of this paper is to ascertain the relationship between economic growth and youth unemployment based on panel and individual countries data in term of annual series data from 1991 to 2017. To achieve the objective of this paper, data were sourced from the World Bank development indicators, for GDP growth rate and youth unemployment rate. Several statistical and econometric tests were conducted, the results obtained revealed that the average GDP-growth rate was 6.36% while youth unemployment rate was 32.30% for UMIC in SSA. The individual countries statistics indicated that Gabon has the highest GDP-growth rate of 21.01% while the highest youth unemployment rate was in South Africa with 47.30%. The lowest GDP-growth rate was observed in South Africa while the lowest youth unemployment was observed in Equatorial Guinea with 11.69%. The empirical results indicated that there exists a long-run and positive relationship between the variables of GDP-growth rate and youth unemployment rate in UMIC in SSA and that Okun’s law is not applicable in these countries. Based on the results obtained statistically it revealed high rate of youth unemployment and low rate of GDP-growth within the period of study, hence this paper suggest that individual countries in the UMIC in SSA should implement youth employment scheme in order to reduce the level of unemployment with respect to this age cohort. Creation of jobs for youth will help to reduce the economic and social costs associated with youth unemployment especially in countries like South Arica, Namibia, Botswana and Gabon. The UMIC in SSA are encouraged to boost their level of economic activities through investment in order to stimulate employment of young-able body persons in UMIC in SSA.*

**Key Words: Economic growth, Youth unemployment, Upper middle-income countries, Sub-Saharan Africa, Okuns’s coefficient**

1. **Introduction**

The World Bank development indicators report for 2018 indicated that six countries in Sub-Saharan Africa were classified as upper middle income countries (UMIC). These countries are: Botswana, South Africa, Gabon, Namibia, Mauritius and Equatorial Guinea. Forty eight countries make up the Sub-Saharan Africa (SSA) region located south of the Saharan Desert (United Nations, 2011& World Bank, 2018).

Kamgnia (2006) observed the importance of the growth-unemployment nexus, stating that a strong and steady economic growth is needed to create more employment more than ever before. In line with this the United Nations (2015) in its 2030 Agenda for sustainable development goals (SDGs) encouraged countries to sustain per capita economic growth in accordance with national circumstances and, in particular, at least 7 percent gross domestic product growth per annum in the least developed countries; to achieve full productive employment and decent work for all women and men, including for young people and persons with disabilities, and equal pay for work of equal value.

With respect to SSA, empirical evidence on the relationship between growth and unemployment is rather weak in some of the countries. Hence, a lot of effort is needed in this area in order to achieve the goal of sustained economic growth and reduce the level of all forms of unemployment in 2030.

In SSA according to World Bank Development Indicator (WDI) (2018), only 12.5% of its total number belong to the upper middle income group in 2018 while in 2015 only one country was classified as a high-income, 12 countries were in the lower income and 23 were low income.

ILO (2017) indicated that the number of unemployed persons worldwide will hit over 201 million persons in 2017, with additional 2.7 million persons expected in 2018. The survey indicated that the third world countries, especially Africa is expected to be worst hit, where the number of the unemployed and poverty are high. The challenges of high unemployment rate and slow output growth are not only experienced it does occure in the developed countries as well. However, the developed countries over the years have adopted good economic and political policies to reduce the level of unemployment. Unemployment challenges generally does not only constitute a high private cost for the individual, it is a huge cost to the government (Sachis-i-Marco, 2011; Abel, Bernanke & Croushore, 2008; Ihensekhien & Ovenseri-Ogbomo, 2017).

Below are some basic economic facts of the upper middle in countries of SSA: Botswana is ranked as the 2nd among forty eight of SSA with high income, it has a population of 2.2 million people with an average GDP growth rate of 4.52%, average youth unemployment rate of 33.29%, inflation rate of 2.8%. Equatorial Guinea has a population of 1,324,762 million people with an average GDP growth rate of 20.19, average youth unemployment rate of 11.69%, a median age of 22.2 years and her life expectancy at birth is 57.68. Gabon has a population of 1.5 million, inflation rate of -0.01%, average youth unemployment rate of 37.38%, crime index of 47.69 and safety index of 52.3 and GDP growth rate of 21.0%. Mauritius is made up of a population of 1.3 million with average GDP growth rate of 4.03 %, average youth unemployment rate of 22.47% and inflation rate of 1.0%. Namibia has a mean youth unemployment rate of 41.38%, inflation rate of 6.5%, a human population of 2.3million and GDP growth of 4.52%. South Africa is the second largest economy in SSA; it is an industrialized economy, with a population of 55.9 million, an average youth unemployment rate of 47.30 %, inflation rate of 6.3% and a mean GDP growth rate of 2.13%. South Africa has a safety index of 23.37 that is considered low but with a high quality of life index of 135.57 (World Bank, 2018).

The economic conditions of the upper middle income countries in SSA are likely to be marred with high incidence of crimes, poverty, and low quality of life, severe economic and social costs of all kinds that are associated with high rate of youth unemployment. However, the empirical study of Okun’s has been verified in many countries, but this has not been examined in UMIC in SSA based on the recent classification of countries into income group by the World Bank (2018) with respect to youth unemployment and growth. Therefore, there seems to exists a gap in literature with respect to the nexus between changes in youth unemployment and growth in UMIC in SSA. A study in this direction is significant in that it helps to ascertain the nature of economic growth and specially, it will help to establish whether or not the growth in SSA is inclusive. Therefor, the objective of the study is to evaluate the empirical nexus between youth unemployment and economic growth in UMIC in SSA and to ascertain the levelof influence of youth unemployment on growth, using annual time series data for the period 1991-2017.

The timeframe of the paper covers a period of 1991-2017. The paper is therefore divided into the following sections: section ( i) is the introduction, review of literature and theoretical issues is in section (ii), section (iii) contains the methodology applied, section (iv) is the analyses of results and section (v) contains the conclusion

1. **Review of Literature and Theoretical Issues**

The theoretical connection between economic growth and unemployment began with the works of Harrod (1939), Domar (1947) and Solow (1956) in their investigation of the issue of the long-run unemployment and how it influences the level of economic growth. The extension of the Keynesian model could be found in the studies of Okun (19962). Theoretically Okun’s law establishes the linkages between economic growth rate and unemployment rate, which he ascertained empirically to be negative. Okun’s law is seen as a benchmark for determining the economic well-being of a country.

 Okun (1962) in his study based on quarterly data of the USA from 1947-1957, he observed that there exist an inverse relationship between economic growth and unemployment rate. Specifically, he found that a 1% reduction in the unemployment rate would result in about 3% increase in economic growth. This empirical study became known as Okun’s law which continued to be verified in different forms in different countries. The Okun’s coefficient is seen as a useful “rule of thumb” in predicting as well as in policy investigation in term of economic growth and employment level.

The discovery of a strong empirical relationship between output growth (economic growth rate) and changes in the unemployment rate as postulated by Okun’s seminal paper of 1962 has become one of the most consistent relationship in macroeconomics (Adachi, 2007).

The theoretical linkage between economic growth and unemployment rate could be traced to several schools of economic thought. The classical economist’s school of thought believed that the connection between economic growth and unemployment is a one-way linkage that exists between the inputs of labour to economic growth. Kaldor (1967) as cited in Obadan and Odusola (2000) in invoking the Verdoorn’s law states that faster growth of output is responsible for a faster growth of productivity. The positive relationship that exists between employment and economic growth was also confirmed by Dernburg and McDougall (1985). Also from the view of the classical economists referring to Cobb-Douglas production function based on the technical links between output and the inputs such as labour and capital. The model indicated that the level of labour force assuming other variable is assumed to be constant help to determine the growth rate of output with other variable held constant.

 From the Keynesian economists’ angle, the issue of output and unemployment is explained in terms of aggregate demand. The Keynesians believed that the demand for labour is a case of derived demand. The Keynesian theoretical linkages of economic growth and unemployment as analyzed by Hussain and Nadol (1997), Thirlwal (1997) and Grill and Zanalda (1995) implies that increase in employment, technological change and investment are largely endogenous.

In a nut-shell, the growth of employment/unemployment is the determinants of long term increase/decrease in economic growth of a country.

**Table of Summary of empirical evidence on the relationship between growth rate and unemployment rate and the methodology adopted.**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **S/N** | **Names of Authors and year of studies** | **No. of Countries** | **Period**  | **Dependent variable(s)** | **Independent****variable(s)** | **Methodology** | **Okun’s Coefficient****Obtained** |
| 1 | Prachowny (1993) | 1(United States) | 1975Q1-1988Q4 | Output growth gap | Capacity utilization gap, unemployment gap Labour-supply gap and hours gap | OLS(first difference and production method) | -0.62 and -0.67 |
| 2 | Weber (1995) | 1(United states) | 1948Q1-1988Q4 | Unemployment gap and output gap | Output gap and unemployment gap | OLS,ARDL, VAR and rolling OLS  | -0.32, -0.22 and -0.26 |
| 3 | Moosa (1997) | 7(United States, France, Japan,United Kingdom, Canada, Italy and Germany) | 1960-1995 | Unemployment gap | Lagged unemployment gap and output gap | OLS ,rolling OLS and SUR | -0.49 and -0.09 |
| 4 | Lee(2000) | 16 OECD countries and Germany | 1955-1999, 1960-2006 |  Output gap | Unemployment gap | Panel least squares(PLS)(first difference and HP filter  | -0.22 |
| 5 | Harris & Silverstone(2001) | 6( Canada, Japan, US, ,Australia, New Zealandand UK) | 1978Q1-1998Q3 | Unemployment rate | Output rate | ECM(first difference) | -0.09 and -0.5 |
| 6 | Geldenhuys & Marinkov (2007) | 1( South Africa) | 1970-2005 | Output gap | Unemployment gap | HP , BN and BP filters  | -0.24, -1.09, -0.17 and -0.78 |
| 7 | Amassoma & Nwosa (2013) | 1(Nigeria) | 1986-2010 | Productivity growth | Unemployment, labour force, capital, inflation and government expenditure | Co integration and ECM | 1.12 and 1.35 |
| 8 | Akeju & Olanipekun (2014) | 1(Nigeria) |  1980-2012 | Unemployment gap | Output gap | Co integration and ECM | 0.097 and 0.069 |
| 9 | Adachi (2007) | 2( Japan and US) | 1969-2000 | Output | unemployment | OLS(first difference) | -6.18 and -1.81 |
| 10 | Tombolo & Hasegawa (2014) | 1(Brazil) | 1980Q1-2013Q3 | Unemployment | Output | OLS (first difference ) | -0.1878 -0.2055 |
| 11 | Kargi (2013) | 34 OECD countries | 1987- 2012 | Unemployment | Output | OLS(first difference) | -0.27 |
| **S/N** | **Names of Authors and year of studies** | **No. of Countries** | **Period**  | **Dependent variable(s)** | **Independent****variable(s)** | **Methodology** | **Okun’s Coefficient****Obtained** |
| 12 | Boulton (2010) | 10(eastern European countries)Poland, Romania, Slovakia,Slovenia,Bulgaria, Czech Republic, Hungary,Latvia and Lithuania | 1991-2008 | Real GDP | Unemployment | OLS (first difference) | 0.83, -4.2, -3.44, -4.54, 2.71,0.26,-5.44,1.87and -2.74 |
| 13 | Madito & Khumalo (2014) | 1(South Africa) | 1967Q1-2013Q4 | Economic growth rate | Unemployment rate | VECM(first difference) | -0.618 |
| 14 | Ho(2002) | 1(Macau) | 1993-2001 | Output | Unemployment | OLS(first difference) | -1.6951 |
| 15 | Andrei (2009) | 1(Romania) | 24Q000Q1-2008 | Output gap  | Unemployment gap | OLS | -0.493 |
| 16 | Hutengs & Stadtmann (2012) | Euro zone |  | Unemployment | GDP | OLS(first difference | -0.034, -0.91, -0.75 and -0.234 |
| 18 | Zanin & Marra (2012) | 9 (Spain, Portugal, The Netherlands, Italy, Ireland, Greece, Finland, Austria and France | 1996-2009 |  Unemployment | Real GDP growth  | OLS and rolling OLS(first difference) | -0.34, -0.14, -0.19,-0.05,-0.31,-0.07,-0.12, -0.32 and-0.10 |
| 19 | Barreto & Howland (1993) | 1(Japan) | 1953-1982 | UnemploymentOutput | OutputUnemployment | OLS(first difference) | -0.032-9.46 |
| 20 |  Tatoglu (2011) | 19 European countries | 1977-2008 | UnemploymentOutput | OutputUnemployment | Panel co integration and Panel ECM | 0.003,0.007,-0.087,-0.075 |
| 21 | Ozel & Sezgin (2013) | 7{Industrial countries(G7)} | 2000-2011 | Unemployment rate | Growth rate and Productivity | Panel least squares, Fixed and Random effects | -0.351,-0.250 |
| 22 | Khemraji ; Madrick & Semmler (2006) | 4(US, France, UK and Germany | 1961-2000 | Output | Unemployment | OLS(first difference) | -9.83,-3.12,-4.36,-5.67 |
| 23 | Elshamy (2013) | 1(Egypt) | 1970-2010 | Output | Unemployment | OLS,ECM(Gap model) | -0.021 |
| 24 | Salman (2012) | 1(Sweden) | 1993Q1-2011Q2 | GDP growth rate | Total unemployment, Female and male unemployment | OLS(first difference) | -0.076,-0.084,-0.079 |
| 25 | Ihensekhien (2016) | 42(SSA countries) | 1991-2013 | Unemployment | GDP growth rate | Panel Least Squares and OLS | -0.049 |
| 26 | Ihensekhien & Erhi (2016) | Nigeria | 1991-2015 | GDP growth rate  | Total unemployment rate, Youth unemployment rate, Male unemployment rate and Female unemployment rate | OLS | 53.45104126.2314.03 |
| 27 | Ihensekhien & Asekome (2017) | 23(Low income countries in SSA) | 1991-2013 | Youth unemployment rate | GDP growth rate | Panel Least Squares and OLS | -0.171 |
| 28 | Ihensekhien& Ovenseri-Ogbomo (2017) | 23 (Low income countries in SSA) | 1991-2013 | Total unemployment rate  | GDP growth rate | Panel Least squares and OLS |  -0.075 |
| 29 | Mojica, & Tatlonghari, (2017)  | Philippines economy  | 1990Q3-2014Q3, 1990Q3-2005Q3, 2005Q3-2014Q | Unemployment rate | GDP growth rate | OLS | -0.85 -0.92 -0.70  |
| 30 | Ihensekhien & Aisien (2018) | 6 (upper middle income countries in SSA | 1991-2017 | Unemployment rate | GDP growth rate | Panel least squares and OLS | -0.142, -0.135,-0.131,-0.127,-0.120,-0.113,-0.071 |

**Source**: Author’s Compilation (2019)

**III. Methodology Applied**

This paper employed the use of annual data series for a cross-section of six countries categorized as UMIC in SSA by the World Bank development indicators for 2018. A quasi-experiment research design was used to ascertain the variation in dependent variable due to change in the independent variable. The study covered a period of 1991 to 2017 based on youth unemployment and GDP-growth rates to verify whether Okun’s law exists in the UMIC in SSA.

 Several statistical and empirical analyses were conducted to ascertain whether Okun’s law is applicable in the UMIC in SSA in terms GDP growth- youth unemployment nexus. Unit root test, Co-integration, Granger causality, Panel least squares (PLS) and Ordinary least squares (OLS) analyses were conducted. Descriptive statistics were also computed to explain the distributional data employed.

*Unit Root Test*

Unit root analyses by Dickey and Fuller (1979) was applied to determine whether there exist unit root problem that will lead to spurious results. A variable is considered to have a unit root, when at first difference if the ADF critical value is higher than the time value (critical values at eitherat (1%, 5% or more). The equation for the test is represented as:  (1)

Where: YUE = youth unemployment variable under consideration

 t = a linear time trend

  = the first difference operator

  = refers to the constant

 = the time lags and  refers to the white noise

The second variable used in the unit root test is given as:

 (2)

Where: GGR = GDP growth variable under consideration

 t = a linear time trend

  = the first difference operator

  = refers to the constant

 = the time lags and  refers to the white noise

*Co-integration Test*

Co-integration test is to determine whether the variables employed in the analysis have long-run relationship ((Granger, 1981), (Johansen, 1988), and (Johansen & Juselius, 1990)). The co-integration equation is represented as:  (3)

Where:  is an  vector of variables that are integrated of order indicated 1(0), 1(1) or 1(2) etc.  is an  vector innovations. The above equation (3) can be respecified as:  (4)

*Granger Causality Test*

The direction of effect between two variables is ascertained by Granger causality test. The result obtained from the test could be bidirectional, unidirectional and independence causality. In this paper the test was done for growth and youth unemployment in terms of cross-section and individual countries basis. The equation for Granger causality is estimated as follows:  (5)

*Model Specification*

The paper adopted the first difference form of equation of Okun’s. The equation for this paper is represented as:  (6)

The cross section form of equation (6) is written as:  (7)

Where = 1, 2, 3, 4 - - - m, countries.

t = 1, 2, 3, - - - n, years.

 Where: YUEi, t = the observed youth unemployment rate of countries i.

  = the GDP growth rate of UMIC in SSA.

  = the intercept, which indicates the average output growth of full-employment output (potential output).  = the Okun’s coefficient, which was estimated by Okun to be negative (β<0).

The term  shows the variation in changes in output growth rate as a result of a unit change in unemployment rate.

 = stochastic error term (white noise). Variables not considered specification error and inherent randomness in human attributes (Hilmer *&* Hilmer, 2014).

**IV. Analyses of Results**

**Table 1: Descriptive Statistics for Upper Middle Income Countries in SSA**

|  |  |  |
| --- | --- | --- |
|  | ***GGR*** | ***YUE*** |
| Mean | 6.36 | 32.30 |
| Median | 3.93 | 35.66 |
| Maximum | 149.97 | 54.83 |
| Minimum | -9.09 | 11.23 |
| Standard Deviation | 14.56 | 12.44 |
| Skewness | 6.89 | -0.35 |
| Kurtosis | 62.76 | 2.07 |
| Jarque-Beta | 25391.74 | 9.39 |
| Probability | 0.0000 | 0.0000 |
| Number of Observations | 162 | 162 |
| Number of Countries | 6 | 6 |

**Source:** Author’s Estimation Result (2019)

**Table 2: Individual Descriptive Statistics for Upper Middle Income Countries in SSA: Youth unemployment variable**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| country | mean | median | maximum | minimum | Std.Dev | skewness | Kurtosis | Jarque Beta | Obs. |
| Botswana | 33.92 | 35.16 | 43.47 | 24.19 | 4.59 | -0.25 | 2.73 | 0.35 | 26 |
| Gabon | 37.38 | 36.01 | 42.17 | 34.96 | 2.63 | 0.93 | 2.35 | 4.22 | 26 |
| South Africa | 47.30 | 49.04 | 54.83 | 32.19 | 5.79 | -1.06 | 3.26 | 4.90 | 26 |
| Namibia | 41.38 | 41.56 | 46.62 | 34.32 | 3.50 | -0.20 | 1.91 | 1.47 | 26 |
| Mauritius | 22.47 | 23.15 | 26.00 | 17.86 | 2.24 | -0.45 | 2.33 | 1.37 | 26 |
| Equatorial Guinea | 11.69 | 11.53 | 14.16 | 11.23 | 0.59 | 3.08 | 12.99 | 1.49 | 26 |

**Source:** Author’s Estimation Result (2019)

**Table 3: Individual Descriptive Statistics for Upper Middle Income Countries in SSA: GDP growth variable**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| country | mean | median | maximum | minimum | Std.Dev | skewness | Kurtosis | Jarque Beta | Obs. |
| Botswana | 4.52 | 4.56 | 11.34 | -7.65 | 3.91 | -0.98 | 4.75 | 7.80 | 26 |
| Gabon | 21.01 | 15.98 | 149.97 | -9.09 | 32.34 | 2.65 | 10.93 | 98.68 | 26 |
| South Africa | 2.13 | 3.08 | 7.09 | -8.93 | 3.79 | -1.05 | 3.94 | 5.73 | 26 |
| Namibia | 4.52 | 4.11 | 9.03 | 1.24 | 1.80 | 0.73 | 3.51 | 2.60 | 26 |
| Mauritius | 4.03 | 4.06 | 12.27 | -1.58 | 2.91 | 0.43 | 3.97 | 1.80 | 26 |
| Equatorial Guinea | 2.59 | 2.85 | 5.60 | -2.14 | 1.90 | -0.68 | 3.40 | 2.15 | 26 |

**Source:** Author’s Estimation Result (2019)

The results in table 1 shows the descriptive statistics for six UMIC in SSA that indicated that within the period of study that the average youth unemployment rate stood at 32.30% and that of the mean value of GDP growth rate was 6.36% . A comparison of the cross section means with that of the individual countries mean revealed that South Africa had a mean value of 47.30%, Namibia (41.38%) Botswana (33.92%), and Gabon (37.38%) that were observed to higher than the mean for youth unemployment for cross section in UMIC in SSA. However, Equatorial Guinea had the lowest youth unemployment rate of 11.69% on average as shown in table 2.

A look at the average GDP growth rate indicated that Gabon had a mean value of 21.01% which was observed to be greater than the mean value for cross section of UMIC in SSA of 6.36% while had the lowest mean value of 2.13% within the group. In general the mean value for group of UMIC in SSA of 6.36% for GDP growth was observed to be greater than the following countries mean values such as: Botswana (4.52%), South Africa (2.13%), Namibia (4.52%), Mauritius (4.03%) and Equatorial Guinea (2.59%) as shown in table 3.

**Table 4: Correlation Matrix for 6 Upper Middle-Income Countries in SSA (1991-2017)**

|  |  |  |
| --- | --- | --- |
|   | *YUE* | *GGR* |
| *YUE* | 1 | 0.11 |
| *GGR* | 0.11 | 1 |

**Source:** Author’s Correlation Result (2019)

Based on the correlation matrix results presented in Table 4 indicates correlation among the variables. Not as expected, the youth unemployment and GDP growth rate variables revealed a positive relationship which therefore shows that there exist positive link between youth unemployment rate and GDP growth rate in UMIC in SSA and this contrary to Okun’s law (1962).

 **Table 5: Results of Panel Unit Root Tests**

|  |  |  |
| --- | --- | --- |
| **Method (At levels)** | ***GGR*** | ***YUE*** |
| Levin, Lin & Chut\*\*  | -5.33(0.000)\* | -0.736(0.231) |
| Im, Pesaran and Shin W-Star | -5.38(0.000)\* | -1.065(0.143) |
| ADF-Fisher Chi-Square | 51.39(0.000)\* | 15.159(0.233) |
| PP-Fisher Chi-Square | 89.70(0.000)\* | 21.681(0.041)\*\* |
| **Method (At first difference)** | ***GGR*** | ***YUE*** |
| Levin, Lin & Chut\*\*  |  | -2.495(0.001)\*\* |
| Im, Pesaran and Shin W-Star |  | -3.431(0.000)\* |
| ADF-Fisher Chi-Square |  | 34.073(0.000)\* |
| PP-Fisher Chi-Square |  | 90.580(0.000)\* |

Author’s Estimation Result (2019)

\*&\*\* represents significance at 1% & 5% level respectively.

Where: YUE = youth unemployment, GGR= GDP growth

The result in table 5 indicates that t-statistic values obtained in the unit root test for a cross section of UMIC in SSA were all found to significant as shown in the table confirmed by the probability values in parentheses. The GGR was observed to be statically significant at levels indicating that there no unit root problem hence it was stationary, however, that of YUE did not passed the test at levels but was found to be statistically significant and stationary at first difference as shown in table 5. The unit root result therefore indicated that the variables are free from the problem of spuriousity and that the variables could be used for further empirical analyses hence, the null hypothesis of the presence of non stationarity in the panel data series is rejected.

**Co-integration Test Result**

**Table 6: Johansen Co-integration Test Result (Panel co-integration) Series: YUE, GGR**

|  |
| --- |
| No deterministic Trend |
| Eigen value | Trace statistic | Critical value (0.05) | Prob. |
| 0.562 | 20.70\* | 12.32 | 0.002 |
| Linear deterministic Trend |
| Eigen value | Trace statistic | Critical value (0.05) | Prob. |
| 0.562 | 29.47\* | 15.50 | 0.000 |

Author’s Estimation Result (2019)

**Table 7: Co-integration Test Result (Individual Countries) Series: YUE, GGR**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Country | HypothesizedNo. of CE(s) | Eigen value | Trace Statistic | Critical value (0.05) | Prob. |
| Botswana  | None\*At most 1\* | 0.5620.297 | 29.48\*8.81\* | 15.503.34 | 0.0000.003 |
| Gabon  | None\*At most 1\* | 0.5140.410 | 29.97\*12.67\* | 15.503.34 | 0.0000.000 |
| South Africa  | None\*At most 1\* | 0.2840.131 | 11.383.37 | 15.503.34 | 0.1890.670 |
| Namibia  | None\*At most 1\* | 0.3910.132 | 15.273.38 | 15.503.34 | 0.5400.660 |
| Mauritius  | None\*At most 1\* | 0.3540.132  | 13.012.51 | 15.503.34 | 0.1150.113 |
| Equatorial Guinea | None\*At most 1\* | 0.4270.098 | 15.86\*2.49 | 15.503.34 | 0.0440.015 |

Author’s Estimation Result (2019) **\***significant at 5% level**.**

The result in table 6 indicated that at the 5% probability level, that there exists co-integration among the panel data used and that there exists a long-run relationship between variables used in the model. The individual countries result as shown in table 7 however indicated some deviation in some countries such as South Africa, Namibia and Mauritius where the null hypothesis of no co-integration is accepted while this was not so in Botswana, Gabon and Equatorial Guinea where it was observed that co-integration exist on individual country basis.

**Granger Causality Test Result**

**Table 8: Pair wise Granger causality Test Result**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Categories of countries | Null Hypothesis | Observation | F-statistic | Prob. |
| Six UMIC in SSA | YUE does not Granger cause GGR | 150 | 0.3360.600 | 0.7150.550 |
| Botswana  | YUE does not Granger cause GGR | 24 | 0.2630.951 | 0.7710.404 |
| Gabon  | YUE does not Granger cause GGR | 24 | 1.6983.538\* | 0.2090.049 |
| South Africa  | YUE does not Granger cause GGR | 24 | 0.1300.177 | 0.8790.839 |
| Namibia  | YUE does not Granger cause GGR | 24 | 0.6630.004 | 0.9390.997 |
| Mauritius  | YUE does not Granger cause GGR | 24 | 0.1081.161 | 0.8980.334 |
| Equatorial Guinea | YUE does not Granger cause GGR | 24 | 1.9110.532 | 0.1750.596 |

Author’s Estimation Result (2019) **\***significant at 10% level**.**

In order to ascertain the direction of the effect between youth unemployment and GDP growth rates, the pair wise Granger causality test was conducted and verified at both 5% and 10% levels of significant. The result obtained in table 8 indicated that there is no causality between variables used except only in Gabon that indicated a unidirectional causality between YUE and GGR, meaning that GGR Granger causes youth unemployment. In general the overall Granger causality result indicated a case of independence in causality that YUE does not Granger cause GGR and vice versa.

**Table 9: Panel Least Squares (PLS) and Ordinary Least Squares (OLS) Estimation Result for UMIC in SSA. Youth unemployment rate (YUE) as the dependent variable and GDP growth rate (GGR) as the independent variable.**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Category of Countries | *Average GGR* | *Average YUE* | (Okun’s coefficient) | Std. error | t-statistic | Prob.Value |
| 6 UMIC in SSA | 6.36 | 32.30 | 0.897 | 0.157 | 5.71 | 0.000\* |
| Botswana  | 4.52 | 33.29 | 4.329 | 0.747 | 5.80 | 0.000\* |
| Gabon  | 21.01 | 37.38 | 0.564 | 0.162 | 3.38 | 0.002\*\* |
| South Africa  | 2.13 | 47.30 | 5.560 | 1.861 | 2.99 | 0.006\*\* |
| Namibia  | 4.52 | 41.38 | 7.943 | 0.621 | 12.791 | 0.000\* |
| Mauritius  | 4.03 | 22.47 | 3.697 | 0.482 | 7.670 | 0.000\* |
| Equatorial Guinea | 2.59 | 11.69 | 2.960 | 0.435 | 6.805 | 0.000\* |

**Source:** Author’s Estimation Results (2019)

\*/\*\* represents significance at 5% and 10% levels.

The PLS and OLS estimation result for UMIC in SSA based on the first difference model of Okun’s to ascertain whether Okun’s is applicable in the UMIC in SSA based on Growth-Youth unemployment nexus, the result indicated in table 9 revealed a contrary case which indicated a positive relationship instead of the negative relationship ascertained by Okun (1962). The t-statistic values for both PLS and OLS cases were found to be statistically significant hence this result indicated that Okun’s relation does not exist in terms of the growth-youth unemployment nexus in UMIC in SSA within the period of study. The above result also confirmed the previous result for the relationship between total unemployment and output growth in UMIC in SSA in countries such as South Africa, Equatorial Guinea, Gabon and Mauritius within the period of 1991 to 2017 (Ihensekhien and Aisien, 2018). The result obtained agreed with the arguments of Davis and Haltiwanger (1992), Saint-Paul (1993), Bean and Pissarides (1993), Ihensekhien (2016), Ihensekhien and Erhi (2016) and Ihensekhien and Asekome (2017).

Aghion and Howitt (1994) indicated that the case of either positive or negative outcome between unemployment variable and growth variable is as results of high rates of growth are negatively correlated with unemployment while low rates of growth are positively correlated with unemployment. The positive correlation between youth unemployment and growth in UMIC in SSA is due to the high rate of youth unemployment figures in these countries compared to the low rate of GDP growth within the period of study.

The implication of the above findings is that economic growth experienced in the selected countries does translate into employment generation activities. This shows that the growth is a non-incusive growth in terms of youth population. The findings revealed that the economic is not labour intensive which resulted in the high level of youth unemployment as high as 47.30 in South Africa and the mean rate of youth unemployment in UMIC in SSA was 32.30. It is a sign of an economy under experiencing high level of discomfort as a result of social vices due youth unemployment. The result also indicated that young able-body persons in these countries are likely to be vulnerable to the threat of hunger, poverty and low human capital development, When the situation is not corrected and resolved on time this might result in social threats/crisis which would result in huge economic cost on the economy of the UMIC in SSA.

**V. Conclusion**

The paper examined the growth-youth unemployment nexus in UMIC in SSA. The timeframe was from 1991 to 2017 based on six countries in the upper middle income categories in SSA. The objectives of the study were to determine the relationship between GDP growth and youth unemployment as well as to ascertain the influence of youth unemployment on growth in terms of a cross section of countries and individual country analyses.

To achieve the set objectives, several statistical and empirical tests were conducted, such as descriptive statistics, unit root test, co-integration test, Granger causality test, Panel and Ordinary Least Squares. The result obtained were quite revealing indicating that there exist a long-run relationship between the variables used and that Okun’s law is not applicable in UMIC in SSA. The average values for youth unemployment and GDP growth rates varies a cross countries within the group and that the highest youth unemployment within the period was observed in South Africa (47.30%) while that of the group average was 32.30%.

The paper therefore concludes that there is high rate of youth unemployment and low rate of GDP growth in UMIC in SSA within the period and that Okun’s relation is not applicable in terms of the variables of youth unemployment and GDP growth.

Based on the statistical and empirical findings of this paper, it is therefore recommended that individual countries in the category of upper middle income countries in SSA should establish youth employment scheme for all categories of employment with the aid of the private sector especially in countries with high incidence of youth unemployment such as South Africa, Namibia and Gabon. The governments of these countries concerned are encouraged to boost their level of economic activities in order to stimulate investment that will create more jobs.

**References**

Abel, A.B., Bernanke, B.S., & Croushore, D., (2008). *Macroeconomics*. Boston: Pearson

 Education Inc.

Adachi, H., (2007). Economic Growth and Unemployment: Theoretical Foundations of Okun’s Law. *Review of Economics and Statistics*.

Akeju, K.F., & Olanipekun, D.B., (2014). Unemployment and Economic Growth in Nigeria. *Journal of Economic and Sustainable Development*, 5(4), 138-144.

Amossoma, D., & Nwosa, P.I., (2013). The impact of unemployment rate in productivity growth in Nigeria: An error correction modeling approach. *International Journal of Economics and Management Sciences*. 2(28), 1-13.

Barreto, H., & Howland, F. (1993), “there are two Okun’s law relationships between output and unemployment”. Working paper, Wabash College.

Bean, C., & Pissarides, C., (1993). Unemployment, Consumption and Growth, *European Economic Review*, 37, 837-854.

Boultom, T., (2010). Test of Okun’s Law for the 10 Eastern European Countries, London Metropolitan Business School, and Economics Subject Group.

Davis, S.J., & Haltiwangerk, J., (1993). “Gross Job Creation, Distribution and Employment Reallocatio, “Quarterly *Journal of Economics,* 107, 819-864.

Derngurg, T.F., & McDougall, D.M. (1985). Macroeconomics, 7 Ed. New York: McGrew Hill.

Dickey, D.A. & Fuller, W.A., (1997). Distribution of the estimators for autoregressive time series wth a unit root. Journal of the American Statistical Association, 74:427-431.

Elshamy, H. (2013). Okun’s law and its validity in Egypt. *Journal of Emerging Issues in Economics, Finance and Banking*, Vol.1 No.2

Geidenhuys, J., & Marinkov, M., (2007). Robust Estimates of Okun’s Coefficient for South Africa. Working Paper Number 55. Department of Economics, University of the Frees State 1-18.

Hilmer, C.E. & Hilmer, M.J. (2014). *Practical Econometrics (Data Collection, Analysis and Application)*. McGraw-Hill International Edition, New York.

Ihensekhien O.A & Erhi M.A (2016). Economic growth and unemployment categories: Evidence from Nigeria. West African Social and Management Sciences Review (WASMSR) Vol. 7:1- 24.

Ihensekhien, O.A & Aisien, L.N (2018) Unemployment and Output growth: Evidence from Upper Middle-income countries in Sub-Saharan Africa. American Economic &Social Review: Vol.3. No.1: 32-43.

Ihensekhien, O.A & Asekome, M.O (2017) Youth unemployment and economic growth: Lesson from Low-income countries in Sub-Saharan Africa. European Journal of Economics, Law and Politics (ELP), Vol. 4, No.2:1-15.

Ihensekhien, O.A (2016). A cross country empirical analysis of the relationship between Economic growth and Unemployment in Sub-Saharan Africa, An unpublished Ph.D (Economic) Thesis of Benson Idahosa University.

Ihensekhien, O.A. & Ovenseri-Ogbomo, F.O. (2016). Unemployment and economic growth: Evidence from Low income countries in Sub-Saharan Africa. Journal of Finance, Banking and Investment, Vol.4. No.2.

International Labour Organization (ILO, 2017). Global Employment Trends for Youth.

Johansen, S. & Juselius, K. (1990). Maximum Likelihood estimation and inflerence on co-integration with application to the demand for money. Oxford Bulletin of Economics and statistics 521: 169-210.

Johansen, S. (1988). Statistical analysis of co-integration vector, Journal of Economic Dynamics and Control, 12: 231-254.

Kamgnia, B.D (2006). Growth-Employment nexus: the specificities in Africa. Acceleratind Africa’s development five years in the 21st century. Tunis: African Development Bank.

Khemraj, T., Madrick, J., & Semmler, W., (2006). Okun’s Law and Jobless Growth. New School for Social Research, Online at <http://mpora.ub.uni-muenchen.de/5488//>

Lee, J., (2000). The Robustness of Okun’s Law: Evidence from OECD Countries, *Journal from Macroeconomics,* 22, 331-356.

Madito, O., & Khumato, J., (2014). Economic Growth-Unemployment Nexus in South Africa: VECM Approach. *Mediterranean Journal of Social Sciences*, 5(20), 79-84.

Mankiw, N.G., Romer, D. & Weil, D.N. (1992) A Contribution to the empirics of economic growth. Quarterly Journal of Economics, 107, 407-437.

Mojica, M.A & Tatlonghari, V.M (2017) .The relationship between output growth and unemployment in the Philippines economy (1990-2014): An empirical analysis of variants of Okun’s Law, Journal of Emerging Economies and Islamic Research.5 (1).

Moosa, I.A., (1997). A Cross - Country Comparison of Okun’s Coefficient, *Journal of Comparative Economics* 24(3), 335-356.

Moosa, I.A., (1999). Cyclical Output, Cyclical Unemployment and Okun’s Coefficient, Structural Time Series Approach, *International Review of Economics and Finance,* 8, 293-304.

Obadan, M.I., & Odusola, F.A. (2000) Productivity and unemployment in Nigeria. Ibadan: National Centre for Economic Management and Administration (NCEMA).

Okun, A. (1962), “Potential GNP: its measurement and significance” Proceedings of the Business and Economic Statistics section of the *American Statistical Association*, pp 98-104.

Ozel, H.A, Sezgin,F.H & Topkaya,O.(2013) Investigation of Economic growth and unemployment relationship for G7 countries using regression analysis. *International journal of Business and Social Sciences*. Vol.4 (6).

Pissarides, C., (1990). Equilibrium Unemployment Theory, Oxford, Blackwell.

Pissarides, C., (1992). “Loss of skills during unemployment and persistence of employment shocks” *Quarterly Journal of Economics*, 107 (4), 1371-1391.

Prachowny, M.F.J., (1993). Okun’s Law: Theoretical Foundation, and Revised Estimates, *Review of Economics and Statistics*, 75, 331-336.

Saint – Paul, G.J., (1992). Productivity growth and the structure of the business cycle, *European Economic Review*.

Salman, A.K., (2012). Testing the Causal Nexus between Output and Unemployment: Swedish Data. *International Business Research*. 5(10), 29-45.

Sanchis-i-Marco, M., (2011). Falacias, dilamas y Paradojas, La Economia Espanola: 1980-2010, publicaciones de la Universidad de Valencia.

Semmler, W., & Zhang, W., (2005). “The Impact of Output Growth, Labour Market Institution and Macro Policies on Unemployment” Working Paper, SCEPA.

Tatoglu, F.Y., (2011). “The long and short term effects between unemployment and economic growth in Europe” Dogus University: Dergisi, 12:99-113.

Tombolo, G.A., and Hasegawa, M.M., (2014). Okun’s Law: Evidence for the Brazilian Economy, on line at <http://mpra.ub.uni-muenchen.de/54766/>.

United Nations (2011). *World Population Prospect*. The 2010 Revision, New York, UN Population Division.

United Nations (2015). Tranforming our World: the 2030sustainable development goals, New York: UN Department of Economic and Social Affairs.

Weber, C.E., (1995). Cyclical Output, Cyclical Unemployment and Okun’s Coefficient. A New Approach. *Journal of Applied Econometrics*, 433-445.

World Bank (2014) World Development Indicators, Washington D.C: World Bank.

World Bank (2018) World Development Indicators, Washington D.C: World Bank.

Zanin, L., & Marra, G., (2011). Rolling Regression Versus Time-Varying Coefficient Modeling: An Empirical Investigation of the Okun’s Law in some Euro Area Countries. *Bulletin of Economic Research*, 64(1).