An Analytical Study Of The Impact Of Unemployment On Economic Growth In Kenya

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Abstract:*- One of the most pressing problems facing the Kenyan economy is the high rates of unemployment, which has been erratic over the past few years. To examine the existing relationship between unemployment and economic growth, this paper employed Johansen Cointegration, error correction mechanism (ECM), and Granger causality to analyze long-run, short-run and direction of causality respectively. The result indicated existence of long run relationship between unemployment and economic growth in Kenya. Unemployment rate has a positive impact on the economic growth on both the short run and long run. The Granger causality test suggested existence of a unidirectional causality running from unemployment to economic growth*
Keywords: *Unemployment, Economic Growth, Long-Run, Short-Run, Granger Causality*
JEL classification: B22,E24

I.   Introduction

High rates of unemployment remains a major challenge to Africa's development (ILO, 2008) and is therefore a key concern for African policymakers and stakeholders. While many programs, projects and policies are aimed at problems in the region, unemployment and underemployment remain major hindrance to the full utilization of human capital. In Kenya, after independence in 1963, the state identified unemployment and poverty as the main problems faced by Kenyan citizens (Republic of Kenya, 1965). Fifty years later, despite many policy being adopted, poverty continues to plague many Kenyans with millions of people unemployed, under employed or "working poor ". A study conducted under UNDP (Pollin et al., 2007) showed that in 2005 a large number of people who worked could be classified as working poor as their labour income was below the poverty line.

In Kenya, unemployment can be attributed to a number of aspects including, rapid population and Labour force growth, skills, the Labour market information mismatch problems, structural adjustment programs, sluggish or declining economy and Labour market settings. First, the high growth of Kenya's population as well as Labour force proportionate to formal sector employment means that majority of workers are forced to enter the informal sector, some of which may reflect the disguised unemployment or open unemployment. The high growth rate in the youth population thus an increase in Labour force participation have led to more Labour supply than demand. As a result unemployment particularly among young people has surged specifically in the urban areas. Secondly, Skill mismatch hypothesis. This hypothesis suggest that the skills generated by the education system are undervalued by employers. As a result, unemployed persons do not fill existing vacancies and employers are reluctant to employ existing candidates. This mismatch is highly pronounced for newly graduates, which partly explains the high rate of unemployment among young people and those newly enrolled in the job market.

Another reason is Labor market information problem. Lack of Labour market information is a constraint in the search for work, friction unemployment may be common. According to CBS (2002) the lack of an active Employment Placement Bureau is a possible cause of unemployment. The lack of adequate and up to date Labour market information might also exacerbate the gap between Labour demanded and the availability of specific skills. Lack of job market information is often considered to be one of the reasons why job seekers ' qualifications clearly do not match the employer's needs.

Structural adjusted program Structural adjustment programs and economic reforms in 1992 could be reason for high rates of unemployment. Under the structural adjustment Programme domestic prices were deregulated, Subsidies for fertilizers, transport and fuel were eliminated while subsidies for health education and social amenities were also reduced. Manda (2004) reported a rise in unemployment during the reform period from the

1970 to the 1990 due to layoffs in the civil servant, the collapse of private companies and layoffs in other private companies. This period was linked with a shift in Labour demanded in favor of a highly skilled personnel at the expense of full time jobs.

II. Theoretical and Empirical Literature

Okun's Law
Okun's law links Friedman's specification of the Phillip's curve with the original Phillip's curve. It describes the short-run relationship between the GNP gap and the unemployment rate.
Okun's law upholds the existence of a deleterious link between the deviation of the unemployment rate from the natural rate and the deviation of actual real income from potential real income (The GNP gap). This empirical relationship developed by A.M Okun's (1970, 1974) was stated as follows:

$$u = u^* - a\left(\frac{x - x^*}{x^*}\right) \ldots\ldots\ldots\ldots\ldots\ldots\ldots 1$$

Where $a > 0$ $is\ a\ constant\ term$ (Okun's estimate parameter),
u and u^* are the actual and natural rates of unemployment,
x and x^* are the actual real income and potential real income.
In its most basic form, Okun's law can be describes as follows;

$$U_t - U_t^* = b(Y_t - Y_t^*) \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 2$$

Ut = the natural level of unemployment,
U_t^* = current unemployment,
b = Okun's coefficient,
Y_t^* = potential output.

Y_t = the real output ,

III. Literature Review

Mosikari (2013) investigated the impact of the unemployment rate on South Africa's gross domestic product. The variables used in the study include independent variable Gross domestic product, while government expenditure, total investment, inflation and unemployment rate were independent variables. Johansson's Cointegration test was used to test whether there was a Cointegration between the variables. Granger causality suggested that there was no causal relationship between unemployment rate and economic growth.

Oguze and Odim (2015) did a research on the costs of unemployment and it is impact on Nigeria economic growth. The research used time series data from 1970 to 2010 this study used real GDP unemployment interest rates investment imports and money supply. The study used the least squares method. The results show that the unemployment rate has had a negative impact on Nigeria's economic growth.

Ditimi and Ifeakachukwu (2013) investigated the impact that unemployment had on productivity and growth. The research used time series data from 1986 to 2010 the productivity growth was used as dependent variable while government spending, capital, labor , inflation and unemployment rates were independent variables. In this study Cointegration and error correction mechanisms were used. The results suggested positive impact of unemployment to economic growth. The positive link between unemployment and economic growth was consistence to the findings of Alyu (2012) but contrasts with the findings of Ogueze and Odim (2015).

Aliyu (2012) studied macroeconomic policies output and unemployment dynamics this research used data for years 1970 to 2010. The research variables included the transitional component of the natural log of unemployment and the transitional component of the gross domestic product. In this study a linear Okun's model using instantaneous and components of real output was used and a nonlinear variation of the Okun's model was carried out using generalized moment method GMM. The results show that the short term relationship between GDP and unemployment was negative however there existed a positive long term relationship between GDP output and unemployment. The results suggested a nonlinear link between GDP output and unemployment.

IV. Methodology

In order to capture the causal effect of inflation, unemployment and Kenya Economic growth this paper employed casual research design. The study used Time series annual data from 1971 to 2017. This paper employed Okun's law as theoretical basis for explaining the link between unemployment and economic growth. Okun's law upholds the existence of a deleterious link between unemployment rate and economic growth. This paper uses the Aliyu (2012) model as shown below:

$$Y = \beta_0 + \beta_1 U_t + \beta_2 U_{2t} + \varepsilon_t \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (3)$$

Where Y is the output, U is the unemployment rate.
The above model is modified as follows:

$$GDP = \beta_1 + \beta_2 unemp + \varepsilon_t \ldots\ldots\ldots\ldots\ldots\ldots\ldots (4)$$
$$the \log model\ can\ be\ written\ as$$
$$LGDP = \beta_1 + \beta_2 Lunemp + \varepsilon_t \ldots\ldots\ldots\ldots\ldots\ldots (5)$$

Where GDP= real Gross Domestic Product, Unemp= unemployment rate and e$_t$= error term.

V. Estimation Techniques

i. Unit Root Test

In order to avoid spurious regression, this paper employed Augmented Dickey Fuller Test with structural break. Testing unit root without taking into consideration the presence of structural break when there is one or more breaks in the series under study, either in the intercept or slope of the regression would bring out biased result in terms of performance of f and t statistics. This makes it difficult to reject the null hypothesis, that is absence of unit root or to say that the model is stationary.

$$Y_t = \delta Y_{t-1} + u_t \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 6$$

Y_t refers to random walk with drift:

$$Yt = \beta_1 + \delta Y_{t-1} + u_t \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 7$$

Y_t is considered a random walk (drift and trend):

$$Y_t = \beta_1 + \beta_2 t + \delta Y_{t-1} + u_t \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 8$$

Thus t is the time or trend variable as well as u$_t$ is a white noise error term. For easiness, let us study equation (6), a random walk autoregressive model: A suitable technique for carrying out the unit root test is to subtract Y_{t-1} from both sides of equation (8) and to define $\Phi = \delta$-1.
Subtracting Y_{t-1} from both sides of equation (5) gives:

$$Y_t - Y_{t-1} = \delta Y_{t-1} - Y_{t-1} + u_t \ldots\ldots\ldots\ldots\ldots\ldots\ldots 9$$

Collecting like terms we get:

$$\Delta Y_t = (\delta - 1)Y_{t-1} + u_t \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 10$$

In summary this means:

$$\Delta Y_t = \Phi Y_{t-1} + u_t \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 11$$

We take $\Phi = (\delta$-1), Δ is the first difference symbol with ut ~IN [0, σ2]
The dynamic notion under the Dickey-Fuller (DF) unit root test for stationarity is to essentially regress ΔY_t on lag one value of Yt then get the valued Φ is statistically equivalent to zero or not.

Lag Selection Criteria
The paper used the following lag selection criteria

$$AIC = \ln(V2) + \frac{2k}{T} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 12$$

$$SBIC = In(V2) + \frac{k}{T}\ln T \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 13$$

$$HQIC = \ln(V2) + \frac{2k}{T}\ln\left(In(T)\right) \ldots\ldots\ldots\ldots\ldots\ldots\ldots 14$$

Where V2 refers to residual variance, K indicate the number of total parameters to be estimated and T refers to sample size (Brooks, 2014).

ii. Johansen Test of Cointegration

Johansen's *Cointegration* takes starting point is in the vector auto regression of order p is given by:

$$y_t = \mu + \Phi y_{t-1} + \Phi p y_{t-p} + \varepsilon_t \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 15$$

Where y$_t$ refers to nx1 co-integrated vector of variables of order I (1).

iii. Error Correction Mechanism

In order to estimate short run relationship between the two variables in equation (5), the error correction equation is estimated as:

$$\Delta LGDP = \alpha + \sum_{i=1}^{1} \beta_1 \Delta LGDP_{t-i} + \sum_{i=1}^{1} \beta_2 Lunemp_{t-i} + \psi ECM_{t-1} + \varepsilon_t \ldots 16$$

iv.   Granger Causality Test

The Granger causality test is employed to examine the causality between variables.

$$\Delta \text{LGDP} = \alpha + \sum_{i=1}^{1} \beta_1 \Delta LGDP_{t-i} + \sum_{i=1}^{1} \beta_2 Lunemp_{t-i} + \psi ECM_{t-1} + \varepsilon_t \ldots \ldots \ldots .17$$

$$\Delta \text{Lunemp} = \alpha + \sum_{i=1}^{1} \beta_1 \Delta Lunemp_{t-i} + \sum_{i=1}^{1} \beta_2 LGDP_{t-i} + \psi ECM_{t-1} + \varepsilon_t \ldots \ldots \ldots .18$$

From equation (17) and (18) Null hypotheses can be stated as follows:

H_O: unemployment rate does not granger cause GDP

H_O: GDP does not Granger cause unemployment rate

VI.   Analysis And Findings

Table i: Unit root test

Variables	Level			First difference		
	Intercept and trend			Intercept and trend		
	Test sta.	1%	5%	Test sta.	1%	5%
LGDP	-4.38	-5.02	-5.08	-8.68	-5.02	-5.08
Lunemp	-4.85	-5.02	-5.08	-8.13	-5.02	-5.08

From the table i, LGDP and Lunemp are not stationary at level but stationary first difference

Table ii: VAR lag order selection criteria

Lag	logL	LR	FPE	AIC	SC	HQ
1	-9.119	NA	0.006*	0.635*	0.790*	0.685*
2	-5.702	6.121	0.006	0.642	0.973	0.773
3	-4.754	1.635	0.007	0.788	1.292	0.981
4	-1.564	10.27*	0.006	0.676	1.346	0.928

 *denote the criterion for lag order selection

LR: Modified LR test statistic (at 5% level)

AIC: Akaike information criterion

SC: Schwarz information criterion

HQ: Hanna-Quinn information criterion

From table ii above, the optimum lag is lag 1, therefore, this paper used lag 1 to test long run relationship.

Table iii: trace statistics

Hypothesized No of CE(S)	Eigen value	Trace	Statistic 0.05 critical values	Prob.*
None*	0.423	38.47	15.59	0.000
At most1*	0.273	13.47	3.841	0.000

Trace test indicates 2 co-integration eqn. (s) at the 0.05 level

*denotes rejection of the hypothesis at the 0.05 level

**Mackinnon-Haug-Michalis (1999) p values.

From table iii, critical values at 5% level of significant, signifying that unemployment rate and economic growth are co-integrated.

Table iv: Max-Eigen value test

Hypothesized No of CE(S)	Eigen value	Max-Eigen statistic	0.05 critical values	Prob.**
None*	0.433	24.99	14.26	0.0007
At most1*	0.263	13.47	3.841	0.0002

There exist 2 co-integration eqn (s) at the level of 0.05

*denotes rejection of the hypothesis at the 0.05 level

From table 4, null hypothesis, for no co integration was rejected at 5%. The Max-Eigen value statistics were significant at 5% signifying that unemployment rate and economic growth are co-integrated. The result of the normalized equation with respect to DLGDP is (0.7369), implying that 1% increase in unemployment rate increase GDP 73.69%. This was contrary to Okun's law, which hypothesized a negative correlation between unemployment and economic growth.

Table v: The error correction model of DLGDP

Variable	coefficient	Std. Error	t-statistic	prob.
C	0.0058	0.0321	0.1806	0.9830
D(DLGDP)(-1)	-0.2722	0.1576	-1.7272	0.0814
D(Dunemp)(-1)	0.2371	0.0746	3.1783	0.0031
ECM(-1)	-0.4481	0.1267	-3.5367	0.0012
f-statistic is 0.0039				

Table v shows short run impact of unemployment rate on economic growth. The lag of GDP is negative and not statistical significant. In the short run the unemployment rate is positive and statistically significant. The error correction term (ECM) is negative and significant. The negative coefficient of ECM implies speed of adjustment towards equilibrium if any disequilibrium occurs. Consequently, approximately 44.8 percent of the disequilibrium in GDP in the preceding year is automatically corrected in the current year.

Table vi: Autocorrelation and Heteroscedasticity

Test	Serial correlation Lm test	Prob.
F-Stat	1.202	0.3111
Observed R2	3.416	0.1703
Test	Heteroscedasticity	Prob.
F-stat	1.534	0.1669
Observed R2	16.29	0.1754

From Table vi above shows that residuals are not serially correlated and model was free from heteroscedasticity.

Table vii: short run Granger causality test

Null hypothesis	Chi-sq.	Df.	Prob.
Unemployment rate does not Granger cause GDP	9.858	1	0.0017
GDP does not Granger cause unemployment rate	1.871	1	0.1711

From table vii, first we reject the null hypothesis and concludes that unemployment Granger cause GDP. Secondly, we accepted the null hypothesis and concluded that GDP does not Granger cause unemployment rate.

VII. Result discussion, Conclusions and Policy Implications

To examine long run relationship this paper employed Johansen co integration test as the variables under study were co integrated at order one. The results from trace statistic and max eigen value suggested existence of long run relationship between Kenya's unemployment rate and economic growth. Results indicated a long run positive impact of unemployment to economic growth. This results contradicted Okun's law which hypothesize an inverse relationship linking unemployment and the economic growth the short run results suggested a negative and statistically insignificant impact of previous year economic growth to current economic growth. However the impact of unemployment to economic growth was positive and statistically significant. The coefficient for ECM was statistically significant 0.448 it implied that 44.8% of the dis equilibrium as a result of previous year shock was adjusted back to equilibrium in the current year. The Granger causality results suggested that unemployment Granger cause GDP while GDP does not Granger cause unemployment. Hence a unidirectional causality running from unemployment rate to GDP.

Based on the above summary of the findings the study make a number of policy suggestions that can be made to reverse the trend of unemployment instability. It is expected that these recommendations will contribute significantly to the creation of employment opportunities in Kenya. A vital issue raised by the study is that the

government alone is not in a position to solve the problem of high unemployment in Kenya. Governments need to create an enabling environment as well as flexible Labour market regulations that attract many private sectors and small businesses thus combining existing entrepreneurship with new entrepreneurial spirit thus creating more entrepreneurial employment and absorbing large numbers of unemployed groups. Governments have developed most sectoral policies aimed at accelerating growth and job creation. However while these policies are often clear and well thought out they are rarely put in place and where they are implemented there is no attempt to evaluate them. A key suggestion is to urge the government to fully implement and do a follow up on the proposed policies in order to reduce Skill mismatch.

References

[1]. Aktar, I. and Ozturk, L. (2009). Can Unemployment be cured by Economic Growth and Foreign Direct Investment in Turkey? International Research journal of Finance and Economics, 27, pp. 203-2011.
[2]. Aliyu, R. S. (2012) Macroeconomic Policy, Output and Unemployment Dynamics in Nigeria: Is there Evidence of Jobless Growth? 53th Annual Conference of the Nigerian Economic Society.
[3]. Biyase, M. and Bonga-Bonga, L. (2010). South Africa's Growth Paradox, University of Johannseburg.
[4]. Burger, R. and Von Fintel, D. (2009). Determining the Causes of the Rising South African Unemployment Rate:
[5]. An Age, Period and Generational Analysis, Economic Research Southern Africa, Working Papers Number 158.
[6]. Ditimi, A. and Ifeakachukwu,N. P. (2013). TheImpact of Unemployment rate on Productivity Growth in Nigeria: An Error Correction Modelling Approach. International Journal of Economicand Management Sciences Vol. 2, No. 8, PP 01-13.
[7]. Gujarati, D.N. (2004). Basic Econometrics, Fourth Edition, New York: McGraw Hill.
[8]. Hussain, T. Siddiqi, M.W. and Iqbal, A. (2010). A Coherent Relationship between Economic Growth and Unemployment: An Empirical Evidence from Pakistan, International Journal of Human and Social Science, 5(5), pp. 332-339.
[9]. Isobel, F. (2006). Poverty and Unemployment in South Africa, National Labor and Economic Development Institute.
[10]. Johansen, S. (1991). Estimation and Hypothesis Testing of Cointegration Vectors in Gaussian Vector Autoregressive Models, Econometrica, 59, pp. 1551-1580.
[11]. Kreishan. F.M. (2011). Economic Growth and Unemployment: An Empirical Analysis, Journal of Social Sciences, 7(2), pp. 228-231.
[12]. Lee, J. (2000). The Robustness of Okun's law: Evidence from OECD countries, Journal of Macroeconomics, 22(2), pp. 331-356.
[13]. Mafiri, M.I. (2002). Socio-Economic Impact of Unemployment. Pretoria: Van Schaik Publisher.
[14]. Samson, M. Quene, K.M. and Niekerk, I.V. (2001). Capital/Skills – Intensity and Job Creation: An Analysis of Policy Options, Presentation to the Trade and Industrial policy Strategies Forum: Economic Policy Research Institute.
[15]. Mosikari, T.J (2013), the Effect of Unemployment Rate on Gross Domestic; Case Study of South Africa. Mediterranean Journal of Social Science. Vol.4, No. 6.
[16]. Ogueze, V.C and Odim, O.K (2015), the cost of Unemployment and its effects on GDP Growth in Nigeria. World Applied Science Journal 33(1): 86-95.
[17]. Okun, A.M (1962). Potential GNP: its Measurement and Significance. American Statistical Association, Proceeding of the Business and Economics section, PP. 98-104
[18]. Trpkova, M. and Tashevska, B. (2011). Determinants of Economic Growth in South-East Europe: A Panel Data Approach, Perspectives of Innovations, Economics and Business, 7(1), pp. 12-15.