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Effect of Inflation on Unemployment In Kenya

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Abstract: ***Unemployment arises when people are physically capable and willing to work at any existing rate of wages, but they cannot find jobs. Different theories and studies differ on the crucial determinants of unemployment in an economy. In Kenya, policies and strategies have been put in place by the government to reduce unemployment. However, this problem remains a threat to the economic growth. This study, therefore, aimed to analyze the effects of inflation on the unemployment. The causal research design was used to establish the effects of this macroeconomic variable on the unemployment rate. A Cointegration methodology was used to establish the cause-effect relationship between the variables while the hypothesis was tested at 5% level of significance. The study revealed that inflation rate with p-value < than 0.05 had an inverse relationship with an unemployment rate in the long run as well as in short run. The study recommended that the government should come up with policies that help in ensuring a minimum possible rate of inflation in the country to achieve lowest possible levels of unemployment. The study would form the basis for further study to establish the optimal rates of the inflation and unemployment in Kenya.***

Keywords: Cointegration, Inflation, Philips Curve, Unemployment

1. Introduction

Unemployment is a social, political as well as the economic challenge to the country. Joblessness leads to the wastage of human resources, robbery, theft, terrorism, mental illness like depression as well as murder, (Murugan, 2013). Globally, unemployment continues to increase in both developing and the developed nations. In 2014, over 201 million people were unemployed in the world, a figure that is 31 million more individuals that were unemployed before the financial crisis in 2007 (ILO, 2015). Pasquali, (2015) states that in the United States, the rate of unemployment reached the highest record of 9.6% in 2010. However, in the consecutive years, the rate of unemployment started declining reaching 8.9% in 2011 and 5.9% in 2014. In Europe, on the other hand, the rate of unemployment has been on an increasing trend. In 2009 the rate was 9.6%, 10.2% in 2010 and 11.9% in 2013. In Greece, the rate of unemployment was 7.7% in 2008, 9.5% in 2009, 12.6% in 2010, and 17.7% in 2011 and reached 27.5% by 2013. According to ILO (2015), in 2014 about 5.9% of the total labour force was unemployed with wide variations in different countries. Specifically, countries in the Sub-Saharan Africa and North Africa continue to suffer from high levels of unemployment rates, at times reaching 30% of the total labour force. In East Africa, most countries record low level of unemployment compared to Kenya. Rwanda, for instance, records an average rate of 1.3% while Tanzania recorded an average rate of 11.5% of the level of unemployment between 2001 and 2013 (Secretariat, 2014). Although the Kenyan government has implemented many policies like Kazi Kwa Vijana, the rate of unemployment remains a significant problem to the Kenyan economic growth. For instance, since 1999 to 2011 the averaged unemployment rate was 22.43%. In 2006, the level of unemployment was lowest at 12.7% and increased to 40% in 2011, 46% in 2013 and 47% in 2014. In 2015 the level of unemployment reduced to 41%. However, in 2016, the rate was forecasted to rise to about 46%, (Kenya Unemployment Rate, 2016). The concern, therefore, arises on the contribution of the macroeconomic variables to the rate of the unemployment in Kenya. For instance, it is necessary to understand the effects of changes in variables like inflation, real interest rates, and population growth on the unemployment.

Inflation is a general price increase of different commodities rather than a single commodity (Hall, 2009). Arnold (2008) states that there exists an inverse relationship between the rate of inflation and the level of unemployment, such that when the inflation rate is high, unemployment is low and vice versa. In Kenya, the inflation rate has not been stable. In March 2009, the level of inflation was 17.07% and as low as 3.93% in January 2011 while in January 2016, it was recorded as 6.77%. On the other hand, the level of unemployment in Kenya in 2006 to 2009 was 12.7% before rising to 40% in 2011, 46% in 2013 and 47% in 2014. In 2015 the level of unemployment reduced to 41%. However, in 2016, the rate was forecasted to rise to about 46%, (Kenya Unemployment Rate, 2016). A theoretical relationship between unemployment and inflation, therefore, seemed to have existed in the short run between 2009 and 2011, since a decline in the inflation rate was accompanied by a rise in the level of unemployment.

In an economic survey conducted in Kenya in 2014, about 11.8 million Kenyans were employed in the informal sector while only 2.4 million were in the formal or the modern sectors (Irungu, 2016). Informal sectors use traditional production methods hence leading to underutilization of resources and as a consequence resulting to unemployment. Theories on unemployment such as classical and Keynesian theories contradict on their view on unemployment. Monetarists views that the practice of controlling inflation in efforts to facilitate investment and growth to be more imperative and will lead to an escalation in the employment in the long run. Keynes, on the other hand, argues that smoothing out of the cycles in the business by manipulating the aggregate demand is more imperative in reducing the unemployment rate (Murugan, 2013). Omollo (2010) revealed that, even though the policies that were formulated by the government viewed the economic growth as the principal means of creating the employment, it had a weak contribution to job creation, hence raising the need to

determine the effects of other macroeconomic variables on unemployment. This research, hence, sought to establish the effects of inflation rate on the unemployment rate in Kenya.

2. Literature Review

Inflation and Unemployment

Inflation is a general price increase of different commodities rather than a single commodity (Hall, 2009). The trade-off between unemployment and inflation was reported first in 1958 by A.W Philips hence forming the origin of Philips Curve. The trade-off between the two variables is that as the rate of unemployment declines, labourers are empowered to demand higher salaries and wages. In return, the producers or the employees transfer the added cost to the consumers by raising the prices of the goods. As a result, this increases the level of inflation in the economy. From Philips curve, policymakers can only solve one problem. A policy maker can only reduce unemployment and raise inflation or increase unemployment and reduce the inflation but not both. In the 1960s, Monetarists and the Keynesians differed in their view towards the unemployment and the inflation. Monetarists, on the one hand, emphasized low inflation while the Keynesians, on the contrary, emphasized on the job creation hence creating a predicament, (Bross, 2016). Kevin (2008) analyzed a real situation to relate the unemployment and inflation. The finding was that the employees who anticipate an increase in the commodity prices demand that their wages be increased at the same rate hence maintaining their purchasing power.

Furuoka and Munir (2014) evaluated the empirical relationship between the inflation rate and the level of unemployment in Malaysia by an application of error correction model. It was observed that there existed an equilibrium relationship between the rate of inflation as well as the level of unemployment in Malaysia and hence the hypothesis of the Philips curve was supported in this economy. Contrary, to this finding, Umair, and Ullah (2013) investigated the impacts of the inflation rate on the GDP and the inflation rate in Pakistan using a longitudinal approach. It was reported that the rate of inflation had an insignificant effect on GDP as well as the rate of unemployment in this economy at 10% level of significance. The economy experienced a positive correlation between unemployment and the inflation rate hence failing to support the Philips curve concept. These studies were done in developed countries and gave contradicting findings, hence raising concerns on the nature of the relationship between such variables in the developing economies.

2.1 Philips Curve

Philips developed the concept of Philips curve in 1958. The curve shows a trade-off between the rate of unemployment and the prices of goods and services in an economy. Philips curve indicates that there exists an inverse relationship between the unemployment and inflation. In a situation where the level of unemployment is lower, then it follows that the wages in the labour market must increase at a faster rate so as to win the available labour (Forder, 2014). However, in a situation where the level of unemployment is high, it follows that there is an excess supply of labour and hence the labour market need not compete for labour. In such a situation the wages increases slowly. Therefore, the general argument is that lower level of unemployment can only exist at the expense of higher inflation or vice versa. An economic question hence arises from this scenario, "Do we go for lower inflation and higher unemployment or higher inflation and lower unemployment?" However, Phelps and Friedman argued that it is not possible for the government to trade lower unemployment for higher inflation permanently. The relevance of the concept of Philips curve is that it helps in the conceptualization of the relationship between the unemployment rate and the inflation. However, the concept of Philips does not always hold. The theory has its limitations especially due to the existence of the stagflation, which is a situation where the economy is faced with an increase in prices as well as an increase in the level of unemployment (Sherman, 1976). In Kenya, the level of inflation is high, likewise to the level of unemployment hence raising a concern on the validity of the concept of the Philips curve.

3. Methodology

This study employed the causal research design since the aim was to establish effects of inflation on the unemployment rate in Kenya. The target population for this study was the performance of inflation in Kenya for 52 years from 1963 to 2015. This is a period when the Kenya economy had been under the watch of its independent government. Purposive sampling method was used. The sample size comprised of 30 years from 1985 to 2015. The researcher used the secondary data, and hence the checklist was the appropriate instrument for the data collection. The study utilized the time series data as it involved the collection of data recorded annually for 30 years. Stationarity in the data was tested using the Augmented Dickey-Fuller test in the PC-Give Ox-metrics software after which, the E-views and STATA were used in the analysis.

The Model Specification

$$\Delta \text{Log} UNR_{t-i} = \beta_0 + \beta_1 \Delta \text{Log}(INFL)_{t-i} + \varepsilon_i \ldots\ldots\ldots 3.1$$

Where:

β_0: The level of unemployment that is not depending on the factors under consideration

β_1: The coefficients of inflation rate that determines how the rate of unemployment changes if the respective determinants changes by one unit.

ε_i: These represent other factors that influence the rate of unemployment in Kenya other than inflation

ΔLogUNR: Logarithms of unemployment rate

ΔLog INFL: Logarithms of inflation rate

4. Results and Discussions

4.1 Stationary Tests

Table 1: Stationary Statistics

Variable	ADF statistic	ADF first difference	ADF second difference	ADF third difference	Mackinon critical values at 5% significance level
Unemployment	2.492	-2.622	Stationary	stationary	-1.96
Inflation rate	-1.554	-6.281	Stationary	stationary	-1.96

Table 1 shows the stationary statistics of different variables considered in this study. Considering the unemployment rate, the table shows that its ADF statistics of 2.492 at level form is greater than the Mackinnon critical value of -1.96 at 5% significance level. This implies that the null hypothesis is accepted, therefore meaning that the unemployment rate is not stationary in the level form and hence a need for further differencing. In regards to inflation rate, table 4 shows that the ADF statistic at level form is -1.554, which is greater than the Mackinnon critical value of -1.96. The implication in this case is therefore, that inflation rate is not stationary at the level form hence the need for first difference. At first difference, the study shows that the ADF statistic for unemployment and inflation is -2.622 and -6.281 respectively, which is less than the Mackinnon critical value of -1.96. This implies that, at first difference, unemployment and inflation rate is stationary and hence no need for further differencing.

4.2 Lag selection

Table 2: Lags for Long Run and Short Run Model

	Long run	Model	Short run	Model
Lags	AIC	SBIC	AIC	SBIC
0	1.26317	1.46231	-1.59161	-1.39246
1	-1.62466*	-1.37573*	-1.89508	-1.64615
2	-1.60849	-1.30977	-2.30393*	-2.00521*
3	-1.50849	-1.15999	-2.21688	-1.86837
4	-1.47813	-1.07984	-2.12942	-1.73113

Table 2 shows the results of choosing the appropriate lag for long run and short run model. The maximum number of lags given is from lag 0 to lag 4. Comparing the results of the AIC and the SBIC in long run model, the study shows that that the minimum number of lags in both cases is 1 at AIC and SBIC at values of -1.62466 and -1.37573 respectively. The implication from this study therefore follows that the long run model was run at lag length 1. On the other hand, considering the lag order selection criterion in the case of the short run model, the study shows that the minimum number of lags according to both AIC and SBIC is lag 2. The study hence shows that the lag length 2 was chosen as the most appropriate in the short run model.

Table 3: Test for Co-integration

D-lag	ADF statistics	Beta Y_1	F-brob	Adf at 5% significance level
2	-3.210	-0.58710		-1.96
1	-3.372	-0.36309	0.4327	-1.96
0	-7.434	-0.57122	0.6128	-1.96

Table 3 shows the results of the Co-integration between the explained and explanatory variables. The table shows that ADF statistics from lag 0 to lag 2 are less than the Mackinnon critical values at 5% significance level. At lag 0, the ADF statistics is -7.434 which is less than -1.96. Similarly, at lag 1, the ADF statistic of the residuals is -3.372, which is also less than the Mackinnon critical value. The results therefore imply that the null hypothesis in this case failed to be accepted, hence implying that there is Co-integration among the variables under consideration.

4.3 Normality Test of Residuals

Table 4: Normality Test

Test	Test value	Chi2	Df	Prob>chi2
Jarque-bera		3.675	2	0.15918
Skewness	0.88719	2.886	1	0.08935
Kurtosis	3.928	0.789	1	0.3743

Table 4 shows the results of normality test. The chi-square value of the Jarque-bera obtained was 3.675 at 2 degree of freedom and the probability of 0.15918. In this case, the probability value is greater than the significance value of 0.05 hence indicating that the null hypothesis was rejected. It implies therefore that the residuals are normally distributed. In regards to the Skewness, table 8 shows that the test value is 0.88719 and has a chi-square value of 2.886, degree of freedom of 1 and probability value of 0.08935. Comparing with 0.005, the study found that the skewness value exceeds 0.005 hence implying that the null hypothesis is rejected, meaning that the disturbances are normally distributed as well as symmetrical. Results on the Kurtosis on the other hand show the Kurtosis value was obtained as 3.928, a chi-square of 0.789 at degree of freedom of 1. The value of the probability statistic was obtained as 0.3743 which is greater than 0.05, hence implying that the null hypothesis was rejected, meaning that the residuals were normally distributed.

4.4 Lagrange Multiplier Test

Table 5: Lagrange Multiplier test

Lag	Chi2	Df	Prob>chi2
1	0.1129	1	0.73685
2	0.7395	1	0.38981

Ho: No autocorrelation at lag order

Table 5 shows the test of the Lagrange multiplier test. The chi-square values at lag 1 and lag 2 are 0.1129 and 0.7395 respectively at 1 degree of freedom. The probability values obtained for lags 1 and 2 are 0.73685 and 0.38981 respectively. Comparing the probability static at lag 1 and the significance value of 0.05, then 0.73685 is greater than 0.05, hence indicating that the null hypothesis is accepted. Therefore this means that, at lag 1 there is no problem of autocorrelation. Similarly, comparing probability statistic at lag 2 with the significance value at 5%, results shows that 0.38981 is greater than 0.05, hence implying that null hypothesis is accepted, implying that there is no autocorrelation among the lags at lag 2. This means that the results obtained at either lags are reliable since the error terms are sequentially independent.

4.5 Regression Analysis

Table 6: Long Run Regression Model

Variable	Coefficient	Std. error	t-value	t-prob
Constant	-0.195545	0.8073	-0.242	0.04124
Inflation_1	-0.003836	0.03361	-0.114	0.03109
Dummy_1	0.123325	0.1295	0.952	0.3585
R^2	0.878003	F(9,13)=	64.22	(0.000)
DW	2.14			

$$Y = -0.195541 - 0.003836X_1 + 0.1233d_1$$

Table 6 shows the results of the long run regression model. From the table, coefficient of the constant was obtained as -0.195545. The standard error of constant, t-value, and t-probability was obtained as 0.8073, -0.242, and 0.04124 respectively. Based on the lag selected for long run model, the explanatory variables were presented based on lag 1. The coefficient of the relationship between the inflation rate and unemployment rate was obtained as -0.003836, while the standard error, t-value, and t-probability was obtained as 0.03361, -0.114, and 0.03109, respectively. The overall R-squared of the model was obtained as 0.878003 meaning that 87.8003% of the variation in the unemployment rate was explained by the explanatory variable. The Durbin Watson statistic was 2.14 meaning that there was no problem of autocorrelation among the error terms. The table shows that the F statistic was 64.22 at p value of 0.000. Since the p-value is less than the significance value of 0.05, then, the findings imply that the overall model was statistically significant.

Table 7: Short Run Regression Model

Variable	Coefficient	Std. error	t-value	t-prob
Constant	0.00328844	0.008732	0.377	0.03176
Inflation_2	-0.0158615	0.01152	-1.38	0.02110
Residuals_2	-0.659841	0.2347	-2.81	0.0261
R^2	0.871201	F(14,7)=	16.86	(0.000)
DW	2.26			

$$Y = 0.00328844 - 0.0158615X_1 + \varepsilon_i$$

Table 7 shows the results of the short run regression model. From the table, coefficient of the constant was obtained as 0.00328844. The standard error of constant, t-value, and t-probability was obtained as 0.008732, 0.377, and 0.03176 respectively. Based on the lag selected for short run model, the explanatory variables were presented based on lag 2. The coefficient of the relationship between the inflation rate and unemployment rate was obtained as -0.0158615, while the standard error, t-value, and t-probability was obtained as 0.01152, -1.38, and 0.02110 respectively. The overall R-squared of the model was obtained as 0.871201, meaning that 87.1201% of the variation in the unemployment rate was explained by the explanatory variable. The Durbin Watson statistic was 2.26 meaning that there was no problem of autocorrelation among the error terms. The table shows that the F statistic was 16.86 at p value of 0.000. Since the p-value is less than the significance value of 0.05, then, the findings imply that the overall model was statistically significant.

4.6 The Effects of Inflation Rate on Unemployment Rate

The study sought to find out if the inflation rate had significant effects on the unemployment rate in Kenya. According to table 7, the coefficient of the relationship between unemployment rate and inflation rate in short run was -0.0158615 while in long run it was -0.003836. The study therefore found out that there exists a negative relationship between inflation and unemployment rate both in short run and in long run. The finding of this study shows that, both in short run and long run, as the inflation rate increases, the rate of unemployment decreases and as the rate of inflation decreases, the rate of unemployment also increases. In short run, the p-value of 0.02110 was obtained which is less than the significance value of 0.05. The implication in this case is therefore that in short run, there is negative significant influence of the inflation rate on the level of unemployment in Kenya. In long run, the p-value of 0.03109 was obtained, which is also less than significance level of 0.05. The result of this study therefore shows that the finding failed to accept the null hypothesis, meaning that there is significant effect of inflation rate on unemployment rate in Kenya in respect of the period considered. Possibly, as the inflation rate increases, the investors mostly in the private sectors are encouraged to invest more due to higher net profits hence increasing the number of workers and in return reducing the unemployment rate in Kenya.

4.7 Summary of the Findings

The study found out that both in short run and long run, there exists significant negative relationship between inflation rate and unemployment rate. This follows that, the study failed to accept the null hypothesis stating that there is significant effects of inflation rate on unemployment in Kenya.

5. Conclusions

The study found out that inflation rate has significant negative influence on unemployment rate in Kenya both in short run and in long run. An increase in the rate of inflation implies that there will be significant decline in the rate of unemployment in Kenya. As a consequence, the study found out that the concept of Philips Curve does not hold in Kenya. As a result of the findings, null hypothesis failed to be accepted. The study concludes that, due to increase in the inflation rate, the prices of goods and services increases hence increasing the willingness of suppliers to supply more goods and services. In return, the producers will require more labour and hence this will result to lowering the unemployment rate.

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