

Relationship between Inflation and Unemployment in Uganda

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Abstract

The study aimed at the relationship between Inflation and Unemployment in Uganda and it was guided by the following objectives; To determine the relationship between consumer demand and unemployment rate, to determine the relationship between government expenditure and unemployment rate and to determine the relationship between exchange rates and unemployment rate. To adequately analyze and understand the intricate relationship between inflation and unemployment rate in the Uganda context, researchers in the past had employed rigorous quantitative and qualitative methodologies. On the quantitative side, Muhumuza and Kasekende (2019) leveraged cointegration and error correction modeling techniques on time series data from 1980 to 2015 obtained from the Uganda Bureau of Statistics to empirically test for both the short-run and long-run dynamics between inflation and joblessness. Their vector error correction model specification as cited in the African Development Review allowed them to separately identify the influence of demand and supply shocks on the Phillips curve relationship over different time horizons. From the findings, the positive sign indicated a positive relationship, implying that higher exchange rates were associated with higher unemployment rates. The standardized coefficient of 0.712 indicated that a one-standard-deviation increase in exchange rates was associated with a 0.712 standard deviation increased in the unemployment rate. This standardized measure allowed for the comparison of the relative impact of exchange rates with other variables in the model. The very low p-value ($p < 0.001$) associated with the t-statistic for exchange rates indicates that the relationship is statistically significant. Specifically, the central bank must formulate monetary policies using a optimal policy mix approach that incorporates complementary fiscal, incomes and structural measures to stimulate aggregate demand and jobs growth without fueling cost-push inflationary pressures above target.

Key words: consumer demand, government expenditure, exchange rates, inflation and unemployment rate

Background of the study

The relationship between inflation and the unemployment rate has been extensively studied by economists due to its importance for macroeconomic policy making (Frank et al., 2023). In the context of Uganda, research has shown that there is an inverse relationship between the two macroeconomic variables of inflation and unemployment (Nelson & Christopher, 2022). As explained by (Victor et al., 2022) in their study published in Foreign Trade Review, Uganda generally follows a Phillips curve model where higher inflation is associated with lower unemployment and vice versa (Kazaara & Kazaara, 2023). This inverse relationship implied by the Phillips curve suggests that there is a short-run trade-off between inflation and unemployment, such that policies aimed at reducing unemployment can increase inflationary pressures in the economy and vice versa (Oliver et al., 2023).

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Empirical evidence from Uganda shows that periods of low and declining inflation have usually coincided with higher unemployment rates and vice versa (Frank et al., 2023). For example, as a result of the 2008 global financial crisis, Uganda experienced a decline in disinflation from double-digit inflation to a single-digit range of 3-5% (Victor et al., 2022), for example, according to the Uganda Bureau of Statistics (Victor et al., 2022). crisis to more than 6% during 2009-2011, affecting several sectors such as manufacturing, construction and services. Conversely, episodes of rising inflation above 5% in Uganda were accompanied by lower unemployment rates below 4%. This inverse correlation can be attributed to expansionary monetary and fiscal policies during inflationary periods, which boost aggregate demand and jobs in the short run (Lydia et al., 2023).

The empirical pattern in Uganda is also supported by economic theory, which suggests that loose macroeconomic policies to reduce unemployment in the short run tend to increase aggregate demand beyond productive capacity, leading to cost inflation. On the other hand, contractionary policies to reduce inflation may lead firms to reduce output and jobs in the short run, increasing unemployment (Winny et al., 2023). Considering Uganda's experience following the Phillips curve framework, it can therefore be said with evidence that there is an inverse relationship between inflation and unemployment in the country, where higher inflation is associated with lower unemployment and vice versa in the short as well as the long run. However, the slope of the Phillips curve may not be stable over time and could change based on structural factors in the economy. This inverse relationship remains an important consideration for the Bank of Uganda when considering the trade-offs between inflation targeting and job growth in determining the appropriate stance of monetary policy (Christopher et al., 2022).

Problem statement

While the inverse relationship between inflation and unemployment proposed by economic theory and proven over time in Uganda provides some insights, it poses some challenges for macroeconomic policy making in the country (Wegulo et al., 2023). One of the main problems, as noted by Muhumuza and Kasekende (2019) in their research published in the African Development Review, is that the short-run trade-off between inflation and unemployment depicted in the Phillips curve may not be sustainable in the long run. The Bank of Uganda cannot reliably pursue expansionary monetary policy to reduce unemployment indefinitely without risking unmooring of inflationary expectations (Kazaara & Kazaara, 2023). Continued increases in money supply and credit growth to artificially boost aggregate demand and jobs could eventually translate into higher inflation through cost factors that exceed the threshold allowable under the Bank's inflation targeting framework (Denis & Richard, 2023). Similarly, a contractionary policy aimed only at reducing inflation in Uganda may succeed in the short term, but a significant increase in unemployment in the process could destabilize the economy. As highlighted by Mutebi and Bagyenda (2010) in a paper presented at the African Economic Research Consortium Conference (Innocent et al., 2023), persistently high unemployment rates above 6% have potential negative social consequences such as poverty, crime

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and political unrest in Uganda. . Therefore, over-reliance on demand-suppressing policies to tame inflation poses problems for the Bank of Uganda in maintaining macroeconomic and social stability in the long term. In addition, inflation and unemployment rates in Uganda are also affected by external factors such as global commodity prices, weather affecting agriculture (Collins et al., 2023), exchange rate fluctuations and global monetary conditions – complicating policy trade-offs. In essence, while the empirical Phillips curve relationship offers guidance, it presents a challenge for policymakers in Uganda who are trying to achieve both low inflation and unemployment simultaneously on a sustainable basis. This requires alternative evidence-based policy frameworks and a balanced mix of policies that do not focus solely on the relationship between inflation and unemployment.

Objectives of the study

- 1. To determine the relationship between consumer demand and unemployment rate
- 2. To determine the relationship between government expenditure and unemployment rate
- 3. To determine the relationship between exchange rates and unemployment rate

Methodology

To adequately analyze and understand the intricate relationship between inflation and unemployment rate in the Uganda context, researchers in the past had employed rigorous quantitative and qualitative methodologies. On the quantitative side, Muhumuza and Kasekende (2019) leveraged cointegration and error correction modeling techniques on time series data from 1980 to 2015 obtained from the Uganda Bureau of Statistics to empirically test for both the short-run and long-run dynamics between inflation and joblessness. Their vector error correction model specification as cited in the African Development Review allowed them to separately identify the influence of demand and supply shocks on the Phillips curve relationship over different time horizons. Moreover, Mutebi and Bagyenda (2010) in their paper for the African Economic Research Consortium utilized structural vector autoregressive modeling on quarterly data from 2000 to 2010 to trace variable impulse responses and disentangle bidirectional causality running between inflation and unemployment using SPSS & STATA (Nelson, Christopher, & Milton, 2022). Their sophisticated econometric approach as highlighted in the conference paper helped address issues of endogeneity to better establish potential policy transmission mechanisms. Additionally, qualitative methods had also been employed. For instance, Rujumba and Mutebi (2012) in the Foreign Trade Review conducted a contextual analysis of Uganda's macroeconomic policies and economic cycles since the 1980s based on a review of central bank reports and discussions with policymakers to corroborate empirical findings.

RESULTS

Exchange rates and unemployment rate

Table 1: Model summary for exchange rates and unemployment rate

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
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1	.712	.507	.503	.27449
a. Predictors: (Constant), exchange rates				

Source; Primary data, 2023

The value of R is 0.712. This represents the correlation between the observed values of the dependent variable (unemployment rate) and the values predicted by the model. In this case, the correlation is positive, indicating a relationship between exchange rates and the unemployment rate. The R Square value is 0.507 (50.7%). This represents the proportion of the variance in the dependent variable (unemployment rate) that is explained by the independent variable (exchange rates) in the model (Nelson et al., 2023). In other words, approximately 50.7% of the variability in the unemployment rate is accounted for by changes in exchange rates. The Adjusted R Square adjusts the R Square value based on the number of predictors in the model. Here, it is 0.503, indicating the proportion of variance adjusted for the number of predictors. The R value of 0.712 suggests a moderate to strong positive correlation between exchange rates and the unemployment rate. This implies that as exchange rates change, there is a notable tendency for the unemployment rate to also change in the same direction (Godfrey et al., 2023).

Table 2: ANOVA values for exchange rates and unemployment rate

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	8.607	1	8.607	114.231	.000 ^b
	Residual	8.363	114	.075		
	Total	16.970	115			
a. Dependent Variable: unemployment rate						
b. Predictors: (Constant), exchange rates						

Source; Primary Data, 2023

The sum of squares for the regression model is 8.607. This value represents the variability in the dependent variable (unemployment rate) that is explained by the independent variable (exchange rates) in the model. Mean Square is obtained by dividing the sum of squares by its degrees of freedom. In this case, it is 8.607. The F-statistic is a ratio of the mean square for the regression model to the mean square of the residuals (Victor et al., 2022). Here, it is 114.231. This statistic tests the overall significance of the regression model. The significance level associated with the F-statistic is .000 ($p < 0.001$). This indicates that the regression model is statistically significant. The sum of squares for the residuals (unexplained variability) is 8.363 (Victor et al., 2022). This represents the variability in the dependent variable that is not explained by the independent variable in the model. The highly significant F-statistic ($F = 114.231$, $p < 0.001$) indicates that the overall regression model is statistically significant. This suggests that there is a significant relationship between exchange rates and the unemployment rate. The sum of squares for regression (8.607) indicates the portion of the total variability in the unemployment rate that is explained by the model. The sum of squares for residuals (8.363) represents the unexplained portion. Further analysis, such as examining the coefficients of the model,



assessing multicollinearity, and conducting diagnostic checks on residuals, is recommended to ensure the robustness and validity of the regression findings.

Table 3: Coefficients of exchange rates and unemployment rate

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.562	.219		7.130	.000
	exchange rates	.629	.059	.712	10.688	.000
a. Dependent Variable: unemployment rate						

Source; Primary Data, 2023

The intercept or constant term is 1.562. This represents the estimated value of the dependent variable (unemployment rate) when the independent variable (exchange rates) is zero. However, the interpretation of the constant in this context may not be meaningful, as exchange rates typically do not have a natural zero point. The coefficient for exchange rates is 0.629. This represents the change in the dependent variable (unemployment rate) for a one-unit change in the independent variable (exchange rates). In this case, a positive coefficient suggests a positive relationship. The standard error for the constant is 0.219, and for exchange rates, it is 0.059. These values represent the standard deviation of the coefficient estimates, providing a measure of their precision. The standardized coefficient (Beta) for exchange rates is 0.712. This value represents the change in standard deviations of the dependent variable associated with a one-standard-deviation change in the independent variable. It allows for the comparison of the relative importance of different predictors. The significance level associated with the t-statistic for exchange rates is .000 ($p < 0.001$), indicating that the coefficient for exchange rates is statistically significant. The coefficient of 0.629 suggests that, on average, for each unit increase in exchange rates, the unemployment rate is expected to increase by 0.629 units. The positive sign indicates a positive relationship, implying that higher exchange rates are associated with higher unemployment rates. The standardized coefficient of 0.712 indicates that a one-standard-deviation increase in exchange rates is associated with a 0.712 standard deviation increase in the unemployment rate. This standardized measure allows for the comparison of the relative impact of exchange rates with other variables in the model. The very low p-value ($p < 0.001$) associated with the t-statistic for exchange rates indicates that the relationship is statistically significant. Thus, there is strong evidence to reject the null hypothesis that the coefficient for exchange rates is zero.

Table 2: Correlation between Customers demand and unemployment rate

		Customers demand	Unemployment rate
Customers demand	Pearson Correlation	1	.816**
	Sig. (2-tailed)		.000



	N	114	114
Unemployment rate	Pearson Correlation	.816**	1
	Sig. (2-tailed)	.000	
	N	114	114
**. Correlation is significant at the 0.01 level (2-tailed).			

Source; Primary Data, 2023

The Pearson correlation coefficient measures the strength and direction of a linear relationship between two variables. In this table, the Pearson correlation coefficient between customers' demand and the unemployment rate is 0.816 (Gracious, 2023). The significance level associated with the correlation coefficient is 0.000 ($p < 0.001$). This indicates that the correlation is statistically significant. The double asterisks (**) next to the correlation coefficient indicate that the correlation is significant at the 0.01 level (2-tailed). This means that the probability of observing such a strong correlation by chance is less than 1% under the null hypothesis of no correlation (Nelson, Christopher, Teddy, et al., 2022). The Pearson correlation coefficient of 0.816 indicates a very strong positive linear relationship between customers' demand and the unemployment rate. As one variable increases, the other tends to increase as well. The p-value of 0.000 ($p < 0.001$) suggests that the observed correlation is highly unlikely to have occurred by random chance. Therefore, there is strong statistical evidence supporting the existence of a significant correlation between customers' demand and the unemployment rate. The correlation coefficient of 0.816 suggests that the variables are positively correlated, meaning that an increase in customers' demand is associated with an increase in the unemployment rate, and vice versa (Christopher et al., 2022).

Table 5: Correlation between government expenditure and unemployment rate

		Government expenditure	Unemployment rate
Government expenditure	Pearson Correlation	1	.514**
	Sig. (2-tailed)		.000
	N	114	114
Unemployment rate	Pearson Correlation	.514**	1
	Sig. (2-tailed)	.000	
	N	114	114
**. Correlation is significant at the 0.01 level (2-tailed).			

Source; Primary Data, 2023

The Pearson correlation coefficient measures the strength and direction of a linear relationship between two variables. In this table, the Pearson correlation coefficient between government expenditure and the unemployment rate is 0.514. The significance level associated with the correlation coefficient is 0.000 ($p < 0.001$). This indicates that the correlation

is statistically significant. The Pearson correlation coefficient of 0.514 indicates a moderate positive linear relationship between government expenditure and the unemployment rate (Polycarp et al., 2023). As government expenditure increases, the unemployment rate tends to increase as well. The p-value of 0.000 ($p < 0.001$) suggests that the observed correlation is highly unlikely to have occurred by random chance. Therefore, there is strong statistical evidence supporting the existence of a significant correlation between government expenditure and the unemployment rate (Musaibah et al., 2023). The correlation coefficient of 0.514 suggests that the variables are positively correlated, meaning that an increase in government expenditure is associated with an increase in the unemployment rate, and vice versa. While the correlation coefficient reveals the strength and direction of the linear relationship, it does not imply causation. Therefore, the findings suggest an association between government expenditure and the unemployment rate, but the causal link and underlying mechanisms require further investigation.

Conclusion

In conclusion, while previous empirical research has clearly demonstrated an inverse relationship between inflation and unemployment in Uganda based on both economic theory and data analysis, this Phillips curve relationship presents important challenges and limitations for effective and sustainable macroeconomic management going forward. The major problem evidenced is that focusing only on the short-term inflation-unemployment trade-off depicted by the Phillips curve does not guarantee achieving price stability and full employment over the long-run.

Recommendation

Specifically, the central bank must formulate monetary policies using a optimal policy mix approach that incorporates complementary fiscal, incomes and structural measures to stimulate aggregate demand and jobs growth without fueling cost-push inflationary pressures above target. This will help anchor inflation expectations while supporting a higher sustainable pace of economic activities and employment creation. Uganda also needs active labour market policies like skills development programmes, job matching services and labour market reforms to enhance productivity and competitiveness so the economy can absorb more workers at low inflation. Greater exchange rate flexibility and prudent macro-prudential tools should also be utilized to cushion external shocks and maintain internal and external balances.

With enhanced policy coordination between monetary, fiscal and structural reforms based on a thorough understanding of Uganda's macroeconomic dynamics, it may be possible to minimize inflation-unemployment trade-offs and achieve mid to high single digit inflation accompanying yearly decline in joblessness over the medium-term. Sustained progress towards price stability, inclusive growth and full employment will depend on contemporary evidence-based policies rather than solely relying on historical relationships like the Phillips curve.

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