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On the Determinants of Unemployment in Somalia: What is the Role of External Debt?

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ABSTRACT

The linkage between unemployment, inflation, GDP, and external debt spans several economic themes. Because unemployment remains a concern in the global economy, researchers and economists are focused on it. Other things being equal, it is widely acknowledged that achieving price stability will have a favorable impact on employment and economic growth, especially if the optimal threshold can be met. Meanwhile, the right balance remains elusive, as central banks around the world compete to increase employment while maintaining price stability. In this study, we analyze annualized data from 1991 to 2019 to try to understand how unemployment in Somalia responds to changes in the price level. To process the data collection, the ARDL model and the Bound test analytical tools were used. The parameter estimate implies that when the external debt changes by 1%, the jobless rate increases by 0.031%, according to the findings. GDP, on the other hand, had a negative but small impact on the unemployment rate, and was associated with a 0.59% decrease in the unemployment rate. We believe that, rather than depending simply on monetary targeting to balance unemployment, GDP, GDP deflator, and foreign debt, economic deepening can play a supporting role in sustaining an optimal inflation rate and a minimal unemployment level.

1. INTRODUCTION

Somalia has various prospects as it works to establish economic governance institutions, including expanding urbanization, increased use of digital technology, and projected investments in electricity, ports, education, and health. Building resilience to shocks is a priority to assist economic growth and job creation, as high unemployment is one of the most pressing challenges Somalia faces today.

Unemployment is defined as the difference between labor-force participation and employment levels. In other words, it describes the situation in which labor supply surpasses labor demand [1]. The unemployment rate is a percentage calculated by dividing the number of unemployed persons by the total number of people in the labor force [2, 3].

To address the unemployment crisis, which is one of the most pressing concerns confronting many nations [4] an examination of its drivers was required, with the goal of providing a solution to the unemployment problem [5]. In both developed and developing nations, young unemployment is more severe than adult unemployment [6-9].

Somalia has also been plagued by an unemployment crisis for the past three decades. There has not been a single year since 1991 where the unemployment rate was less than 19%, with the exception of 2015-2019, when the rate was 18% (SESRIC Dataset). Many reasons contribute to the high unemployment rate, including political turmoil, economic crises, and natural calamities such as climate change and pandemic illnesses. For example, during Somalia's political instability in the 1990s, the jobless rate reached around 20%. Similarly, the 2001 and 2008 economic crises had an influence on the high unemployment rate. During the COVID-19 outbreak, unemployment reached more over 20%. The Somali government is attempting to take steps to reduce the unemployment rate.

Many different countries are focusing on lowering their unemployment rates. To reduce unemployment, the elements that contribute to the problem must first be identified. Internal and external causes are the two fundamental drivers of unemployment. The first are market fundamentals that influence labor supply and demand, such as worker and trade union preferences, bargaining strength, businesses, technology, and market power. Macroeconomic policies and institutional changes relating to fiscal and monetary policies, as well as the products market, are the second [8]. Other indicators that influence unemployment include the country's economic recession, volatility in the exchange rate, higher interest rates [1], population growth rate (PGR), gross domestic product (GDP), poverty rate (PR), interest rate (IR), and foreign direct investment (FDI) [7]. Several studies have been undertaken to better understand the factors that contribute to unemployment in various countries. To the best of our knowledge, however, there is no research for Somalia. The primary goal of this research is to identify the indicators of unemployment in Somalia. To accomplish this goal, this article examines the relationships between GDP, External

Debt (ExD), Inflation (IN), and Unemployment Rate (UNR). The rest of the paper is organized as follows. Section 2 discusses the existing literature. Section3 describes the data and the methodology. In Section 4 the empirical results are presented, and the last section concludes.

2. LITERATURE REVIEW

Many research have been undertaken to determine the link between unemployment and its factors. The preceding authors' literature is discussed for the study's interested determinants.

According to Funlayo Akeju and Benedict Olanipekun [10], utilizing the Error Correction Model (ECM) and Johasen co-integration test to examine the short and long term connection reveals a negative link between unemployment and economic growth. Their findings show that the factors have both long and short term relationships. Similarly, studies [11-13] used the Auto Regressive Distribution Lag (ARDL) bounds test to illustrate the negative and short-and-long run association. However, the Granger causality Test demonstrates that unemployment and economic growth have no effect on one another [12]. Although the findings of Granger causality demonstrated bidirectional causation between the pairs of real GDP and the unemployment rate, a research by Khalid [14] suggested that there is no indication of a long-run relationship among the variables using the method of Johansen o-integration. Zabri et al. [15] investigated the relationship between GDP, inflation, unemployment, and the Malaysian exchange rate from the first quarter of 2010 to the first quarter of 2022 using the Vector Error Correction Model (VECM). The results show that GDP has a negative relationship with inflation and unemployment.

Since the study of the relationship between unemployment and inflation spans a variety of economic concerns, researchers and economists focus on the subject since unemployment continues to be one of the world economies. Using the ARDL model and the Bound test analytical tools for a time series data from 1999 to 2021, a 1% change in the inflation rate resulted in a 0.13% rise in the unemployment rate [16]. The authors explored how unemployment in Nigeria responds to changes in the price level. Victor et al. [17] used a generalized additive model (GAM) to investigate the inflation-unemployment dynamics in India and the UK during the recession and COVID-19 periods. The results of the analysis revealed that India has positive inflation-unemployment dynamics, whereas the UK has a negative inflation-unemployment relationship. Septrila and Kurniasih [18] used regression analysis to explore and assess the influence of inflation and economic development on the unemployment rate in ASEAN nations from 2010 to 2019. Their findings suggest that inflation and the economy have a negative and insignificant influence on the unemployment rate in ASEAN nations, but have a negative and substantial effect on the unemployment rate in the long run. Although several studies have established temporal positive and negative connections between inflation and unemployment, the Phillips curve has been heavily criticized [19]. Attia Mohamed Omran and Bilan [20] utilized time-series data from 1980 to 2019 using the (VAR) model and the Impulse response function tool (IRF), and the results demonstrate that inflation has a positive association with GDP while adversely impacting the unemployment rate.

Siddiqa [21] investigated the impact of GDP, inflation, remittances, exchange rate, education expenditure, population, and external debt on unemployment and discovered that, aside from the population and the external debt, there is a negative impact on the unemployment rate. Similarly, Nguyen [22] revealed directional correlations between unemployment and foreign debt, GDP, and national spending using the Vector Autoregressive (VAR) Model over a time period ranging from 1987 to 2016. Unlikely, Folawewo and Adeboje [23] looked examined GDP growth, inflation, labor productivity, FDI, external debt, and unemployment. They discovered that FDI and foreign debt have just a minor negative influence on unemployment. Alnaa [24] studied the relationship between foreign debt and unemployment in 25 Sub-Saharan African nations. The result reveals a clear connection between them.

3. METHODOLOGY

A time series data from 1991-2019 is collected from the database released by the SESRIC and the World Bank to understand the relationship between Gross Domestic Product (GDP), Inflation, External Debt and Unemployment in Somalia. Thus, a total of 29 observations is entered for data analysis.

Gross Domestic Product (GDP) data are in constant local currency based on the World Bank calculations. Inflation (Inf) is measured from the GDP Deflator where the External Debt (EXD) is expressed in terms USD currency. The unemployment (UNEMP) is proportion of people who are without work and sought employment in the total labor force. Apart from the GDP all the other data are from the SESRIC database.

Phillips-Perron techniques. The tests revealed constant and probability findings that were analyzed. Unit root tests examine the null hypothesis of a unit root and the alternative hypothesis of a stationary or trend-stationary time series [15]. To assess the long-term relationship between variables, the cointegration test was utilized. According to the cointegration theory [25] non-stationary variables can be linearly combined to generate stationary variables, indicating that these variables have a cointegration link. These standard approaches, however, have been criticized for being highly unreliable in small samples, inconsistent with different order integrated variables, resulting in significantly misleading results, and biased against rejecting the null hypothesis (no-co-integration), necessitating an adjustment for critical values [26-28]. As a consequence, autoregressive distributed lag (ARDL) bounds testing was utilized to increase test power [29-33].

According to Muhd Irpan [28]'s empirical findings, the ARDL cointegration equation may be stated as the ARDL:

$$\Delta UNEMP_t = \alpha_0 + \beta_1 GDP_{t-1} + \beta_2 GDP_DEF_{t-1} +$$

$$\beta_3 EX_DEPT_{t-1} + \sum_{i=0}^{q} \Delta\alpha_1 UNEMP_{t-k} + \sum_{i=0}^{p} \Delta\alpha_2 GDP_{t-k} +$$

$$\sum_{i=0}^{p} \Delta\alpha_2 GDP_DEF_{t-k} + \sum_{i=0}^{q} \Delta\alpha_3 EX_DEPT_{t-k} + \varepsilon_{t-k}$$

where, α_0 is the constant, $\alpha_1 - \alpha_3$ are the coefficient of the short-run variables, β_1, β_2 and β_3 are the long run parametric elasticities, q reflects clarified ideal lags, p indicates explanator optimal lags, Δ is the first differential indication showing short-run variables, and ε_t is the estimation error term.

The co-integration ARDL approach begins with bound testing and then uses Ordinary Least Squares (OLS) to regress the data. H_0: $\beta_1 = \beta_2 = \beta_3 = 0$ implies that the variables are not co-integrated in the long run, whereas H_1: $\beta_1 \neq \beta_2 \neq \beta_3 \neq 0$ suggests that the factors are co-integrated in the long run. Wald-F statistics and critical values were used to test the null hypothesis. If the Wald F statistic exceeds the upper bound critical values, the null hypothesis is rejected, suggesting that the variables are related in the long run, and vice versa.

This model's empirical assumptions may be defined as follows:

$$UNEMP_t = \beta_0 + \beta_1 GDP_t + \beta_2 GDP_DEF_t + \beta_3 EX_DEPT_t + \varepsilon_t$$

where, $UNEMP_t$ is the dependent variable, where GDP_t, GDP_DEF_t are the explanatory variables in year t, ε_t is the error term, and β_0, β_1, β_2 and β_3 are the elasticities to be estimated.

4. RESULTS

Table 1 provides a statistical explanation of each variable from 1991 to 2019. It can be shown that UNEMP increased at a pace of 19.28% on average. GDP (LGDP) and GDP deflator (GDP_DEF) have mean average values of 24.943 and 106.514, respectively, while external debt has the lowest value of 5.526. Furthermore, the standard deviations for inflation (GDP_DEF) and foreign debt (LEXDEBT) are 36.169 and 1.355, respectively. The GDP and external debt have tendencies in favor, but the unemployment rate and GDP deflator are skewed in the other direction.

In addition, the relationship of the selected indicators provided in Table 2 shows that GDP and inflation are negatively connected with Somalia's unemployment rate, whereas foreign debt is favorably correlated.

Table 1. Descriptive statistics in log form

	UNEMP	LGDP	GDP_DEF	LEX_DEBT
Mean	19.288	24.943	106.514	5.526
Median	19.300	24.907	98.950	5.706
Maximum	19.880	25.276	161.220	8.119
Minimum	18.830	24.551	36.780	3.471
Std. Dev.	0.274	0.244	36.169	1.355
Skewness	0.230	-0.073	0.068	-0.110
Jarque-Bera	0.631	2.931	0.735	1.475
Probability	0.729	0.230	0.692	0.478

Table 2. Correlation

	UNEMP	LGDP	LEX_DEBT	GDP_DEF
UNEMP	1	-0.925	0.145	-0.110
LGDP	-0.925	1	-0.217	0.029
LEX_DEBT	0.145	-0.217	1	0.456
GDP_DEF	-0.110	0.029	0.456	1

Unit Root Test

Testing the unit root is necessary in time series modeling. As a result, the Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests were utilized to decode erroneous regression data. As a result, Phillips-Perron (PP) is employed as a secondary check for the unit root analysis. According to the Augmented Dickey-Fuller (ADF) unit root analysis shown in Table 3, inflation (GDP_DEF) and foreign debt (LEXDB) are stationary at level, but the rest series have unit root but are stationary at first difference I(1). The majority of the series, however, are integrated at the initial difference I(1). According to Phillips-Perron (PP), all variables are non-stationary at level but stationary at first level I(1). This result allows us to estimate our model using the ARDL method.

Table 3. Unit root test

Variable	ADF		PP	
	Level	1st Difference	Level	1st Difference
UNEMP	-0.761	-10.166**	-0.211	-5.503**
LGDP	-0.878	-6.642**	-0.550	-3.407
GDP_DEF	-3.32**	-3.193	-0.550	-7.081**
LEXDB	-3.89**	-6.642**	-0.550	-7.081**

** Symbol shows the three tests ADF and PP are significant at 5% level and first difference of the variables.

Co-integration

Table 4 shows the bounds test findings, which check for long-run co-integration between the unemployment rate and the independent variables. At the 5% significance level, the Wald F-statistics (13.096) are larger than the upper bound critical value (3.67). The variables are co-integrated throughout time.

Table 4. F statistic bound test

F-Statistic	Level of Significance	The Critical Values of Bound Test	
		I(0)	I(1)
13.096	10%	2.37	3.2
	5%	2.79	3.67
	1%	3.65	4.66

Long-run and Short-run ARDL Outcomes with Diagnostic testing

Table 5 shows the long-run estimate results, which show that inflation and GDP are negatively linked with unemployment rate, implying that changes in inflation and GDP caused an increase in unemployment rate in the long run. In contrast, external debt has a positive and 10% meaningful level relationship with the unemployment rate in the first lag. According to the parameter estimate, when foreign debt changes by 1%, the unemployment rate rises by 0.031% in the first lag and 0.018% in the second. GDP, on the other hand, had a negative but negligible impact on the unemployment rate, and was connected with a 0.59% and 0.30% drop in the unemployment rate for the delays, respectively.

According to the diagnostic check results, the ARDL model exhibits none serial correlation, heteroscedasticity, models misspecification, or normality issues The ARDL model coefficients were also demonstrated to be stable during the time frame of the study using the a CUSUM and CUSUM-square tests, as shown in Figures 1 and 2, accordingly.

The calculated coefficients of the first differenced variables are used to calculate the short-run elasticities. The results of the short run dynamics models, as shown in Table 6, show that the lagged unemployment rate is adversely and strongly connected to the current unemployment rate. The findings also demonstrate that inflation is closely related to an increase in the unemployment rate. In the near run, a unit shift in the inflation rate resulted in a negligible rise in the unemployment rate of roughly 0.02%. External debt, on the other hand, was

shown to link with a 3.1% increase in the jobless rate, while GDP also had a positive but minor impact on the unemployment rate. The error correction model (ECM) indicates the pace of adjustment to long-run equilibrium and implies that around 43% of aberrations are correctable.

Table 5. Long run results and diagnostics

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	41.482	2.587	16.033	0.000
LGDP(-1)	-0.592	0.240	-2.459	0.023
LGDP(-2)	-0.302	0.242	-1.247	0.226
GDP_DEF(-1)	-0.0009	0.0008	-1.039	0.311
GDP_DEF(-2)	-0.0007	0.0009	-0.784	0.441
LEX_DEBT(-1)	0.031	0.018	1.728	0.099
LEX_DEBT(-2)	0.018	0.017	1.066	0.298
Diagnostic Results				
	F-statistic		**Prob.**	
Reset test	0.840		0.370	
Serial Correlation	0.531		0.599	
Heteroskedasticity	0.707		0.681	

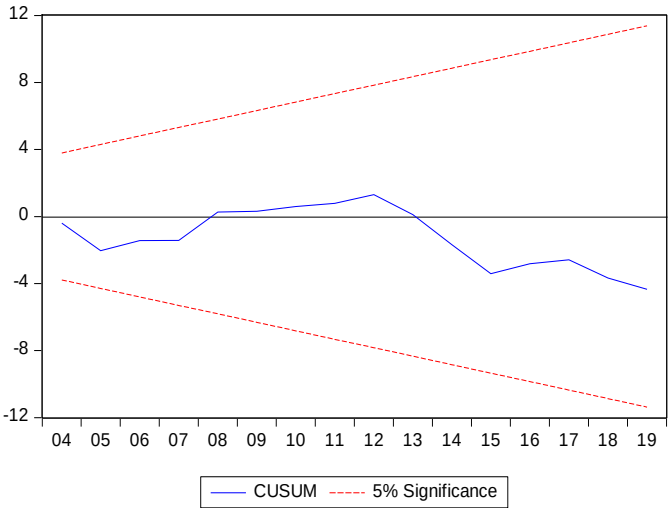

Figure 1. Using the CUSUM test to assess parameter stability

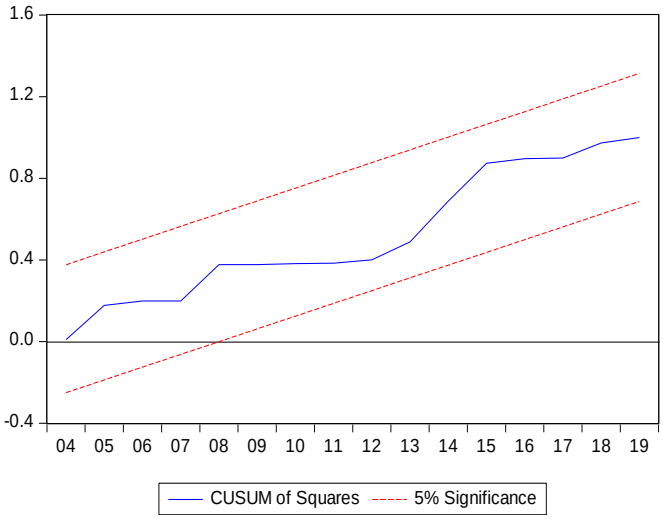

Figure 2. Using the CUSUM of squares test to assess parameter stability

Table 6. Short run ECM result

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	19.192	0.059	320.745	0.000
Δ LGDP(-1)	0.028	0.622	0.045	0.964
Δ LGDP(-2)	0.182	0.702	0.259	0.798
Δ GDP_DEF(-1)	0.0002	0.002	0.112	0.912
Δ GDP_DEF(-2)	0.0005	0.002	0.245	0.809
Δ LEX_DEBT(-1)	0.031	0.036	0.861	0.402
Δ LEX_DEBT(-2)	0.014	0.034	0.427	0.675
Δ ECM(-1)	-0.437	0.646	-0.677	0.508
Δ ECM(-2)	-0.385	0.562	-0.685	0.503

5. CONCLUSION

The topic of whether there is a link between unemployment and inflation is important for a variety of economic concerns. Researchers and economists are interested in this issue since unemployment remains one of the most critical difficulties confronting developing and rising economies throughout the world. When all other parameters remain constant, it is widely assumed that establishing price stability will benefit both growth and unemployment, especially if the ideal threshold can be found. However, achieving the right balance appears to be challenging, and central banks throughout the world are battling to increase employment rates while maintaining price stability. As a result, the goal of this study is to see how changes in the general level of prices impact the unemployment rate in Somalia using annualized data from 1991 to 2019. According to the study's findings, inflation is negatively associated with the unemployment rate in the short run but positively associated with the unemployment rate in the long run, whereas economic GDP was found to be negatively associated with the unemployment rate during the period and external debt was found to be positively associated with unemployment in the long run. In the short run, however, all determinants have a positive influence. We suggest that, rather than relying solely on monetary targeting to achieve a balance between unemployment and inflation levels, economic development-driven output targeting may help attain an optimal inflation rate and a minimum unemployment level.

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