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Factors Affecting Unemployment in Somalia

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Abstract
This study is an attempt to investigate the determinants of unemployment in Somalia. Annual data series is used from the period 1995 to 2014. Unit root test is used to check the stationarity of the variables and employed Ordinary least squares (OLS) regression method. Johansen co-integration technique was applied to determine long run relationship between the variables. Granger causality was used to test bidirectional and unidirectional relationships among the variables. The empirical findings suggest that there are two co-integrating vectors during the concerned period of time in Somalia. The study found a positive relationship ofpopulation growth, external debt and GDP with unemployment and negative with, GCF and exchange rate.
Key terms: *Unemployment, GCF, GDP, Exchange rate, Population growth, and External Debt.*

1. Introduction

Unemployment is the most vital problem all over the world especially in developing countries. In some ways unemployment became inconsistent problem facing in many of the developed and developing countries. When someone needs to work and have the knowledge and the skills to qualify and don't get a job is known as unemployment. Keynesian economics believe that unemployment is there when markets and demand for goods and services are in efficiency.

According to IMF (2008) report stated that unemployment is measured by the annually percentage of labor force which can't find a job but can work. According to the International Labor Organization rules that, a person is jobless and unemployed if the person is not working, presently accessible for work and looking for work.

Generally, most of the people understand only that unemployment is when the people do not have a job. But, unemployment is more complex and broad that concept because employment determines how every society looks like because the less employment the less economic development and the less economic stability in that society. So employment become always an important social factor which indicates how society is developing.

The ILO approach to defining unemployment rests on what can be termed the 'labor force framework', which at any point in time classifies the working age population into three mutually exclusive and exhaustive categories according to a specific set of rules: employed, unemployed, and out of the labor force - where the former two categories constitute the labor force, i.e., essentially a measure of the supply of labor at any given time.

In Somalia, Overall unemployment among people aged 15 to 64 is estimated at 54 per cent in 2012. The unemployment rate for youth aged 14 to 29 is 67 per cent, one of the highest rates in the world. Females experience higher unemployment than males, 74 per cent and 61 per cent respectively. The majority of unpaid family workers are young women who carry out household work due to entrenched traditional gender roles. A high labor force participation rate for youth, estimated at 66 per cent, further reflects lost opportunities for many who might otherwise attend school and acquire skills that could raise their future productivity and employment opportunities (OCHA, 2014).

Somalia have gone through various governmental structures from 1991 till now in 2017, as there had been number of years where country lucked an active regime which can control the extreme rate of unemployment

which is making an increase every year. But, as (Human Development Index, 2012) Indicates there is an urgent necessity to develop, implement and monitor integrated national policy frameworks, including national employment strategies with dedicated action plans on youth employment, as well as coherent sectoral policies. Unemployment in Somalia have enforced a lot of people to leave the country and migrate in search of an improved life through dangerous journeys through deserts and seas. More than 60% of youth have intents to leave the country for better living opportunities.

Less previous unemployment studies have conducted in Somalia like for those of Hamza Sh. & Mahbub Sh. & Ibrahim (2014) studied the effects of unemployment in Mogadishu, Somalia also their study was quantitative approach in which descriptive and inferential methods were analyzed the data. But this study is totally different from their because it is a time series data with the period of 1991 to 2014 and the study intends to identify the causes of unemployment in Somalia under the study period.

According to ILO (2010) defines Unemployment as without a job, want a job, have actively sought work in the last 4 weeks and are available to start work in the next two weeks or out of work, have found a job and are waiting to start it in the next two weeks. Gross Capital Formation is defined as that part of country's current output and imports which is not consumed or exported during the accounting period, but is set aside as an addition to its stock of capital goods (Haryana, 2014).

2. Literature Review

According to (Imran & Sial, 2013) studied the impact of gross fixed capital formation, trade openness and wage proxy on employment in Pakistan. With the use of time series data from 1997 to 2010. To determine the long run relationship study applied cointegration test and to check the properties of time series data the researchers used Unit root test. Results of the study suggests that there are two cointegrating vectors under the study period. Also the findings indicate that there is a positive relationship between gross fixe capital formation and employment. Megbowon & Mushunje (2016) examined the relationship between capital formation, foreign direct investment inflow and unemployment in South Africa from the period of 1980 to 2014. Data in this study was time series data which has obtained from the South Africa Reserve Bank Website and the study used cointegration and causality tests. The findings of study shows that there is a long-run relationship within the variables in the employment model.

Sattar & Bhalli (2013) examined the causes of unemployment in Pakistan with time series data from 1976-2012. Study examined also the relationship amongst unemployment, inflations, external debt, FDI, population growth and gross domestic product. To test the factors that can determine the unemployment in Pakistan, the paper applied Autoregressive Distributed Lag (ARDL). Results of the study shows that population, inflation, gross domestic product, and foreign direct investment were the significant factors that causes unemployment in Pakistan in the long-run and in short-run. (Muhammad, 2013) investigated the relationship between real gross domestic product and unemployment as the Okun's law stated that there inverse relationship among these variables. The paper employed time series data from 1976 to 2010. To examine the relationship between gross domestic product and unemployment the study employed Ordinary Least Squares (OLS) method and unit root test. Results reveal that an increase of one percentage of unemployment will lead a decrease of 0.36% of the real gross domestic product growth.

(Abdul-khaliq, & Shihab, 2014) examined the relationship between unemployment and economic growth rate in some of the Arab countries. The general aim of the paper was to identify the relationship between unemployment and economic growth rate in some Arab countries. Pooled data of 1994-2010 was used. The study found the economic growth has negative and significant impact on the unemployment rate. This indicates that if economic growth increases 1% then the unemployment will decrease 0.16% under the study period.(Bakare, Akoko, & State, 2011) investigated the determinants of urban unemployment in Nigeria. They used time series data from 1978 – 2008. To test the stationarity of the variables Unit root test was used and OLS regression was also employed. The findings indicated that the growth of the population has an effect to the unemployment which means that population causes high unemployment in Nigeria under the study period.

(Ogonna, Idenyi, Ifeyinwa, & Gabriel, 2016) studied the implications of rising public debt on unemployment in Nigeria. Annual data series from 1980-2015 was used. Econometric analytic tools including auto regressive model were used. The results showed that there is a long run relationship between external debt and unemployment. Also the ARDL model indicated that 1% increase in public debt on the average, will cause about 1.6% increase in unemployment rate.

3. Research Methods

3.1: Research Design

The method of analysis used in this study is the Ordinary Least Square (OLS) technique. The OLS is a statistical technique used for fitting a regression line (that is choosing or estimating the structural parameters) to sample of some observations in such a way as to minimize the sum of squares of the deviations of the actual observation from the line. It has been chosen for this analysis. (Gujarati, 2004)

This regression technique has been employed and found to be suitable here due to its unique properties of linearity, efficiency, sufficiency, least variances, un-biasedness and least mean errors. The statistical properties of OLS are based on the assumptions of CLRM and are enshrined in the famous Gauss–Markov theorem. But before we turn to this theorem let's provide the theoretical justification for the popularity of OLS, we first need to consider the precision or standard errors of the least-squares estimates. In addition, it is one of the most commonly employed methods in estimating relationships in econometric models and its use, in a wide range of economic relationships, has provided fairly satisfactory results.

3.2: Model Development

The model is structured in a simple way and is used to investigate the disparities in unemployment rate in Somalia under the study period.It is needed to specify a model to show the determinants of unemployment in Somalia. In this study the researchers proposed the following mathematical outward. So the functional relationship among gross domestic product, gross capital formation, population growth, external debt, exchange rate and the unemployment of Somalia is expressed as the following way:

$$UN = F(GDP, GCF, POP, ED, ER) \quad (1)$$

Where UN is unemployment, F is a function of unemployment,GDP is gross domestic product,GCF is gross capital formation, POP is population growth, ED isexternal debt, and ER is anexchange rate. Model can be written in linear form as follows:

$$Y = \beta 1 + \beta 2\, GDP + \beta 3\, GCF + \beta 4\, POP + \beta 5\, ED + \beta 6\, ER + U \quad (2)$$

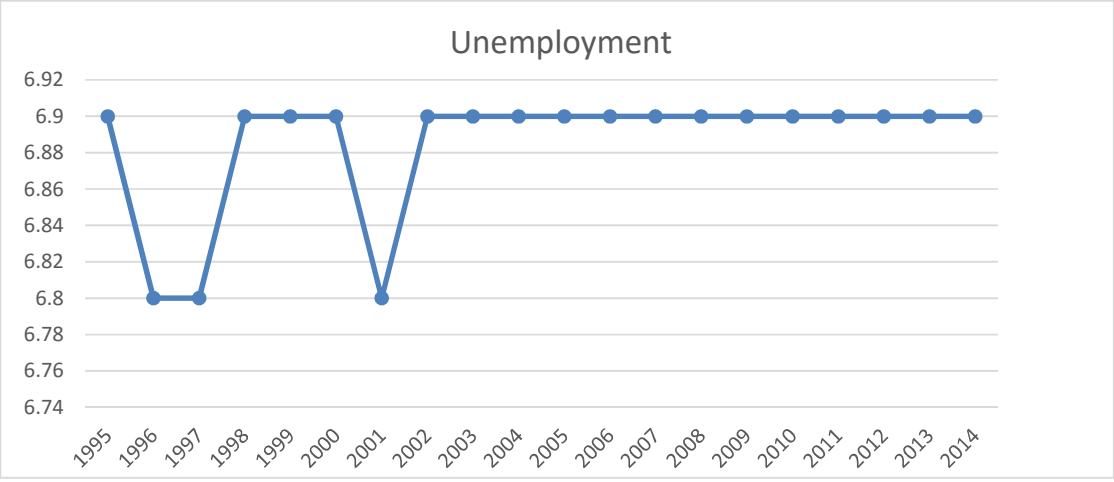
Where:
Y = Unemployment
GDP = Economic growth
GCF = Gross capital formation
POP = Population growth
ED = External debt
ER = Exchange rate
β1, β2, β3 = slope of the regression equation
U = Stochastic error term.

4. Data Analysis

4.1 Trend Analysis

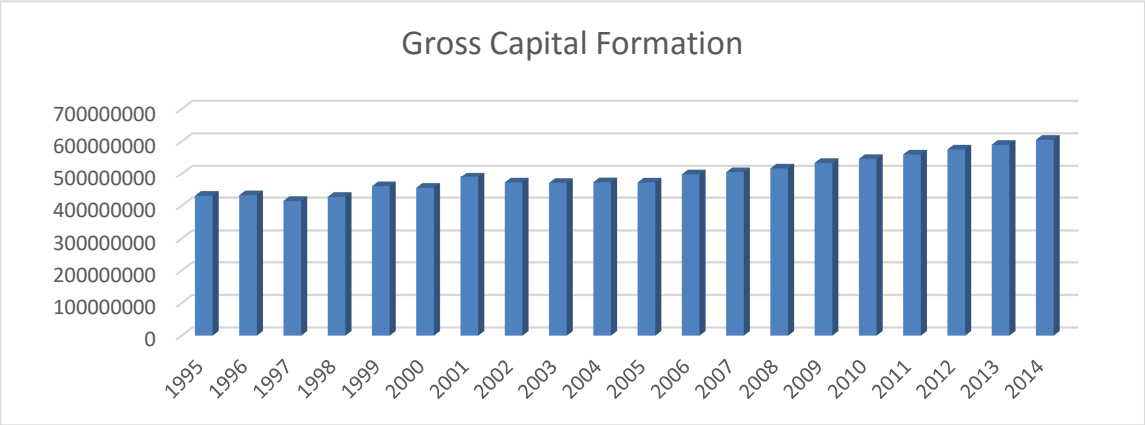
In Somalia unemployment is the major socioeconomic factor which caused many sub-problems including migration, terrorism and robbery. In 1996, 1997 and 2001 it was the years that Somalia experienced the lowest rate of unemployment but the remaining years of under study shows that unemployment was the same rate.

Figure 4.1: Unemployment rate



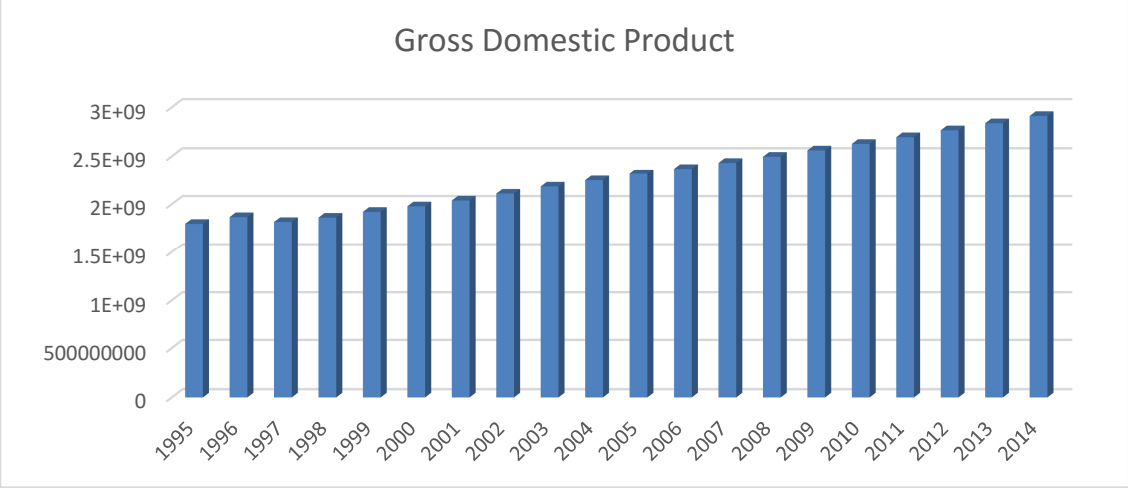
As the trend shows, the capital formation of Somalia has made dramatic growth which will have positive effect if it is utilized to the proper way to the unemployment.

Figure 4.2: Gross Capital Formation



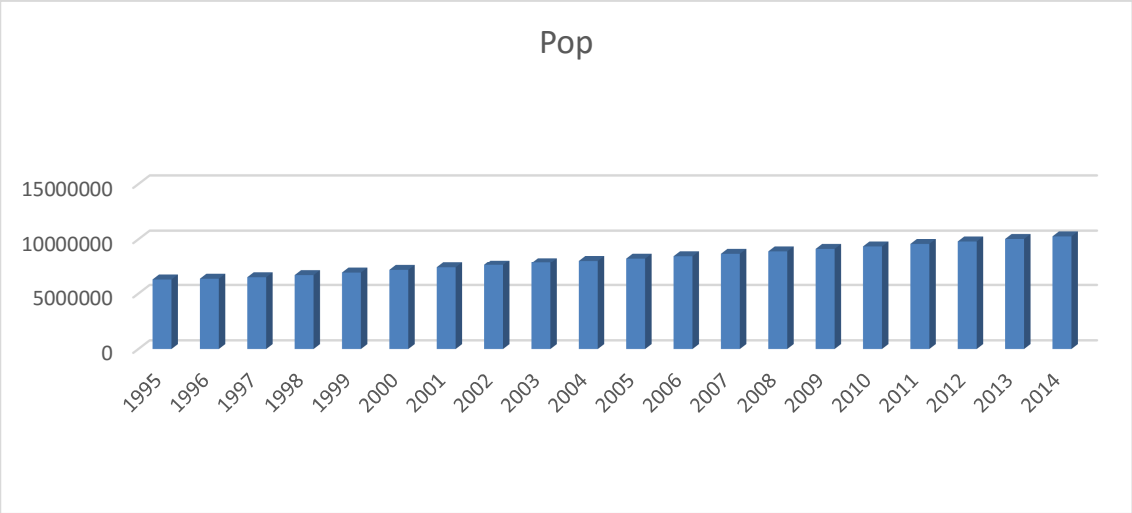
Somalia's economic growth increased every year for example in 2016 3% was increased the real gross domestic product (GDP). The graph shows that GDP has made an increase in the whole years of the study.

Figure 4.3: Gross Domestic Product



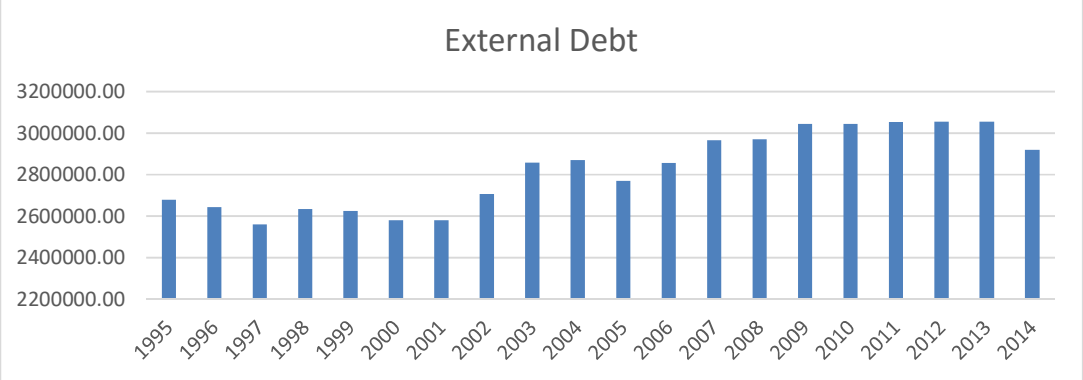
In the year of 1995 the population of Somalia was around six million but now it is almost thirteen million and the graph shows that trend of population growth. Population growth has a positive impact on unemployment in Somalia under the sample years.

Figure 4.4: Population Growth



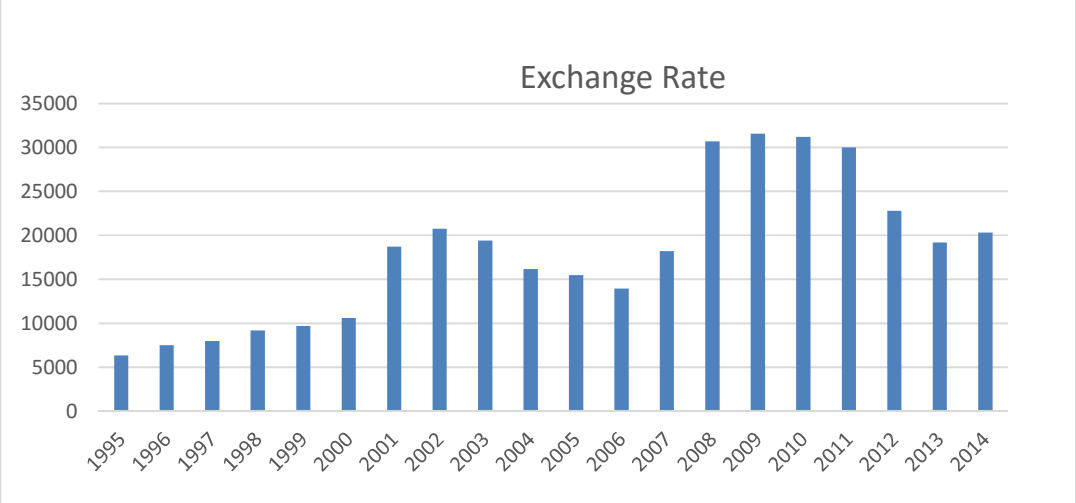
As International Monetary Fund (IMF) indicated that Somalia ha owed around 5.3 billion which needs to pay back. External debt in generally has a negative impact on the economic growth but when it is using a development and productive programs it will have a positive effect especially unemployment. From 2003 to 2014 the foreign debt was increased as a result of the government borrowing.

Figure 4.5: External Debt



The highest periods in which the exchange rate increased was in 2008 to 2011 but in 2012 till now the exchange rate of Somalia is constant with around 21 thousand of Somali Shillings.

Figure 4.6: Exchange Rate



4.2 Unit Root Test

The table below shows the order of integration of the variables. The unit root test was applied to examine the order of integration. The Augmented Dickey Fuller and Philip Parron tests have been used under the assumption of intercept and trend. Results show that the unemployment series are not stationary at level, but the first differences, I (1) of the series are stationary. This type of testing is useful to avoid the chances of spurious regression as Quattara (2004) and shows that the bound testing is depending on the assumption of I (0) and I (1). AIC is used to find optimum lag length. We have taken the optimal lag length as 1.

	ADF		PP	
Variables	**Constant without trend**	**Constant with Trend**	**Constant without trend**	**Constant with Trend**
Level				
UN	-3.081002	-3.710482	-3.029970	-3.673616
GDP	-3.040391	-3.690814	-3.029970	-3.673616
ED	-3.029970	-3.690814	-3.029970	-3.673616
GCF	-3.081002	-3.759743	-3.029970	-3.029970
ER	-3.040391	-3.759743	-3.029970	-3.673616
POP	-3.052169	-3.710482	-3.029970	-3.673616
1st Difference				
ΔU	-3.081002*	-3.759743*	-3.040391*	-3.690814*
ΔGDP	-3.040391*	-3.690814*	-3.690814*	-3.690814*
ΔED	-3.052169*	-3.710482*	-3.040391	-3.690814
ΔGCF	-3.081002	-3.759743	-3.040391*	-3.690814*
ΔER	-3.098896*	-3.791172*	-3.040391*	-3.690814*
ΔPOP	-3.065585*	-3.065585*	-3.040391*	-3.690814*

4.3 Ordinary Least Squares (OLS) Regression Analysis

The below output is the regression results of the determinants of unemployment in Somalia under the period of 1995-2014. As indicated by the adjusted R-square shows a good fit of the model. An adjusted R-squared value of 0.387291 or 38.73% and showed that the model fits the data well, the total variation in the observed behaviour of unemployment is jointly explained by variation in total other explanatory variables in the study up to %. The remaining 3% is accounted for by the stochastic error term which means the other variables not mentioned in the model and that have an effect on the model.

Dependent Variable: LOG(UN)
Method: Least Squares
Date: 08/15/17 Time: 17:09
Sample: 1995 2014
Included observations: 20

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.955182	0.509528	3.837244	0.0018
LOG(ED)	0.101450	0.043741	2.319337	0.0360
LOG(ER)	-0.008575	0.004397	-1.950221	0.0715
LOG(G_C_F)	-0.007838	0.035605	-0.220143	0.8289
LOG(GDP)	-0.243904	0.101316	-2.407345	0.0304
LOG(POP)	0.249091	0.092279	2.699333	0.0173

R-squared	0.548531	Mean dependent var	1.929332
Adjusted R-squared	0.387291	S.D. dependent var	0.005348
S.E. of regression	0.004186	Akaike info criterion	-7.870643
Sum squared resid	0.000245	Schwarz criterion	-7.571924
Log likelihood	84.70643	Hannan-Quinn criter.	-7.812330
F-statistic	3.401970	Durbin-Watson stat	2.406732
Prob(F-statistic)	0.032109		

4.4 Model Diagnostic Test

The model assumption tests for model as presented in the below table shows that the residuals are normally distributed, therefore the Jarque-Bara of the null hypothesis of normal distribution of residual is accepted. Also the null hypothesis which denotes that there is no serial correlation is also accepted. Because of the Breusch-Godfrey Serial Correlation test of the model is greater than 0.05 and finally, The Breusch-Pagan-Godfrey test of Hetroskedasticity also specifies no evidence of Hetroskedasticity.

Normality Test			
Jarque-Bera	3.3657	Probability	0.185
Breusch-Godfrey Serial Correlation LM Test			
F-statistic	2.0717	Probability	0.168
Obs*R-squared	5.1333	Probability	0.076
Breusch-Pagan-Godfrey Heteroskedasticity Test			
F-statistic	1.5480	Probability	0.238
Obs*R-squared	7.1206	Probability	0.211

4.5 Correlation Matrix of the Variables

Correlation coefficient shows the degree of linear relationship between two variables. A Correlation Matrix is a table which shows all possible correlation coefficients between a set of variables. Correlation matrix of the variables of our model is given in following table.The results of the below table of correlation describes that there is strong positive correlation of UN with ED, POP and GDP. There is weak positive association of UN with GCF and ER. Above table also shows that there is strongpositive correlation of GCF with GDP, POP, ED and ER. The correlation between GDP, POP, ED and ER is positively strong.There is positivestrong association of POP with ED and ER. Finally, there is relatively strong positive correlation between ED and ER.

4.8 Correlation matrix

	UN	GCF	GDP	POP	ED	ER
UN	1.0000					
GCF	0.3872	1.0000				
GDP	0.4565	0.9700	1.0000			
POP	0.4760	0.9674	0.9973	1.0000		
ED	0.5348	0.8358	0.9078	0.9016	1.0000	
ER	0.3467	0.7264	0.7594	0.7766	0.8004	1.0000

4.6Pairwise Granger Causality Tests

As the table below shows, the optimum lag selected is 1. The first null hypothesis of the test is ER does not Granger cause ED, and can be rejected because the p-value is less than the 5% significance level, meaning that we accept the alternative hypothesis, which is that ER does Granger cause export ED. On the other hand, the findings show that ED does not Granger cause ER, so there is a unidirectional causality between ED and ER. UN does not Granger cause ER, but ER does Granger cause UN. In the same way, there is Granger causality between POP and GDP in both directions, and IM also does not Granger cause GDP, but as the result shows, GDP does Granger cause IM. Also, UN does Granger Cause GDP, but GDP does not Granger Cause UN. POP does Granger Cause G_C_F but G_C_F does not Granger Cause POP. UN does Granger Cause G_C_F but G_C_F does not Granger Cause UN. In addition to that UN does not Granger Cause POP but POP does Granger Cause UN.

4.9 Pairwise Granger Causality Tests

Null Hypothesis:	Obs	F-Statistic	Prob.
ER does not Granger Cause ED	19	9.31828	0.0076
ED does not Granger Cause ER		0.04180	0.8406
GDP does not Granger Cause ED	19	1.69433	0.2115
ED does not Granger Cause GDP		0.11737	0.7364
G_C_F does not Granger Cause ED	19	0.32151	0.5786
ED does not Granger Cause G_C_F		0.45256	0.5107
POP does not Granger Cause ED	19	2.90611	0.1076
ED does not Granger Cause POP		9.03360	0.0084
UN does not Granger Cause ED	19	0.03252	0.8592
ED does not Granger Cause UN		2.94911	0.1052
GDP does not Granger Cause ER	19	0.13606	0.7171
ER does not Granger Cause GDP		0.53470	0.4752
G_C_F does not Granger Cause ER	19	0.09163	0.7660
ER does not Granger Cause G_C_F		0.00377	0.9518
POP does not Granger Cause ER	19	0.26498	0.6138
ER does not Granger Cause POP		0.05437	0.8186
UN does not Granger Cause ER	19	0.10088	0.7549
ER does not Granger Cause UN		4.83573	0.0429
G_C_F does not Granger Cause GDP	19	0.37439	0.5492
GDP does not Granger Cause G_C_F		4.00254	0.0627
POP does not Granger Cause GDP	19	26.5370	0.0001
GDP does not Granger Cause POP		17.5976	0.0007

UN does not Granger Cause GDP	19	5.55799	0.0315
GDP does not Granger Cause UN		4.21790	0.0567
POP does not Granger Cause G_C_F	19	5.52553	0.0319
G_C_F does not Granger Cause POP		0.40723	0.5324
UN does not Granger Cause G_C_F	19	5.47711	0.0326
G_C_F does not Granger Cause UN		3.02789	0.1010
UN does not Granger Cause POP	19	0.04225	0.8397
POP does not Granger Cause UN		5.39948	0.0336

4.7Johansen Test of Co-integration

In the table below, the trace statistics shows that there is at least one cointegrating equation, meaning that the variables have long-term associations or relationships. Also, the max-eigenvalue test indicates similarly that there is at least one cointegrated equation. When the model variables are cointegrated, the VECM model, rather than the unrestricted VAR model, can be applied. UN, GCF, POP, GDP, ED and ER have a long-run relationship.

Johansen Test of Co-integration
Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.954093	113.9065	69.81889	0.0000
At most 1 *	0.837545	58.44589	47.85613	0.0037
At most 2	0.555982	25.73350	29.79707	0.1369
At most 3	0.384520	11.11948	15.49471	0.2043
At most 4	0.124006	2.383123	3.841466	0.1227

Trace test indicates 2 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.954093	55.46061	33.87687	0.0000
At most 1 *	0.837545	32.71239	27.58434	0.0100
At most 2	0.555982	14.61402	21.13162	0.3169
At most 3	0.384520	8.736354	14.26460	0.3088
At most 4	0.124006	2.383123	3.841466	0.1227

Max-eigenvalue test indicates 2 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

As already mentioned and verified by the Johansen test of co-integration, the variables have long term association therefore, a Vector Error Correction Model (VECM) is used in this study in order to check both long run and short run causality of the variables. The results are shown below. The following tables show the statistical significance of the VECM model variable coefficients by using the Wald Test.

The coefficient, C (1) of the Co-Integrated Equation (CE) is significant and negative meaning that there is long run causality of the independent variables: ED, GDP, G_C_F, POP and ER on UN.

4.8 VECM Model and the Wald Test

D(UN) = C (1) *(UN (-1) + 6.90394917065E-06*ER (-1) - 2.02559833725E-07 *ED (-1) + 7.39858677957E-09*GDP (-1) - 2.19327377208E-06*POP (-1) - 5.47317057294) + C (2) *D (UN (-1)) + C (3) *D (ER (-1)) + C (4) *D (ED (-1)) + C (5) *D (GDP (-1)) + C (6) *D (POP (-1)) + C (7)

	Coefficient	Std. Error	t-Statistic	Prob.
C (1)	-0.388170	0.172327	-2.252526	0.0457
C (2)	-0.206483	0.209396	-0.986089	0.3453
C (3)	1.71E-06	1.84E-06	0.927865	0.3734
C (4)	-1.16E-09	1.54E-07	-0.007511	0.9941
C (5)	1.00E-10	5.98E-10	0.167924	0.8697
C (6)	-1.84E-06	8.70E-07	-2.116532	0.0579
C (7)	0.382837	0.154011	2.485778	0.0303

R-squared	0.639563	Mean dependent var	0.005556
Adjusted R-squared	0.442961	S.D. dependent var	0.041618
S.E. of regression	0.031061	Akaike info criterion	-3.820407
Sum squared resid	0.010613	Schwarz criterion	-3.474151
Log likelihood	41.38366	Hannan-Quinn criter.	-3.772663
F-statistic	3.253084	Durbin-Watson stat	2.592045
Prob(F-statistic)	0.043203		

In the tablebelow, the Wald test shows that the coefficient C (2), C (3), C (4), C (5) and C (6) of the independent variables, ED, ER, GDP, POP and G_C_F, are statistically significant because their Chi-square value is 19.48863 and its corresponding P-value is 0.0016, meaning that they all have short-run causality on UN.

Wald Test:

Equation: Untitled

Test Statistic	Value	Df	Probability
F-statistic	3.897727	(5, 11)	0.0281
Chi-square	19.48863	5	0.0016

Null Hypothesis: C(2)=C(3)=C(4)=C(5)=C(6)=0

Null Hypothesis Summary:

Normalized Restriction (= 0)	Value	Std. Err.
C(2)	-0.206483	0.209396
C(3)	1.71E-06	1.84E-06
C(4)	-1.16E-09	1.54E-07
C(5)	1.00E-10	5.98E-10
C(6)	-1.84E-06	8.70E-07

Restrictions are linear in coefficients.

5. Discussion

In this research paper, a regression analysis was conducted on the following variables: unemployment as the dependent variable, and GDP, ER, ED, G_C_F and POP as the independent variables. The fitness of the model is shown by the adjusted R-square, which is equivalent to 0.387291, or 38.72%. The implication is that 38.73% of the variation in the economic growth of Somalia is explained by the above-mentioned variables, while the remaining of the variation is due to the stochastic or error term, which is meant to include any variable that affects economic growth that is not mentioned in the model.

To test for the overall significance of the model, the ANOVA of the F-statistics is used. To test for the individual statistical significance of the parameters, the t-statistics of the respective variables were considered through the computation process of the E-views software. This indicates that one of the coefficients is

statistically significant at the 5% level of significance. The POP, ED and GDP coefficients are significant, but the ER and G_C_F coefficients are insignificant at the 5% level of significance. Both are negatively related to the dependent variable.

The importance of the independent variables and their effect on unemployment is supported by the literature because they all play a good role in understanding the overall economic wellbeing of every country.

In this paper, the relationship between POP, ED, ER, G_C_F and GDP and UN in the context of the Somali economy was analyzed using the vector auto-regression model. The period of the regression analysis was from 1995 to 2014, a time interval in which there was comparable data for the determinants of unemployment. In this research paper, the focus was to determine which variables Granger cause unemployment. Thus, an unrestricted VAR was used to investigate these relationships in terms of Granger causality. We then found some of the variables had bidirectional causality and some were unidirectional. In addition, we ran the Johansen test of cointegration and found that there is long-term association among all the variables.

6. Conclusion and Policy Recommendations

The paper attempted a time series analysis which includes the long-run cointegration test and causality relationship to investigate the determinants of unemployment in Somalia for the period of 1995-2014. Applying the Johansen co-integration test, existence of long run relationship was confirmed for the unemployment model. After data analysis the paper suggested that external debt, gross domestic product and population growth has positive significant relationship with unemployment. While exchange rate and gross capital formation has insignificant relationship with unemployment. Furthermore, this paper gives insights into possible solutions which focuses on how unemployment should be reduced. Here are some of the recommended policies:

- The government should consider policies that promote foreign debt and utilizing it to create more local investments.
- Also the government should borrow debt for only productive purposes and projects
- It is to ensure to apply labour rights that are based on international labour standards
- It is to increase aggregate demand and improve access to finance
- It is helpful to target employment of disadvantaged youth in labour market policies.

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