External Debt Stock and Economic Growth in Somalia (1990-2016)

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ABSTRACT

Somalia has an estimated 5.5 billion dollars outstanding, due to many reasons, but the socio-economic indicators of the country show that it has contributed a little or almost nothing to the overall GDP, and continues to dwindle. Thus, this study investigates the relationship between the external debt stock and economic growth in Somalia (1990 to 2016) using the Error Correction Model (ECM). The Augmented Dickey-Fuller (ADF) and Kwiatkowski- Phillips-Schmidt-Shin (KPSS) unit root tests were carried out on all variables to ascertain their stationarity in which all of them were found to be stationary at first difference. Co-integration results of Trace and Maximum Eigen-value showed that there is a long run relationship between external debt stock and economic growth in Somalia for the period 1990-2016. The ECM result showed that external debt stock negatively affects economic growth. This implies that when external debt increases economic growth reduces. Thus, the study concluded that the problem of high external debt stock is associated with inadequate debt management; borrowing for social and political reasons; poor performance of export sector to increase foreign exchange earnings, and lack of transparent loan cycles to make projects compete for the scarce resources. Based on the above-mentioned results, the study recommends that the government should further promote the rational and proper utilization of resources while increasing the concessional ability of newly acquired debt inflows. To this end, measures should be taken to encourage non-borrowed funds, such as Foreign Direct Investment (FDI), portfolio investment and non-government guaranteed private debts.

Keywords: External Debt, Economic growth, Error Correction Model (ECM)

JEL Classification: C32, C53, E51, F31

1. Introduction

The accumulation of external debt is a common phenomenon of both developed and developing countries and has become a feature of the fiscal sectors of most of these economies. The desire to finance high fiscal debt of these economies faced by resource gap- investment and savings gaps; compel them to supplement their domestic savings by foreign resources. Were (2001) argues that the process of economic expansion necessitates capital accumulation. The effects of external debt accumulation on macroeconomic variables remain questionable to both policymakers and academician alike. It has both positive and negative aspect; different experts are of the view that external debt has a favourable effect on economic growth, as an increase in capital inflow accelerates the pace of economic growth. On the other hand, external debt accumulation beyond certain limits; will contract economic growth by hampering investment.

In Africa, external indebtedness expanded phenomenally for the period 1990 to 2016. For instance, Africa's external debt stock grew rapidly, by 10.2 percent per year in 2005-2015, compared with 7.8 percent per year in 2006-2009. The annual average growth rate of Africa's external debt stock exceeded 10 percent in eight heavily indebted poor countries and 13 non-heavily indebted poor

countries (IMF, 2015). In 2005-2015, the external debt stock grew most rapidly in Mozambique (average by, 30 percent per year), Cameroon (26 percent per year) and Gabon, Nigeria, Rwanda and Seychelles (24 percent per year each). The concessional share of total external debt was less than 50 percent on the average in only seven of the heavily indebted poor countries in Africa, namely Côte d'Ivoire (27 percent), Zambia (39 percent), the Sudan (40 percent), Liberia (40 percent), the Central African Republic (43 percent), Ghana (45 percent) and the Democratic Republic of the Congo (48 percent). In contrast, as of December 2015, this concessional share of total external debt in the period 2011-2013 was less than 50 percent for 11 of 16 non-heavily indebted poor countries. The weighted share of concessional debt in total external debt in Africa fell from 42.4 percent in 2006-2009 to 36.8 percent in 2011-2013 (African Development Bank, 2015).

Further, according to Iyoha (1999), the period 1990-1999 was regarded as Africa's "Lost Decade" of development opportunities, this is because most of the African countries had deteriorated economic conditions. Shreds of evidence showed that there was a massive decrease in most of the economic performance indicators. In the case of Sub Saharan Africa, the GNP per capita decreased at an average rate of 2.2%, private consumption per capita dropped by 14.8%, export volume dropped sharply while the import volume was reducing at an annual rate of 4.3%, terms of trade dropped by 9.1%. On connecting these stylized facts with the real GDP growth rate in most of SSAs the data shows that between 1981 and early 1990s the growth rate was at an average of 1.7% which gave about -0.9% in real GDP per capita. Iyoha (1999) pointed out further that, the real GDP performance of SSA remained poorly at negative digits until 1995 only when the growth rate became positive at 1.1% this was the poorest compared to the performance by other continents such as in East Asia where the GDP growth was at an average of 8.0% with China topping with an average of 9.2% during the period.

For the countries located at the horn of Africa, the situation was not exceptional, for example, In Somalia; the decline in the foreign exchange earning capacity of the economy was aggravated by the notoriously prolonged civil wars. This adversely affected Somalia's ability to service its debt and led to the rapid accumulation of arrears. The urgent need to rehabilitate the war-torn economy forced the government to resort to external financing, which led to a sharp rise in the stock of debt in 1987. By June 1993, the stock of debt outstanding and disbursed stood at US$2.5 million with arrears of US$253 million, this stock of arrears, which had been reduced from the June 1984 level of US$149.3 million, had caused legal actions against the government from some quarters and greatly jeopardized the government's ability to manage its economic stability effectively (World bank, 2008). External debt was estimated at US$5.3 billion (93 percent of GDP) at end-2014, mainly arrears. Debt data covers most creditors, excludes commercial debt, and shows obligations to (i) multilaterals (US$1.5 billion); (ii) Paris Club creditors (US$2.3 billion); and, (iii) Non-Paris Club creditors (US$1.5 billion). Based on a preliminary assessment, Somalia lacks the ability to service its debt in the medium term (IMF Article IV, 2015).

Somalia's Gross Domestic Product (GDP) was estimated to be $5.4 billion in 2013, and then again $6.2 billion in 2016, with 5% nominal growth. Its GDP per capita was equally low, at $450; Somalia has a poverty rate of 51%. Private consumption is GDP's key driver, contributing 132.6% of it; in sharp contrast, the investment made up only 8% of GDP in 2015, (Federal Government of Somalia, Ministry of Finance, 2016).

Economic activity is estimated to have expanded by 3.7 percent in 2014, driven by growth in agriculture, construction, and telecommunications, because that was the beginning of the recovery stage. Consumer price inflation was 1.3 percent. For 2015, real growth was projected at 2.7 and inflation should remain subdued at about 4percent. With modest progress on the security front and an absence of drought, medium-term annual growth should be about 5 percent. Nevertheless, growth will remain inadequate to redress poverty and gender disparities (IMF Article IV, 2015).

Somalia's economy is highly dependent on imports, which account for more than 2/3 of GDP, while exports comprise just 14%, creating a large trade deficit, mainly financed by remittances and international aid (IMF &World Bank, 2015). Public expenditure has increased significantly, from $35.1 million in 2012 to $170.5 million in 2016, driven by year-on-year increases in revenue. An improvement in revenue collection means that domestic revenue grew from $84.3 million in 2014 to $112.7 million in 2016, driven by taxes on trade. However, total revenue to GDP accounts for only 2.7% of GDP (FGS, Ministry of Finance, 2016).

In addition, International actors opined that high levels of debt in Somalia led to a reduction in private investment, thus lower growth rates, and that debt overhang is a significant factor influencing slowdown in private investment (FGS, Ministry of Finance, 2016). In this context, debt is considered to imply a future tax on the output which leads discouragement of private sector investment plans and adjustment efforts on the part of governments. Furthermore, they argued that it is more likely that these debt servicing obligations will be financed through distortionary measures, like, inflationary taxes, cuts in productive public investment, etc. which will hinder the revival of Somalia; economically, politically and socially.

Thus, since Somalia was in a situation of statelessness and civil conflicts for almost three decades, there was no functional central government to monitor and control the external debts received from foreign countries and institutions, which made Somalia fall in the debt trap and remained the frontrunners of the Heavily Indebted Poor Countries initiative. Consequently, this study examines the level of the external debt stock in Somalia and its effects on the economic growth rate of the country for the period 1990-2016. The outline of the paper is presented as follows: following the introduction Section 1, Section 2 provides a review of existing literature. Section 3 focuses on the theoretical framework and methodology adopted for the study. Section 4 dwells on the empirical analysis and discussion of results, while Section 5 concludes.

2. Review of Literature

The theoretical relationship between external debt and economic growth has been discussed extensively; however, two theories stand out in analysing the core reasons why nation embark on borrowing. These theories are the Dual Gap theory developed by Chenery 1966, and Debt Over-Hang theory postulated by Krugman 1988. Dual gap theory is a better explanation of the reason why nations opt for external finance as opposed to domestic financing in financing sustainable development. As per the theory, developing countries' level of home savings is not satisfactory to back the desired investments to guarantee economic prosperity; since investment is a function of savings it is rational to necessitate the use of harmonizing external goods and services. Hence, the relationship between home savings and foreign funds gives a guide as to how much a country can borrow from abroad. Also since most of LDCs are far from their steady state growth any investment injection could lead them to have accelerated economic growth. On the other hand, according to Chenery 1966, economic growth can be achieved by borrowing from external institutions and/or countries if the domestic sources are not enough in the process of improving the Gross Domestic Product and hence, economic growth.

Krugman (1988) who is the champion of debt over-hang theory provides an up-front definition of the issue of debt overhang that is when the repayment capacity of the country is less than the debt itself. In the paper, Krugman shows that the choice between supplementary financing and debt cancellation to be somewhat of a clash. Financing could create for any creditors an option value that is to say that in the event of the country has exceeded expectations the creditors would not have had to write down unnecessarily any claims. On the other hand from the perspective of the country, there could be an inducement distortion as debtors are more probable to be compensated than the country itself, which diverts the scarce funds to now clear the accumulated debts (Krugman, 1988).

The empirical literature on the relationship between external debt and economic growth also turn out to be controversial as some findings indicate that it promotes growth while some conclude otherwise. For instance, Krumma, (1985) determined the impact of external debt on Gross Domestic Production in 19 Transitional economies adopting the panel autoregressive distributed lag (ARDL) model. It was found that external debt has a positive impact on GDP growth, also the openness of the economy has a positive impact in the long run, while external debt to export ratio has a negative impact on growth rate of the transitional economies in the short run.

Ihimodu, (1985) studied the impact of external debt stock on economic growth in Nigeria. The variance decomposition and impulse response from Vector Auto-Regression (VAR) was the econometric technique used to test whether or not Ratio of External debt to Exports and other economic control variables stimulate economic growth. Based on the two-stage data processing, the result revealed weak causation between external debt and economic growth in the Nigerian context.

This implies that external debt could not be used to predict improvements or slowdowns in economic growth in Nigeria.

Cohen (1993), regressed investment as a percent of GDP on many variables including the debt to export ratio and found out that the debt to export ratio had a negative effect on investment and therefore economic growth. This is similar to the empirical conclusions of Sachs (1989) and Krugman (1988). But some researchers argue that debt burden reduces economic growth due to the negative impact on the productivity of labour. Geiger (1990) studied the effect of debt burden on capital flows and GNP growth rate using data from nine Highly indebted Latin American countries for the period1974 to 1986. The debt burden was measured by the ratio of debt service to GDP. The findings from the OLS and distributed lag model regressions highlighted that there was a significant negative relationship between debt and economic growth. The reduction in labour and capital productivity was the main channel of the negative effect of debt on economic growth.

Warner (1992) used pooled panel regression with data spanning from 1961 to 1989 and debt crisis dummy variable was included to capture the impact of external debt on heavily indebted countries' economic growth. The findings show that the coefficient for debt crises was positive and significant rather than the negative sign predicted by some studies. Warner (1992) argued that the debt crisis did not depress investment as the borrowed funds were used in public investments and thus encouraging economic growth. But the pooled OLS regressions used have weakness since the method ignores country-specific effects and this study used a more robust dynamic GMM estimation.

Chowdhury (1994) examined the cause-effect relationship between external debts and decline in economic growth. Logarithmically transformed time series data on GNP were used in the regression and causality test was carried out. The result indicates that there was a positive relationship between economic growth and external debt in Bangladesh, Indonesia, and South Korea for the period 1970-1988. Similarly, Amoateng et al. (1996) used Granger Causality test to determine the relationship between external debt and GDP growth rates of 35 developing countries with data ranging from 1971 to 1990 and the findings indicate that there was positive causality between foreign debt and GDP growth rate. Hansen (2001) also scrutinized the influence of external borrowing on growth and investment and the findings show that external debt positively influenced investment and GDP per capita growth rates. Hansen (2001) concluded that the impact was through investment and this implies that if external loans were put in a productive venture, the increased investment will lead to further growth.

Ayadi & Ayadi (2008) examined the impact of the huge external debt, with its servicing requirements on economic growth of the Nigerian and South African economies. The Neoclassical growth model which incorporates external debt, debt indicators, and some macroeconomic variables were employed and analysed using both Ordinary Least Square (OLS) and Generalized Least Square (GLS) techniques of estimation. Their findings revealed that debt and its servicing requirement has a negative impact on the economic growth of Nigeria and South Africa.

Malik (2010) investigated if there can be any relationship between external debt and Gross Domestic Production in Pakistan for the period of 1972-2005, using time series econometric technique. He found that external debt is negatively and significantly related to economic growth. He also found that debt servicing has a significant and negative impact on GDP growth.

In the empirical study by Alam, & Taib, (2012), on the impact of external debt on sustainable economic growth in Nigeria for the period of 1980-2010, using the ordinary least Square regression method, the study found that a 12.3 percent change in economic growth is as a result of external debt and prime lending rate in Nigeria. It, therefore, recommends that the government should through an act of its political-will address the fundamental causes of external debt and also ensure adequate utilization of borrowed funds to develop the different sectors of the economy so as to enhance the economic growth of the nation.

Ayyoub, Chaudhry, & Yaqub, (2012) studied the long-run and short-run relationship between external debt stocks and macroeconomic performance of Pakistan. They applied time-series econometric techniques with annual data series for the entire period of 1988-2008. The co-integration approach was employed to investigate the long-run relationship, and vector error correction method (VECM) to investigate the short term dynamics. The study found that there were a significant long-run and short-run relationship between external debt and macroeconomics variables performance.

Sulaiman & Azeez (2012) investigated the effect of external debt stock on economic growth in Ghana using GDP as the dependent variable while the ratio of external debt to export, inflation and exchange rate were used as the independent variables. Annual time series data covering the period of 1970 to 2010 were used, which were analysed using the ordinary least squares, ADF, unit root test, Johansen co-integration test and Vector Error correction model (VECM). Results from the study showed that external debt has a positive impact on the Nigerian economy in the long run. They, therefore, recommended that external borrowing should be obtained for economic growth reasons rather than social and political motives.

Babu (2014) estimated the effect of external debt as a share of GDP in economic growth in the East Africa Community (EAC). Using annual data from 1970-2010, the study employs a panel fixed-effects model which was based on the Solow growth model augmented for debt. The findings suggest a negative significant effect of external debt on GDP per capita growth rate. Reduction of external debt burden was therefore recommended to promote rapid economic growth.

Ejigayehu (2013) also analysed the effect of external debt on the economic growth of eight selected heavily indebted African countries (Benin, Ethiopia, Mali, Madagascar, Mozambique, Senegal, Tanzania and Uganda) through the debt overhang and debt crowding out effect with ratio of external debt to gross national income as a proxy for debt overhang and debt service export ratio as a proxy for debt crowding out. Panel data covering the period 1991-2010 was used. The empirical investigation was carried out on a cross-sectional regression model with tests for stationarity using Augmented Dickey-Fuller tests, heteroscedasticity, and ordinary regression. The concluding result from the estimation showed that external debt affects economic growth through debt crowding out rather than debt overhang.

Safdari & Mehirizi (2014) researched the effect of external debt on economic growth in Iran for the period of 1974-2007, by detecting the balance and long term relation of five variables: GDP, Private investment, Public Investment, external debt, and Imports. They used the Vector autoregressive model (VAR) in their econometric analysis and the result of the research showed that external debt and imports had a negative effect on the gross domestic product, but variables of private and public investments had positive effects on economic growth.

In an attempt to ascertain the impact of external debt on economic growth of Nigeria, Nwannebuike (2016) adopted the Ex-post facto research design. Data were analysed using Ordinary Least Square method and diagnostic tests were performed using Augmented Dick Fuller Unit Root Test, Co-integration and Error Correction Model. The result of the study revealed that External Debt is positively related to GDP in the short run but a negative relationship in the long run. Also, a negative relationship was established between debt service stock and GDP while Exchange Rate had a positive relationship with GDP. The study recommended that the Debt Management authorities should warrant that loans are utilized for purposes for which they were acquired and borrowed also a limit for debts should be set for states and federal governments based on well-defined criteria.

From the foregone empirical studies, it is evident that the literature on external debt and economic growth is replete with its divergent results. Divergence observed in these results suggests differences in theoretical and methodological approaches employed and the different contexts studied. The kind of the relationship between external debt stock and economic growth in the Somali context is subject to empirical investigation, such inquiry is what this study is set to achieve and to find out if this study will corroborate any of the above outcomes.

3.0. Theoretical Framework and Research Methodology

3.1 Theoretical Framework

The constant need to borrow from foreign countries and institutions arises from the essential role of capital in the development journey of any nation. Sustainable economic growth necessitates a given level of savings and investment and in a case where it is not sufficient, it results in external borrowing. Thus, the role of capital in the production process is essential in understand the growth pattern of any economy. Therefore, synthesis the typical production function with the debt overhang hypothesis to explain the negative effect of external debts on economic growth as proposed by Chenery, & Stout (1966).

The starting point is the traditional production function which may be written as follows:

$$Y_t = f(K_t L_t) \quad (1)$$

Where *Y* is growth rate of real GDP, *K* is capital stock, *L* is labour, and *t* is time.

Aggregate capital (K) can be define as the combination of private and public capital. This is expressed as:

$$K_t = f(K_g, K_p) \quad (2)$$

Thus, the effectiveness of private capital declines as soon as the values of certain public capital projects increase, then public capital constitutes a substitute of private capital. However, the country has been struggling with civil wars and conflicts the amount of public capital obtained through the local revenue and taxes are not enough to finance public investments in the country, and it becomes necessary for the government to look for other measures to fill the gap and that is where the external debt comes in to balance the equation. Therefore, External Debt Stock (EDS) becomes a complement of public capital (Kgt), and it is through that channel were the government is empowered to do its main obligation of public investments by borrowing foreign capital to supplement the domestic revenue and hence improving the over-all economic growth of the country.

Substituting equation (2) into equation (1) gives an augmented production function expressed as:

$$Y_t = f(K_{gt}, K_{pt}, L_t) \quad (3)$$

But, as we discussed above external debt stock (EDS) is a complement of public capital (Kg_t), since it is one of the sources government can enhance public investment and growth.

Therefore, equation (3), when external debt is included can be re-written as:

$$Y_t = f(K_{gt}, K_{pt}, L_t, EDS_t) \quad (4)$$

However, as emphasized by Ayadi & Ayadi, (2015) and Elbadawi, (1996) there are other factors associated with economic growth such as education, fiscal and monetary policy, exchange rate inflation, foreign direct investment, population growth and among others. Therefore, in this study the following variables are included in the specified functional form of the model; inflation (INF) to determine the stability of the local currency, population growth (POPN), and foreign direct investment (FDI) to examine how accumulated foreign debts impact the investment decisions of genuine investors as a results of high tax obligations caused by the increased arrears. The functional form of the model can be re-stated as;

$$Y_t = f(K_{gt}, K_{pt}, L_t, EDSGDPR_t, POPN_t, FDIGDPR_t) \quad (5)$$

In what follows, we imitate Patillo, Poirson & Ricci (2002) and Baraki (2005) by fitting a quadratic term (EDS^2) to capture the debt overhang hypothesis. We employ economic growth and debt stock as our dependent and independent variables respectively, and we utilize the same control variables already identified above. Researchers have basically tested the debt overhang hypothesis by running a growth regression on the debt stock and selected control variables. The control variables have usually included foreign direct, inflation, exchange rate and population growth (See Iyoha (1997) & Iyoha (2000). Accordingly, we specify the following function with the quadratic term inclusive for estimation:

$$Y_t = f(K_{gt}, K_{pt}, L_t, EDSGDPR_t, POPN_t, FDIGDPR_t, EDS_t^2) \quad (6)$$

Where Y is Gross Domestic Product, Kgt & Kpt represents the initially disaggregated capital (K), L is total labor force, EDSGDPR is External Debt Stock expressed as ratio to Gross Domestic Product, FDIGDPR is Foreign Direct Investment expressed as ratio to Gross Domestic Product, POPN is the Rate of Population growth, INFis Inflation rate (captures macroeconomic stability), t is time, and EDS^2 is the quadratic term to explain the existence of debt overhang hypothesis.

3.2 Methodology

As suggested by Engle-Granger representation theorem that if two or more series are cointegrated then they will be efficiently represented by an error correction mechanism. The Error Correction Model is used in this study to capture the short and long-run impact of the budget deficit on money demand. The method involves developing a model from its generalized form (over parameterized) to a specific form (parsimonious) using the Hendry modelling approach. In addition, if the variables in equation (7) have stochastic trends and follow a common long term equilibrium association, then the variables are said to be cointegrated. Cointegration is a test for equilibrium between non-stationary variables integrated of the same order. The Johansen's cointegration procedure (1990) is adopted for this study because it involves the use of a well-established, likelihood ratio statistics. The cointegrating equation is specified as:

$$y_t = \alpha + A_t y_{t-1} + ... + A_\rho y_{t-\rho} + \varepsilon_t \quad (7)$$

Where y_t is k-dimensional vector of non-stationary variables, and ε_t is a vector of white noise residuals. By using the first difference operator Δ equation (8) can be rewritten as:

$$\Delta y_t = \Pi y_{t-1} + \sum_{i=1}^{\rho} T_i \Delta_{t-i} + \varepsilon_t \quad (8)$$

The rank of matrix Π determines the number of linear combinations of y_t that are stationary processes. If the rank of the matrix is *r*, Π can be factored as $\alpha\beta'$, where the elements of α are the adjustment parameters in the error-correction model, and β contains the cointegrating vectors. Johansen derives two test statistics for testing the cointegrating rank. The first is the maximum eigenvalue test while the second is the trace statistic.

If the variables in equation (7) turn out to be cointegrated, the error correction modelling approach is adopted to reveal the short and long run effect of budget deficit on money demand. Thus, the Error Correction Model (ECM) takes the form;

$$\Delta Y_1 = a_0 + \sum_{i=1}^{i} a_{1i} \Delta Y_{t-i} + \sum_{i-1}^{j} a_{2i} \Delta X_{it-i} + a_3 ect_{t-1} + u_t \ {}^{8} \quad (9)$$

Where the long run properties are derived from the proportionality between Y_t and Xit. The above specification relates the short run change in the dependent variable ΔY_i to the short run change in the explanatory variable. This is called the impact effect (a_{2i}) but ties the change to the long run impact through a feedback mechanism.

From equation (7), the estimable money demand error correction model is given as:

$$\Delta Y_t = a_0 + \sum_{i=1}^{j} \alpha_{1i} \Delta Y_{t-1} + \sum_{i=1}^{j} \alpha_{2i} \Delta K_{pt-1} + \sum_{i=1}^{j} \alpha_{3i} \Delta K_{gt-1} + \sum_{i=1}^{j} \alpha_{4i} \Delta EDS_{t-1}$$
$$+ \sum_{i=1}^{j} \alpha_{5i} \Delta EDS^2_{t-1} + \sum_{i=1}^{j} \alpha_{6i} \Delta POPN_{t-1} + \sum_{i=1}^{j} \alpha_{7i} \Delta INF_{t-1} + \sum_{i=1}^{j} \alpha_{8i} \Delta FDI_{t-1} + \alpha_9 ect_{t-1} + u_t \quad (10)$$

Where ect_{t-1} = the error correction term lagged for one period, α_9 = the coefficients for measuring speed of adjustment to equilibrium in equation (11).

Prior to cointegration and estimation of ECM, the series were tested for stationarity using the Augmented Dickey-Fuller (ADF) and Kwiatkowski- Phillips-Schmidt-Shin (KPSS) tests. The reason for this test is the fact that macroeconomic variables are desired when they are stationary and on the contrary, regression on the series yields spurious results.

3.3 Data Sources

Time series data of twenty-eight years (1990-2016) was used in the study. It was acquired from the World Bank (www.worldbank.org), UN-data (www.un.org/popin/data.html), World Development Indicators (http://data.worldbank.org.wdi), World Bank tables and United Nations Statistics Division common data base. The variables that were used are Gross Domestic Product (GDP), External Debt Stock (EDS), Population growth Rate (POPN), Inflation (INF) and Foreign Direct Investment (FDI).

4.0 Empirical Results

4.1 Unit Root Test

Empirically, the starting point in a time series analysis is to ascertain the time series properties of the variables in the model using the Augmented Dickey-Fuller (ADF) and Kwiatkowski-Phillips-Schmidt-Shin (KPSS) tests to determine the order of integration of the series. The results of the three-unit root tests (ADF and KPSS) adopted for this study are presented in Table 4.1. For the ADF test, the decision rule is that the null hypothesis of the unit root cannot be rejected at the 5% levels for all the variables while null hypothesis for the KPSS test is rejected at the 5% level. From the results, it is seen that all the variables are integrated of order one I(1) after first differencing for all the two unit root tests utilized. Consequently, the linear combination of the variables can be carried using the Johansen and Juselius (1990) cointegration approach.

Table 4.1: Unit Root Tests

	Levels		First difference	
Variable	ADF	KPSS	ADF	KPSS
EDS	-1.594	-1.986	-5.212*	-8.774*
GDP	-1.326	-1.615	-5.992*	-6.128*
FDI	-0.345	-1.516	-5.216*	-7.850*
POPN	-1.221	-2.013	-5.527*	-4.161*
INF	-1.268	-1.206	-8.524*	-9.914*
EDS^2	-1.890	-1.610	-5.378*	-9.511*

Note: (1) Constant and trend equation is considered for both the ADF and KPSS

(2) Indicates significance at 1% and 5% significance levels. For the ADF and KPSS Tests, the critical values were -3.315 and -2.723 at 1% and 5% significance levels respectively while for KPSS critical values were 0.758 and 0.467 at 1% and 5% significance levels, respectively.

Source: Authors' computation

4.2 Cointegration Test

Having known that all of our variables were non-stationary at levels but become stationary at first difference, it implies that they are qualified for Co-integration to determine the long run relationship. The Johansen & Juselius (1990) cointegration technique was adopted to establish the existence of a long run relationship among the variables in equation (7). In line with the Johansen approach, the optimal lag length of the Vector Autoregressive (VAR) model needs to be determined first using various information criteria. Thus, the results of the lag selection criteria are presented in Table 4.2. The findings revealed that all the five different information criteria namely: Akaike

Information Criterion (AIC), Schwarz Information Criterion (SIC), Hannan-Quinn Information Criterion (HQ), Final Prediction Error (FPE) and Sequential modified LR test statistic (LR) suggests 1 as the optimal lag length.

Table 4.2: VAR Lag Order Selection Criteria

Lag Length	LogL	LR	FPE	AIC	SC	HQ
0	-218.343	NA	2.510	17.948	18.239	18.029
1	-142.071	109.832*	0.109*	14.726*	16.773*	15.294*

Note: * indicates lag order selected by the criterion
LR: sequential modified LR test statistic
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

The results from the trace and maximum eigenvalue tests presented in Table 4.3 using one (1) as the maximum lag length reveal that there is a Co-integration among External Debt Stock, Gross Domestic Product, inflation, population growth rate and foreign direct investment. The table also revealed that the trace and Maximum eigenvalue tests indicate 5 cointegrating equation, implying a long run relationship among External Debt Stock, Gross Domestic Product, inflation, population growth rate and foreign direct investment.

Table4. 3: Test Results for Cointegration between Pairs of Variables

	Trace Test K=1				**Maximum Eigenvalues K=1**				
Equation	H_o	H_A	Trace Statistics	5% Critical Values	H_o	H_A	Max-Eigen Statistic	5% Critical Values	No of Cointegrating Equation
Equation (7)	R=0*	R=0	148.50	69.82	R=0*	R=0	57.47	33.88	5
	R≤1*	R=1	91.03	47.86	R≤1*	R=1	49.31	27.13	
	R≤2*	R=2	41.72	29.79	R≤2*	R=2	20.18	14.24	
	R≤3*	R=3	21.54	15.49	R≤3*	R=3	14.87	9.21	
	R≤4*	R=4	7.59	4.54	R≤4	R=4	6.67	3.84	
	R≤5	R=4	3.45	2.95	R≤4	R=4	2.60	1.83	

Source: **Author's computation**

4.3 Results of the ECM Estimation

After confirming that the variables are co-integrated, an Error Correction Model which is constructed by including in the model, the lagged terms of the variables and the Error Correction Term was generated. The over-parameterized model and the parsimonious model are presented in Table 4.4 and 4.5 respectively.

Table 4.4 Short run relationship Model (Over-Parameterized Model)
Dependent Variable: DGDP

Variable	Coefficient	t-Statistic	Prob
Constant	0.007	0.210	0.837
D(GDP(-1))	1.039	3.006	0.012
D(EDS)	-0.109	-1.845	0.092
D(EDS(-1))	0.017	0.276	0.788
D(FDI)	-0.027	-2.994	0.012

D(FDI(-1))	0.006	0.655	0.526
D(INF)	-0.033	-2.518	0.028
D(INF(-1))	-0.004	-0.231	0.821
D(POPN)	0.054	0.439	0.669
D(POPN(-1))	-0.255	-2.629	0.024
D(EDS2)	0.019	2.447	0.032
D(EDS2(-1))	-0.006	-0.685	0.507
ECT(-1)	-0.490	-4.014	0.002

R2	0.799256
Adj R2	0.580263
Durbin Watson	1.631443
F-statistic	3.649688
Prob (F-statistic)	0.020044

Note: variables were significant at the 10%, 5% and 1% levels

Table 4.4 reveals that approximately 79% of the variation in Gross Domestic Product is explained by the External Debt Stock, Foreign Direct Investment, Inflation Rate, and Population Growth. The probability of the F statistic (0.020044) is significant which implies that the model is well specified.

The results of the parsimonious ECM model presented in Table 4.5 revealed that change in a one-period lagged value of External Debt Stock (EDS) has a negative (-0.1106), and significant (0.0587) impact on economic growth in the short-term in Somalia. This implies that a one percent increase in External Debt Stock (EDS), leads to -0.110631 decrease in economic growth (GDP) in the short-term. The negative sign, as postulated by the theory, is to depress the level of investment. This implies that substantial portions and new borrowings are used to service the high debt service requirements instead of investing in productive projects. Large debt service obligations use up foreign exchange and capital as they are transferred to lenders to repay interest and principal funds. This result corroborates the findings of Pattillo et al. (2002), and Clements et al. (2003).

Cohen (1993) asserted that the adverse effect of debt on growth is caused not only through the impact of stock debt but also via the flow of service payments, which are likely to crowd out investment. However, the negative relationship between total external debt and growth in this study may be due to these funds not being utilized in product investments or spent or the lengthy civil wars and conflicts in the country; and this result also concurs with the findings of Fosu (1999) who used the augmented production function, finding a negative correlation between debt and economic growth, in Sub-Saharan Africa during 1980-1990.

On the other hand, changes in one-period lagged value of Foreign Direct Investment (FDI) has a negative and significant impact on economic growth reason being the persistent increase in EDS diminished the foreign investor's confidence to inject capital into the domestic economy which will lower the overall foreign capital in the economy and will in-turn decrease economic growth of the country, the security deterioration and the political instability of the country might also reduce the level of FDI at a level it cannot contribute the overall GDP. This result was in line with Mbanga and Sikod (2001) using data for Cameroon, found that there exists a crowding out effects on foreign direct investment. However, changes in a one-period lagged value of inflation rate have a negative and significant effect on economic growth. This indicates that fluctuations and instabilities in prices impact negatively on economic growth in Somalia. This result is similar to Many studies like Cohen (1993); Were (2001); and Azam et al. (2013), among others reported a negative and significant impact of inflation on economic growth.

The results also show that in a one-period lagged value of population growth have strong and significant at 1% level of significance with a negative sign. This indicates that the growth rate of the population decreases the growth of investment through discouraging domestic saving. That means the larger the population the smaller the share of income allocated to savings and hence investment. This is in line with Chowdury's (1994) findings. Population growth lowers the average human capital and the steady-state capital-labour ratio for a given investment and thereby lowers steady-state economic growth in the neoclassical growth framework. The empirical works by Mankiw et al. (1992) and Kelley and Schmidt (1995) and record a negative and statistically significant effect of population growth on economic growth.

The result of EDS^2 which was meant to capture the debt overhang effect does not offer a confirmation to support the debt overhang argument by Krugman (1988) and Sachs (1989) which was the most commonly used argument to establish a negative relationship, as mentioned in the literature review chapter two. These authors argued that debt overhang is the main reason to reduce investment and slow economic growth in developing countries. As stated in Table 4.8 before the external debt stock squared to economic growth shows evidence of a significant effect on growth (0.0122) and does not have the correct sign (negative). This concluded that debt overhang effect might not hold in Somalia. This result is in line with the findings of the study by Wijnbergen (1989) test the debt overhang hypothesis for Mexico and concludes that it does not exist. Cohen (1993) rejected the debt overhang theory, arguing instead, that the important debt problem is crowding out of investment caused by debt service payments in 81 developing countries over the period 1965-1987.

In addition, Wijnbergen (1989) test the debt overhang hypothesis for Mexico and conclude that it does not exist. Borensztein (1990), using data for the Philippines has suggested that the debt overhang effect is expected to be strong when considering private investment and private debt. This hypothesis could not be tested in this study due to the unavailability of the requisite data.

The results further reveal that the estimated lagged error correction term ECT (-1) is negative and significant at 5 percent level. This supports the co-integration test results presented in Table 4.6. The feedback coefficient is -0.283 suggesting a fairly low speed of adjustment to equilibrium after a shock. Approximately, 28 percent of the disequilibria from the previous year's shock in Gross Domestic Product converge or adjust back to the long run equilibrium in the current year.

Table 4.5 Parsimonious Model

Dependent Variable: DGDP

Included observations: 24 after adjustments

Variable	Coefficient	t-Statistic	Prob
Constant	0.028	1.004	0.331
D(GDP(-1))	0.805	3.015	0.008
D(EDS)	-0.111	-2.035	0.059
D(FDI)	-0.024	-3.606	0.002
D(INF)	-0.029	-3.051	0.008
D(POPN(-1))	-0.215	-3.002	0.008
D(EDS2)	0.021	2.826	0.012
ECT(-1)	-0.283	-2.801	0.016

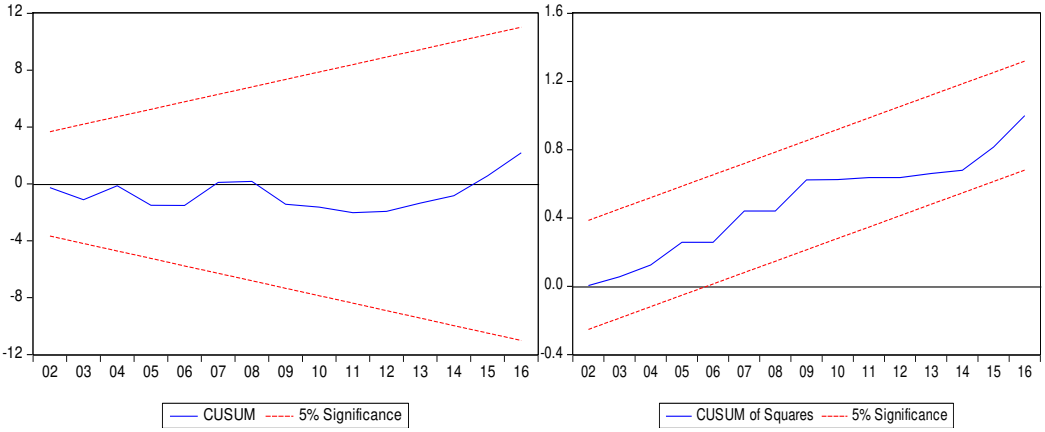
R2	0.707577
Adj R2	0.579642
Durbin Watson	1.850765
F-statistic	5.530753
Prob (F-statistic	0.002244

Note: variables were significant at the 10%, 5% and 1% levels

4.4 CUSUM & CUSUM Square Parameter Stability Test

CUSUM & CUSUM square parameter stability test is used to detect the instability of the variables and the coefficients. This test is most commonly employed in time series data after the Error Correction Model is conducted, to reveal the existence of any structural breakpoint.

Figure 4.1: CUSUM and CUSUM Square Parameter Stability Tests



The CUSUM &CUSUM square figure above indicate that the parameters estimated are stable during the sample period (1990-2016) and can best explain the variation in the dependent variable (GDP).

5. Concluding Remark

The aim of this study was to investigate the long-run relationship between external debt stock and economic growth in Somalia for a period of 1990 to 2016. The dual-gap analysis rationalizes the necessity for external borrowing as an attempt in trying to fill the savings-investment gap in an economy. That was why the study empirically examined the relationship between external debt stocks on economic growth in Somalia (1990-2016). The study employed co-integration model to examine long-term relationship between the variables, which has its advantage of application to level series. The results of the co-integration model confirm the presence of a long-term relationship between external debt stock and economic growth in Somalia. The study also examined the short-run relationship on the variables under study using the Error Correction Model of external debt stock and economic growth variables. The results of ECM showed that there is a negative and significant short-term relationship between external debt stock and economic growth in Somalia 1990-2016.

The study, therefore, concludes that growth in external debt stock has a negative impact on economic growth. Hence, the study recommends that the debt management authorities need to formulate proactive policies to control unsustainable growth in external debt as it discourages economic growth and foreign direct investments in Somalia.

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