Journal of Finance and Accounting

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ISSN: 2616-4965

Stratford Peer Reviewed Journals and Book Publishing
Journal of Finance and Accounting
Volume 8||Issue 2||Page 42-52 ||January||2024|
Email: info@stratfordjournals.org ISSN: 2616-4965

Economic Growth, External Debt and Corruption Nexus in Sub-Saharan African Countries: Moderation Modeling

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***How to cite this article*: Mokaya G. N, Nyamute W. I., Okiro K. & Barasa L. m. (2024). Economic Growth, External Debt and Corruption Nexus in Sub-Saharan African Countries: Moderation Modeling. *Journal of Finance and Accounting. Vol* 8(2) pp. 42-52** https://doi.org/10.53819/81018102t2337

Abstract

This study aligns with Sustainable Development Goal 8, which borders on "*economic growth by ensuring external debt is invested well in development projects that can spur economic growth"*. It contributes to the economic growth literature by evaluating the role of external debt and corruption on economic growth. The Sub-Saharan African region has witnessed an increase in external debt. However, the economic growth has been reducing. The region witnessed a contraction in economic growth to 2.7 percent in 2022 down from 4.4 percent of 2021. The literature indicates that corruption can impede external debt from achieving the intended purposes. Many studies have revealed the role of external debt in economic growth but have not studied the moderating effect of corruption thus creating a gap for this study. To achieve the objective, the study uses the Fixed Effects Panel data approach on unbalanced panel data on 46 sub-Saharan African countries from 1998 to 2021 to interrogate the nexus. The results revealed a positive relationship between external debt and economic growth. However, corruption was found to reduce the effectiveness of external debt in realizing economic growth. The study therefore recommends that governments of the countries in the region need to address corruption so to achieve the desired economic growth. They should implement measures focusing on improving institutions quality to control financial corruption. In addition, the policy makers should relook at increasing anti-corruption initiatives aimed at reducing poor governance for instance financing anti-corruption agencies to ensure corruption is reduced.

Key Words: *Economic growth, External Debt, Corruption*

Stratford Peer Reviewed Journals and Book Publishing
Journal of Finance and Accounting
Volume 8||Issue 2||Page 42-52 ||January||2024|
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1.0 Introduction

External debt has been building up for the last half century thus affecting both developing countries and the emerging markets. In 2022, global debt decreased by 10 percentage points of the world Gross Domestic Product (GDP) and reached 238 percent of world GDP. In U.S. dollars, the global debt was at USD 235 trillion in 2022 (IMF, 2023). In period beginning 2000, the Sub-Saharan Africa region embraced development initiatives that led to a sharp increase in external public debt. This has put a significant pressure on the region's macroeconomic policy framework. According to IMF (2021), the share of debt in GDP of many Sub-Saharan African countries crossed the debt sustainability threshold in 2021.

The median public debt in Africa is estimated to have declined to 65 percent of GDP in 2022 from 68 percent in 2021 thanks to debt relief initiatives that help countries withstand the confluence of global shocks including the COVID-19 pandemic. This ratio remains higher than the pre-pandemic level of 61 percent of GDP, and it is expected to increase further to 66 percent in 2023 and then to stabilize at around 65 percent in 2024. The expected increase in debt reflects growing financing needs—associated with rising food and energy import bills, high debt service costs due to interest rate hikes, exchange rate depreciations, and rollover risks. The Sub-Saharan Africa faces several downside risks to its growth prospects that call for cautious optimism. The tightening of global financial conditions and appreciation of the United States dollar have exacerbated debt service costs and could increase the risk of debt distress, especially for countries with severely constrained fiscal positions. External debt interest payments as a proportion of the government revenues have risen above the pre-pandemic level in many countries (Dafe, Kaltenbrunner, Kvangraven, Weigandi, 2023)

The median interest payments on external debt for the countries as a percent of government revenue rose from 2.2 percent over between 2015 and 2019 to 2.7 percent over the period of 2020 and 2022. This increase shows that government revenues have not increased in proportion to the rising interest payments. The increase in the interest rate payments also highlights the erosion in countries fiscal space thus constraining the governments' capacity to finance domestic recurrent spending and public investment. For all the countries, interest costs were higher during 2020 and 2022 period than during 2015to 2019 period except in Mauritania, Zambia, Democratic Republic of Congo and Chad. For Zambia, the decrease in interest payment to tax revenue ratio was as a result of missed interest payments or defaults during the COVID-19 pandemic. The rise in the interest costs has been compounded by increasing United States dollar denominated principal payments, leading to overall high external debt service payments. The total external debt service payments as a percentage of government revenues increased between 2015-2019 period and 2020–2022 period in many countries. The median external debt service to revenue ratio of the countries was about 6.8 percent in 2015–2019, well below the IMF and World Bank debt sustainability threshold of 18 percent. The ratio increased to about 10.9 percent in 2020–2022, still below the threshold. Even in the four countries in the region where interest payments declined, Chad, Mauritania, Democratic Republic of Congo and Zambia experienced a higher total debt service during the period as compared to the pre-pandemic period. This showed that principal payments were the major component of debt service during 2020–2022 periods among the countries in the region (African Development Bank, 2023).

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The number of SSA countries at high risk of debt distress has sharply increased from eight countries in 2013 to 18 countries in 2018 (IMF, 2018). The average inflation rate in the region from 2016 to 2020 was about 10.62 percent (*Sub-Saharan Africa report, 2022*). Regional inflation increases was associated with higher price pressures in Ghana, Nigeria, South Africa and Tanzania. Currency depreciation also remained an upside risk (creator, 2015). On corruption, the average SSA CPI score is 33 out of 100 showing no improvement on the 2021 corruption perception index. 44 out of the 48 countries assessed on the index score below 50 and corruption in the region continues to plunder natural resources and impedes access to public services (Trasparency International, 2021).

To reach a specific development rate, developing nations must invest. However, because there are not enough domestic savings, many nations are struggling with a lack of capital accumulation. Because of this, borrowing from outside is the way forward for many developing nations to increase their investments. Foreign borrowing is a significant source of revenue that both developed and developing nations use. There is a significant issue with emerging countries' growing external debt stock and consequently rising external debt obligations. In order to maintain macroeconomic stability, measures to reduce debt and the sustainability of external obligations are also crucial. Increasing government revenue to cover future debt service with borrowed funds can enable the sustainability of external borrowing. In the event that borrowed funds are not utilized properly and efficiently, it may become necessary to pay off the external debt with a rising amount of external debt. High levels of principal and interest on external debt have a detrimental effect on

the economies of the nations and can potentially lead to a debt crisis (Nutassey, Nomlala, & Sibanda, 2023).

For most developing countries, external debt has been a vital source of funding, majorly as a backup to countries tax revenue streams in times of economic expansion. In addition, external debt has become essential in the developing countries due to their low levels of domestic savings. It is believed external debt is the most is the best alternative when a country would like to invest in infrastructural projects and yet the tax revenue is inadequate. Many countries prefer external debt as a source of funding as opposed to printing money that can put economies in jeopardy (Olaoye, 2023)

In sub-Saharan Africa, growth is projected to be 4.0 percent in 2024 remaining below the historical average of 4.8 percent. This projected reduction in growth reflects in a number of cases for example worsening climatic conditions, the global slowdown and domestic supply issues linked to poor electricity supply. Growth in Nigeria is projected to decline from 3.3 percent in 2022 to 3.1 percent in 2024. The contraction can be attributed to weaker oil and gas production than expected, partially as a result of maintenance work (IMF, 223)

The increased external debt in the region was created by debt appetite among the region's governments to borrow to invest in development initiatives such as roads, ports, railways, sewer systems, urban lighting and developments that are linked to modern economic growth. External debt stand out as the main source financing development projects in the region since many countries of the region are facing macroeconomic structural rigidities making it difficult for them to have adequate revenue to finance the development priorities. In addition, the countries in the region have continued to low share of tax revenue in GDP. Further, the countries in the region have exports that cannot yield them adequate foreign currency to finance their development projects. This has prompted the countries to turn to external debt on multilateral and bilateral arrangements to fund their development priorities. Despite the increase in external debt in the region, economic growth has remained low (Bunde, 2023). According to ADB (2023), the growth in real gross domestic product (GDP) estimated at 2.7 percent in 2022, down from 4.4 percent in 2021. The real GDP growth in 2022 is below the global average of 3.4 percent. The dismal economic growth despite increase in external debt might be due to failure to control corruption that might be diverting it to unintended uses consequentially, leading to a gap in this regard. The focus of the extant literature has been on the effect of external debt on economic growth without much emphasis on the moderating effect of corruption and external debt on economic growth in the Sub-Saharan Africa. As expected, if the regional governments borrow external debt for development initiatives and in addition permit an enabling environment through controlling corruption, it is rational to find an increase in economic growth, ceteris paribus.

Figure 1 shows the scatterplot evidencing this intrinsic relationship. We find that economic growth proxied by the natural logarithm of GDP per capita reveal a positive association with natural logarithm of external debt.

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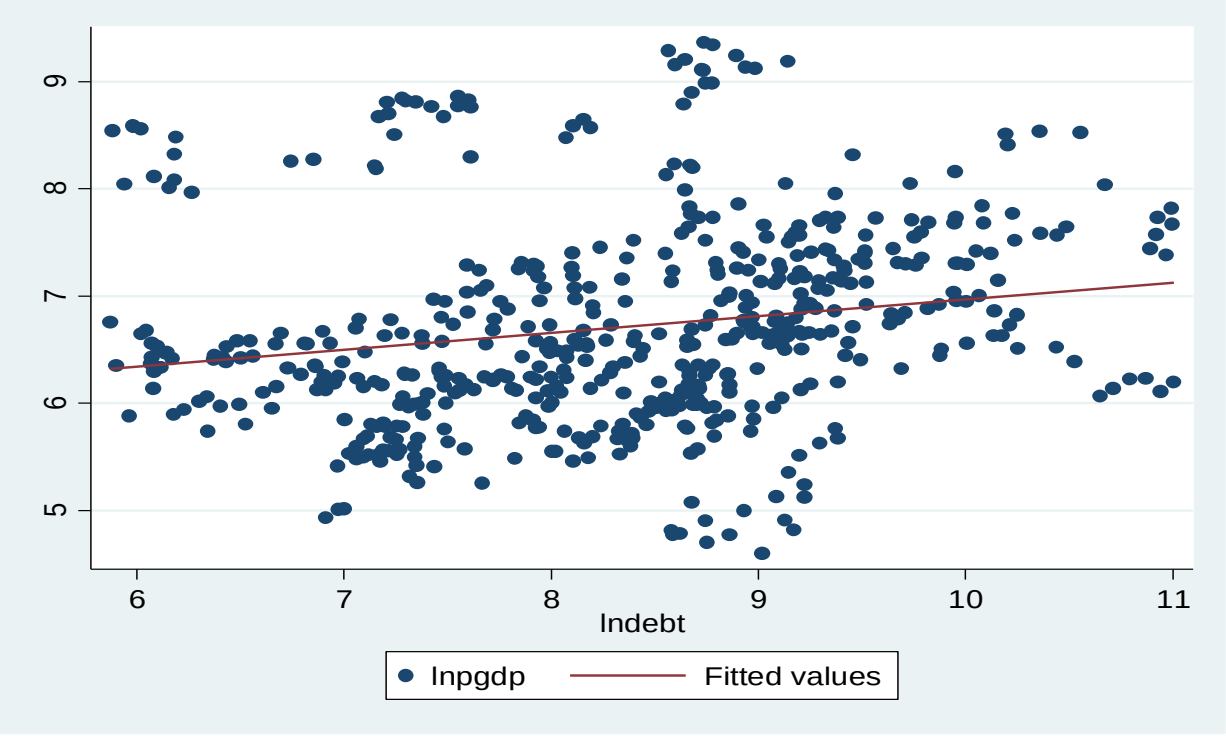

Figure 1: scatterplot showing the relationships between Economic Growth and External Debt

The examination of the "external debt", "corruption" and "economic growth" hypotheses is motivated by the relatively poor economic performance of Sub-Saharan Africa and the apparent gap in the extant literature. Extending the work of Omoruyi and Meibi (2016), this study's objectives are to: (i) determine the effect of external debt on economic gowth in the Sub-Saharan Africa; (ii) assess if corruption distorts the effect of external debt on Economic growth. Fixed effects estimation techniques are used to methodically probe these questions with an unbalanced panel data of three variables on 46 selected Sub-Saharan African countries. The rest of the study is structured as follows: Literature review section discusses the empirical literature; Methodology section outlines the data and model; Results and discussion section interprets the results and Conclusion and policy implications section concludes with policy recommendations.

2.0 Literature Review

External debt, whether in Sub-Saharan Africa or elsewhere, majorly aims to provide additional funding to meet infrastructural and growth needs. Therefore, various studies have been carried out for the period beginning 2000 to assess the role of external debt on economic growth. However, the findings of these studies have been mixed and conflicting. In addition, the nexus between external debt and economic growth is well established in the literature for both developing and developed countries.

For example, Mencinger, Aristovnik & Verbic (2015) studied the role of public debt in economic growth among the developed countries covering the period between 1980 and 2010. The study used panel data estimation technique. The results suggested that public debt up to a certain level had a positive effect on economic growth but beyond it had a negative effect. In another study, Esteve, and Tamarit(2018) investigated the effect of external debt on economic growth in Spain

using time series data running from 1851 to 2013. The study used dynamic ordinary least squares (DOLS) method. The study results showed that external debt had a negative impact on the Spanish economic growth. Another study carried out in developed countries is that of Ogawa, Sterken, and Tokutsu (2016). The authors investigated the role of external debt on economic growth among 31 European Union member countries for the period between 1995 and 2013. On using Panel Vector Autoregressive (VAR) model, it was revealed that external debt had a negative effect on the countries' economic growth. Al-Refai (2015) studied the effect of external debt on economic growth among OECD nations for the period between 1981 and 1995. On using Ordinary Least Square, the study found a positive relationship between external debt and economic growth. Lof, and Malinen, (2014) studied the effect of external debt among 20 developed nations for two periods 1954 to 2008 and 1905 to 2008. On using panel VAR, it was revealed that external debt had a negative effect on economic growth of the countries.

In developing countries, Mohsin, Ullah, Iqbal, Iqbal & Taghizadeh-Hesary (2021) studied external debt and economic growth in the South Asian region for the period between 2000 and 2018. The study used fixed effect model. The results showed that external debt had a negative impact on economic growth. Edo, Osadolor & Dading (2020) investigated the impact of external debt on economic growth among eight Sub-Saharan African countries. The study used 416 quarterly observations quarterly data running from first quarter of 2005 to fourth quarter of 2017. On using ARDL panel model the results revealed insignificant positive impact of external debt on economic growth in the short run. However, the impact was negative in the long run. In another study, Senadza, Bernardin and Fiagbe, Korsi (2017) examined the effect of external debt on economic growth in Sub-Saharan Africa. The paper used annual data for 39 Sub-Saharan Africa countries from 1990 to 2013. The study employed System Generalized Methods of Moments (GMM) estimation technique. The study found that external debt negatively affects economic growth in Sub-Saharan Africa. In addition, Owusu-Nantwi and Erickson (2016) studied the effect of external debt on economic growth in Ghana using time series data running from 1970 to 2012. On using Vector Error Correction Model, the study established a positive relationship between external debt and economic growth. In addition, Uzun, Kabandayi and Emsen (2012) studied the effect of external debt on economic growth among 19 transitional economies using ARDL bounds testing model. The results revealed that external debt had a positive effect on economic growth of the countries.

In a related study, Senadza, Fiagbe and Quartey (2017) investigated the effect of external debt on economic growth among 39 Sub-Saharan countries using panel data running from 1990 to 2013. The study used generalized method of moments estimation technique. The results revealed that external debt had a negative effect on the countries' economic growth. Karadam (2018) carried out a cross country study to estimate a nonlinear relationship between the external debt and economic growth using panel data sourced from 111 developing countries. The study used panel smooth transition regression (PSTR) estimation technique. The study found a positive relationship between external debt and economic growth in short run. However, a study found a negative relationship between external debt and economic growth as the debt increases. Earlier, Presbitero (2012) had revealed that external debt would promote economic growth in developing countries as long as the indebtedness threshold does not exceed 90 percent of GDP.

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3.0 Methodology

Estimation techniques

The study used Fixed Effects method, which serves as robustness checks in accounting for heterogeneities across the panel. The technique is suitable in the event of cross-sectional dependence in the data and has been used in various panel data studies (Mohsin et al.2021).

Variables and expectations

The study used three variables on 46 Sub-Saharan countries from 1998 to 2021 to probe the study question and achieve the objective. Nigeria and South Africa were eliminated from the study because they are two largest economies from the Sub-Saharan Africa region. Western Sahara and Reunion were not included due to lack of data on all the variables considered in the study. There is one dependent variable representing the economic performance: GDP per capita (GDPPC). The main explanatory variable is external debt (EXTDEBT), the moderating variable is corruption perception index (CPI) as measure of corruption. All the variables were sourced from World Development Indicators (WDI).

On a priori expectations, we expect a positive relationship between external debt and economic growth such that higher external debt may be expected to lead to economic growth through establishment and improvement of infrastructure (Bunde, 2023). The study expected same direction of relationship (negative) between corruption and economic growth.

Model

To achieve the study objective, GDP per capita was expressed as a function of external debt, corruption and interaction term of external debt and corruption, (ln*EXTDEBTit*∗ CPI*it*), That is:

$$lnGDPPC = \beta_0 + \beta_1 EXTDEBT_{it} + \beta_2 CPI_{it} + \beta_3 \ln(EXTDEBTit * \text{CPI}it) + \delta_i + V_{it}$$

Where, ln is natural logarithm; δ_i represents the fixed effects for every Sub-Saharan country considered in the study; β_0, β_1, β_2 and β_3 are parameters to be estimated and *v* is an idiosyncratic error term that is assumed to be a white noise. To control for outliers, establish an elasticity relationship and reduce "noise" in the data the GDP per capita and external debt that take larger values are transformed into their natural logarithms. The sign of the coefficient of the interaction term, β_3 evaluates if the interaction of EXTDEBT and *CPI* improves or distorts the impact of external debt on economic growth.

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4.0 Results and Discussion

Pre-estimation results

Table 1 contains the descriptive statistics. Furthermore, it displays the correlation coefficients between the target variables EXTDEBT and CPI.

Table 1: Summary of Descriptive Statistics

Summary Statistics						**Pairwise Correlation**
Variable	**Observation**	**Mean**	**Standard Deviation**	**Minimum**	**Maximum**	External debt
GDP per capita	1,102	516.26	309.69	99.76	11645.98	-
External debt	1,032	5088.72	7904.174	354.92	60093.75	1.0000
CPI	864	2.53	0.97	1.5	6.5	-0.1273***

Notes: *** p<0.01, ** p<0.05, * p<0.1,

The results showed that external debt has increased from USD 354.92 million to USD 60093.75 million during the study period. The mean of the debt during the study period stood at USD 7618.10 million. The external debt had the highest standard deviation of USD 9742.74 million, an indication that the region has had high variability in debt. This finding is in agreement with the literature that shows that external debt has been on the rise in the region (World Bank, 2019). The corruption variable CPI runs from 1.0 to 10. The higher the score the less corrupt, the country is and the lower the score the more corrupt the country is. The mean is 2.53 and the standard deviation is 0.97. It seems that the variation is adequate. The closer the coefficient of correlation is to − 1 or 1, the stronger the association. The pairwise correlation between external debt and CPI is less than 0.5, thus suggesting absence multicollinearity among the regressors.

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Empirical Results

Table 2 contains the empirical results.

Table 2: The moderating Effect of Corruption on the Relationship between External Debt and Economic Growth in SSA Regression Result

Fixed-effects (within) regression		Number of observations = 864		
Group variable: country		Number of groups = 36		
R-squared:		Observation per group:		
within = 0.2750		minimum = 24		
between = 0.4259		average =24.0		
overall = 0.3838		maximum =24		
		Wald chi2(6) = 93.19		
corr(u_i, X) = 0 (assumed)		Prob > F =0.0000		
(Standard Error adjusted for 36 clusters in country)				
Dependent Variable : Natural Logarithm of GDP Per Capita				
	Coefficient	**Robust Standard Error**	**t**	**P>t**
Ln of External Debt	0.21	0.146	1.43	0.154
CPI	-0.23	0.388	0.66	0.545
Ln of External Debt*CPI	-0.026	0.040	0.64	0.520
Constant	3.66	1.37	2.66	0.008
sigma_u	0.636			
sigma_e	0.410			
Rho	0.706 (fraction of variance due tou_i)			

From the results in Table 2, it was revealed that the multiple regression model produced an Adjusted R^2 = 0.3838, Probability of F = 0.0000. The Adjusted R^2 implied that external debt, corruption and their interaction term explain 38.38 percent of the variation in economic growth of the SSA member countries. The probability of F statistic implied that the slope coefficients are statistically different from zero. In other words, the external debt, corruption and their interaction term are jointly important in influencing the economic growth among the SSA member countries.

Further, the results in Table 2 revealed a positive relationship between external debt and GDP per capita. Specifically, the results revealed that an increase in external debt by one percent leads to an increase in GDP per capita by 0.21 percent ceteris paribus. These results conform to endogenous growth theory since external debt can be used to establish and improve the infrastructure. This may lead to increase in capital, a key input of the endogenous growth theory thus leading to increase in output. The results are in agreement with earlier studies by Owusu-Nantwi and Erickson (2016), Al-Refai (2015) and Uzun, Kabandayi and Emsen (2012). However, the results depart from those by Ogawa, Sterken, and Tokutsu (2016) and Mohsin et al. (2021). The coefficient of the interaction term between external debt and corruption was negative. This implies that corruption reduces the effectiveness of external debt on realizing economic growth in Sub-Saharan Africa region.

Conclusion and policy implications

The study concludes that external debt and corruption are significant in driving economic growth in Sub-Saharan Africa. The results support the existence of positive relationship between external debt and the economic growth. Therefore, the results reveal the sustainable external debt can achieve better economic performance for countries in the Sub-Saharan Africa region. The results of the interactive effect of external debt and corruption showed that corruption reduces the effectiveness of external debt in realizing better economic performance in the region. This finding confirms the negative effects corruption and poor governance has towards economic growth of SSA region. For instance, corruption related to embezzlement of funds may divert borrowed funds from intended purposes. In addition, corruption is likely to lead to odious debt.

Since corruption in the Sub-Saharan Africa countries is diminishing the economic benefits of the external debt, the study recommends that the governments of the countries in the region needs to address corruption so to achieve the desired economic growth. The countries should implement measures focusing on improving institutions quality to control financial corruption, providing a favorable environment for fruitful investments, and implementing sound economic policies that encourage high GDP Growth. In addition, the policy makers should relook at increasing anti-corruption initiatives aimed at reducing poor governance such as financing anti-corruption agencies to ensure corruption is lessened.

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