Regression Analysis of the Effects of Debt on Economic Performance in Kenya

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ABSTRACT

This study investigates the impact of debt on economic performance in Kenya, focusing on both internal and external debt. Using regression analysis and correlation techniques, data from 2000 to 2021 was analyzed to understand the relationship between debt levels and economic growth indicators such as GDP. The findings reveal a nuanced relationship: while internal debt shows a positive association with economic growth, external debt demonstrates a negative association. Effective debt management strategies are crucial to mitigate adverse effects, including monitoring debt levels, negotiating favorable terms with creditors, and directing borrowing towards productive sectors. Promoting export-led growth, enhancing fiscal discipline, and continuous monitoring and evaluation are recommended policy actions. Despite limitations such as data constraints and external factors influencing economic performance, future research avenues include long-term analysis, sectoral studies, comparative analyses, and qualitative investigations into stakeholder perceptions. This study contributes to understanding the complexities of debt dynamics and informs policymakers in navigating sustainable economic development pathways.
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1   Introduction

Economic performance refers to the overall productivity and growth of an economy. It measures the ability of a country or region to effectively utilize resources to generate wealth, employment opportunities and improve the standards of living for its citizens.Various indicators are used to assess economic performance including gross domestic product(GDP), inflation rates, unemployment rates, income levels ,trade balance and productivity.In the study we shall focus on GDP as one of the indicators. GDP is the standard measure of the value added created through the production of goods and services in a country during a certain period. GDP=Consumption+Investment+Government spending+Net exports

Debt is a sum of money that is owed or due. External debt is the portion of a country's debt that is borrowed from foreign lenders, including commercial banks, governments, or international financial institutions.If a country cannot repay its external debt, it is said to be in sovereign debt and faces a debt crisis.Internal debt refers to the portion of a country's debt incurred within its borders. Kenya being a developing country and unable to finance their budget deficits, making it borrow from external sources such as International Monetary Fund (IMF), World Bank and bilateral sources such as other countries or foreign governments and international capital markets by issuing bonds and internal sources such as Central Bank of Kenya (CBK)and commercial bank advances. These borrowings are often used to fund infrastructure projects, development initiatives or to address budgetary gaps. Kenya, like many other developing nations, has experienced a substantial increase in debt over the past decade. This surge in borrowing has been primarily driven by the need to finance ambitious infrastructure projects, address budgetary gaps, and stimulate economic development. While external debt can be a crucial source of capital for investment, concerns have been raised about its potential impact on the overall economic growth and stability of the country.

The composition of Kenya's external debt includes loans from bilateral and multilateral institutions, as well as commercial sources. The terms of these loans, including interest rates and repayment periods, vary and can significantly influence the country's fiscal health. Additionally, the efficiency of utilizing borrowed funds for productive investments and the management of debt sustainability are critical factors that shape the relationship between debt and economic growth.

The project conducted a comprehensive study analyzing and understanding the relationship between external debt, internal debt and economic performance of kenya using regression model. This research is crucial as kenya,like many developing countries,relays significantly on borrowing to finance various development projects and address budget deficits.

Understanding the impact of debt on economic indicators is essential for policy makers and stakeholders in making informed decisions about sustainable economic development.

2   Literature Review

Okoye (2013) argues that external debt can be a driver of economic growth and development if debtor nations can prudently manage the proceeds of the loan in a manner that guarantees returns over

and above the costs associated with the loan. Regrettably, countries with high incidence of external debt burden are those saddled with massive corruption, weak institutions and poor project planning and implementation.External debt acquisition therefore throws up management challenges for debtor countries. If it accumulates so much as to increase government instability or the country risk, it may lead to capital flight because foreign investors may decide to move their investments to more economically stable environments.Also, poor external debt management creates a burden on the borrowing nation and this could be a disincentive to domestic enterprise since a disproportionate fraction of national earnings would be channeled to debt service payments thereby stifling economic growth. Proper and effective management of external debt should, among other things, accord due consideration to source and tenure of the loan as well as feasibility and viability of projects to be financed.

Putunoi and Mutuku (2013) showed that markets for domestic debt are playing a progressively vital part in promoting economic growth, and found out long-term expansion of domestic debt to have a beneficial paraphernalia on growth of economies. In keeping up with Sheikh et. al (2010), whose study of a developing economy, Pakistan using the OLS technique was conducted from 1972-2009, established positive relation of domestic debt and growth of an economy. In addition, domestic borrowing has been used in part to fund government spending that contributes to GDP growth and specifying that domestically borrowed funds ought to be used for tenacities of long-term growth and development.

Elbadawi et al (1996) studied the effect of debt overhang on economic growth using data for 99 developing Countries, spanning sub-Saharan Africa, Middle East, Latin America and Asia. They find evidence of a negative effect of external debt on economic growth. Specifically, they find that external debt affects growth directly through current debt inflow in relation to GDP; accumulated debt (effect of debt overhang) outflows in respect of debt service and directly through the effects of debts on public sector expenditures

Maana et al. (2008) explores the impact of domestic debt on Kenya's economy covering the period 1996 to 2007 using a modified Barro Growth Regression model. The study established that domestic debt expansion had a positive but not significant effect on economic growth during the period. However, the study found no evidence that the growth in domestic debt crowds-out private sector lending in Kenya

Gideon K Mukui (2011) used a linear model to analyze the effect of external debt on economic growth in Capital formation, a key factor of production has positive effect on economic growth. Foreign direct investment positively affects economic growth signaling that substantial inflow of foreign capital can speed up the growth process. Labor force indicated the negative to increase the level of output in the country. Similarly domestic savings and inflation showed Kenya over the period 1980 to 2011, considering GDP as a function of external debt among other factors. The empirical results revealed that external debt exerts a negative impact on economic growth implying that more unskilled labor with low productivity is unlikely economic growth; clearly indicating that higher external debt discourages economic growth.

Abbas and Christensen (2007) analysed optimal domestic debt levels in low-income countries and emerging markets between the period 1975-2004 using Granger Causality Regression model and found that moderate levels of marketable domestic debt as a percentage of GDP have significant positive

effects on economic growth. The study also provided evidence that debt levels exceeding 35 % of total bank deposits have negative impact on economic growth. Adoufu and Abula (2010) examine the effect of external debt on the Nigerian economy during the period 1986-2005 using OLS technique. The findings reveal that domestic debt has negatively affected the growth of the economy and recommends that the government should introduce efforts to resolve the outstanding domestic debt.

Lending the government by local banking institutions reduces available credit for private sector. (Swianiewicz, 2004). Crowding out thus brings about a reduction in individual consumption since it increases the level of government expenditure causing a decline in individual spending pattern. According to classicists, public debt necessitates a shift of resources from private sectors to the government via additional tax levies. This theory is significant to the study as it helps us respond to this first study inquiry; What is the impact of domestic debt on Kenya's economic growth

Sulaiman and Azeez (2012) examined the effect of external debt on economic growth in Nigeria using the ordinary least square (OLS) estimation technique. They document evidence of positive relationship between external debt and economic growth.

David Ricardo's views are not entirely different from those of Adam Smith. He argues that debt among other factors can cause a disturbance to an otherwise flourishing economy that is at equilibrium. Debt is considered an 'evil' that interferes with businesses and the economy as a whole. Unlike Adam Smith who argues that an economy should take debts in the event of war, Ricardo thinks that people should be taxed highly to settle the burden that comes with war rather than resorting to debts. Another undesirable effect of public debt is that it leads to capital flight as it causes the movement of many capitalists from their native homes to invest and live abroad for fear of future high taxes which will cripple their businesses. He mostly argues for taxation as a means of raising revenue in place of debts (Churchman, 2001).

3 Research Methods

3.1 Research Design

In this research we employed correlational research design to determine the extent of a relationship between external debt, internal debt and economic performance. Correlational research design was used to determine and reflect the strength and direction of the relationship between variables.

3.2 Data

We used secondary data from 2000-2021, which was obtained from various sources such as data from World bank CBK. To aid in the analysis of data SPSS software version 25 was used. The analysis was conducted at 95% confidence interval. Furthermore, to study the relationship between debt and growth of the kenya's economy, we conducted multivariate regression analysis to establish the effect of debt borrowed and changes in annual gross domestic product, that is used as an indicator of economic growth.

3.3 Analytic Model

As depicted above, the analysis was modelled based on regression model. Regression model is a statistical model that estimates the relationship between one dependent variable and one or more independent variables using a line. To analyze their relationship we used Regression model where both external and internal debt were independent variables whereas economic growth which is measured by Gross Domestic Product (GDP) as the dependent variable.

$$y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \epsilon \tag{3.1}$$

Where :
y=GDP

x_1=External debt

x_2=Internal debt

Since the data might not be harmonious, the study will reconcile and try to use most correct and consistent data for the analysis.

4 Results and Analysis

4.1 Descriptive Statistics

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Real GDP prices (Ksh. Million)	22	982855	9395942	4793611.68	3250459.306
Internal Debt	22	1586191.52	45245253.62	13673565.0900	12961190.95078
External Debt	22	3188942.94	47501080.65	14418813.7527	13526352.22396
Valid N (listwise)	22				

Figure 1: Descriptive Statistics

This section presents Descriptive Statistics on the Economic Growth rate in Kenya. Furthermore it shows data on Internal and External Debt as they are variables to the economic growth model.

4.2 Economic Growth

The study sought to ascertain the Economic Growth rate of the country within the study period (from 2000 to 2021) articulated as the prices of the GDP. The GDP prices was plotted against the years using the preceding year as the base year. The trend of GDP is illustrated in figure 2.


Figure 2: Trend in Economic Growth

From figure 2 above it is evident that the economic growth of the country shows a increasing pattern at different times of the study period. At the beginning, the country recorded Ksh.982,855 economic growth, one of the low values.From the year 2000 up to the 2008 economic growth was slightly increasing. Between 2008 and 2009 the economic growth shows a drastic increase. After 2009, the economic growth is gradually increasing.

4.3   Internal Trends

Figure 3 portrays a steady increase in the internal debt of the country from beginning up to 2014. We
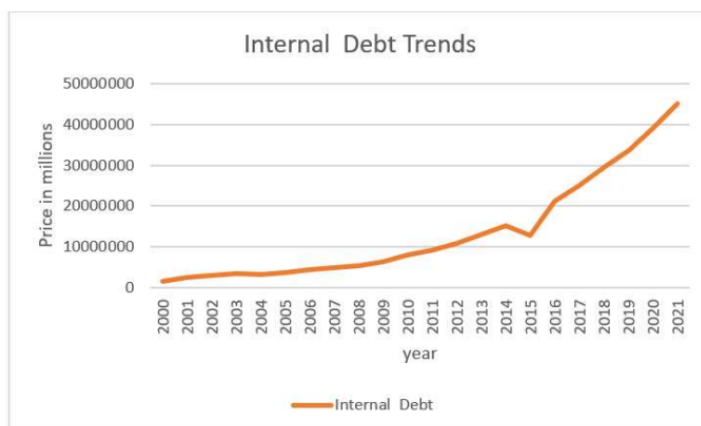
notice a slight decline between 2014 and 2015. There is a drastic increase between 2015 and 2016 thereafter the succeeding years show a gradual increase.
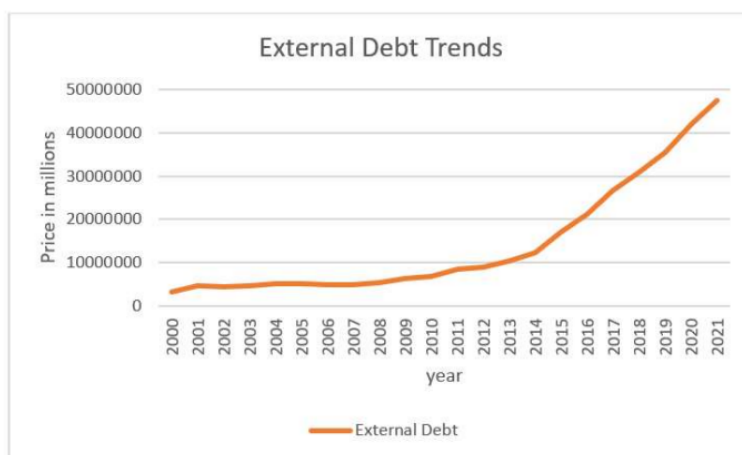
4.4 External Trends

External Debt Trends

Figure 4 portrays a slight increase in the external debt of the country from beginning up to 2013.From 2013 to the end of the study period shows a gradual increase in the external debt accumulated.

4.5 Inferential Statistics

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.886ª	.784	.762	1586788.883	.784	34.560	2	19	.000

a. Predictors: (Constant), External Debt, Internal Debt

From the regression model above the measure of goodness fit, R square is 0.784 and the adjusted R square is 0.762 implying that only 78.4 % of the variations in GDP growth rate is explained by the independent variables; External and Internal Debt.

5 Interpretation of the Findings

The regression model exhibits a high level of explanatory power, with an R-squared value of 0.784, indicating that approximately 78.4% of the variance in the outcome variable can be explained by the independent variables, internal and external debt. The adjusted R-squared value of 0.762 suggests that the model's goodness of fit remains robust even after adjusting for the number of predictors.

Internal Debt Coefficient (β_1= 0.720, p = 0.003). The coefficient for internal debt suggests that, holding all else constant, a one-unit increase in internal debt is associated with an increase of 0.720 units in the

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2018612.295	500737.182		4.031	.001
	Internal Debt	.720	.211	2.872	3.416	.003
	External Debt	-.491	.202	-2.042	-2.429	.025

a. Dependent Variable: Real GDP prices (Ksh Million)

outcome variable, that is Economic performance. This coefficient is statistically significant at the 0.05 level (p = 0.003), indicating a reliable relationship between internal debt and Economic performance.

External Debt Coefficient (β_2 = -0.491, p = 0.025). Conversely, the coefficient for external debt suggests that, holding all else constant, a one-unit increase in external debt is associated with a decrease of 0.491 units in the outcome variable. Similar to internal debt, this coefficient is statistically significant at the 0.05 level (p = 0.025), indicating a significant relationship between external debt and the Economic performance.

The F-test for overall model significance yields a highly significant result (F = 34.560, p-value= 0.001), indicating that the regression model as a whole is statistically significant in predicting the Economic performance. Additionally, the significant change in R-squared = 0.784, p-value= 0.001 further confirms the importance of both internal and external debt in explaining the variance in the Economic performance.

$$y = 2018612.295 + 0.720x_1 - 0.491x_2 \tag{5.1}$$

6   Conclusion

This research aimed to analyze the effects of debt on economic performance in Kenya, focusing on both internal and external debt. The study utilized regression analysis and correlation techniques to explore the relationship between debt levels and economic growth indicators such as GDP. Data from 2000 to 2021 was obtained and analyzed using SPSS software.

The findings revealed a complex relationship between debt and economic performance. Internal debt showed a positive association with economic growth, indicating that an increase in internal debt was linked to improved economic performance. Conversely, external debt exhibited a negative association with economic growth, suggesting that an increase in external debt was associated with decreased economic performance.

Based on the results of the analysis, it can be concluded that debt plays a significant role in shaping economic performance in Kenya. While internal debt appears to have a positive impact on economic

growth, external debt poses challenges and constraints on economic development. Therefore, it is crucial for policymakers to carefully manage debt levels to ensure sustainable economic growth and stability.

7   Recommendations

In light of the findings, several recommendations are proposed:

Debt Management: Policymakers should implement effective debt management strategies to mitigate the adverse effects of external debt on economic performance.This includes monitoring debt levels, negotiating favorable terms with creditors, and diversifying sources of financing.

Investment in Productive Sectors: Government borrowing should be directed towards productive sectors that have the potential to generate high returns on investment and contribute to long-term economic growth. This includes investments in infrastructure, education, healthcare, and technology.

Enhanced Fiscal Discipline: There is a need for enhanced fiscal discipline to ensure that borrowed funds are used efficiently and transparently. This includes strengthening budgetary oversight mechanisms, improving public financial management systems, and combating corruption.

Promotion of Export-Led Growth: To reduce reliance on external borrowing, efforts should be made to promote export-led growth and diversify the economy. This includes supporting industries with export potential, improving competitiveness, and facilitating trade agreements.

Continuous Monitoring and Evaluation: Regular monitoring and evaluation of debt levels and their impact on economic performance are essential. This will enable policymakers to make timely adjustments to fiscal policies and debt management strategies as needed.

8   Acknowledgment

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