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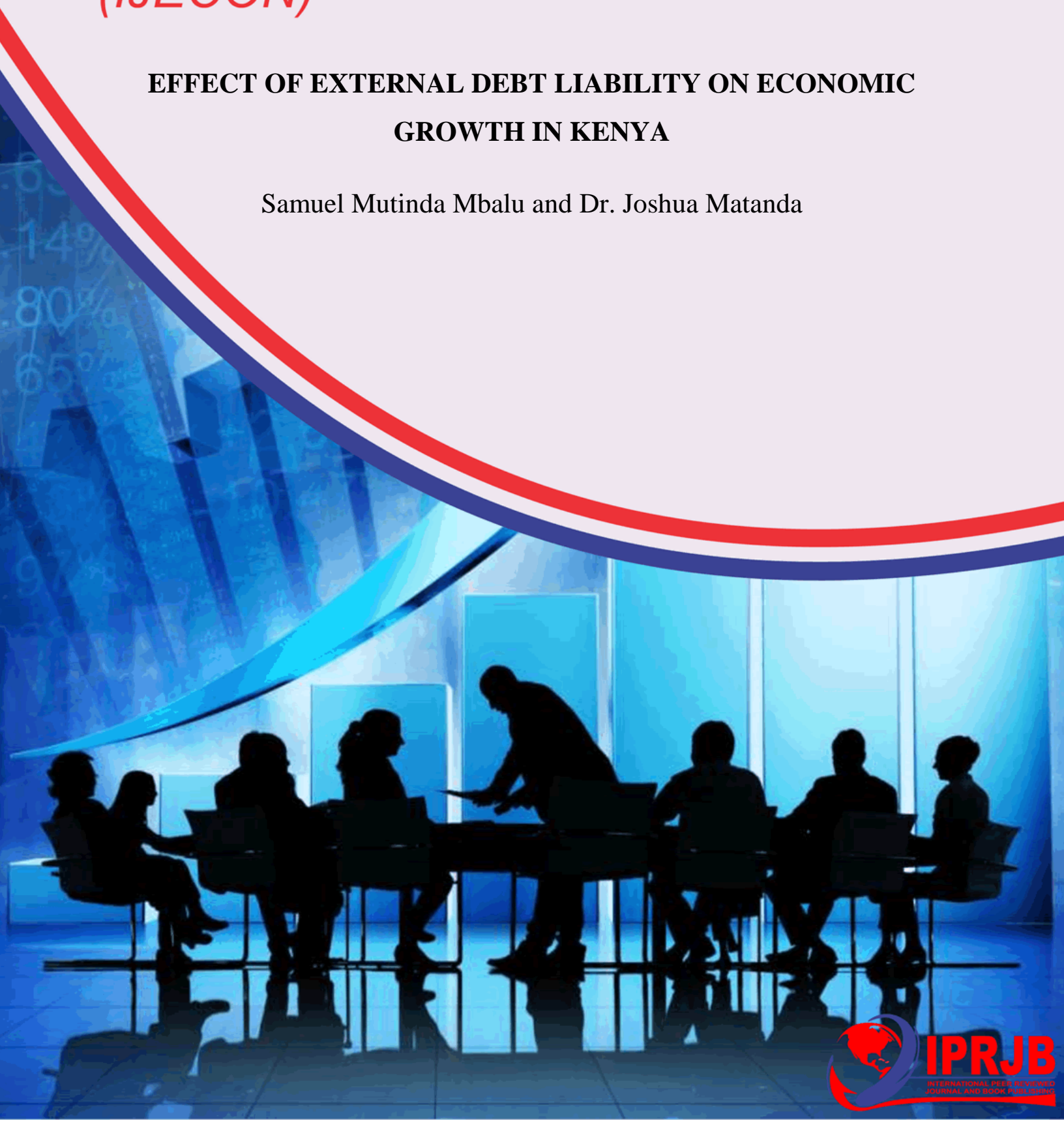
EFFECT OF EXTERNAL DEBT LIABILITY ON ECONOMIC GROWTH IN KENYA

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Abstract

Purpose: The purpose of the study was to evaluate the effect of external debt liability on economic growth in Kenya.

Materials and Methods: The descriptive research design was adopted. The target population was three institutions: The National Treasury, Kenya National Bureau of Statistics, and the World Bank. The study used time series data. The designated sample for this study covered a period of 43 years (1977–2019). Secondary data was used in this study. The data collected was on GDP of Kenya between 1977 and 2019, External public debt in terms of US dollars from 1977 to 2019, External private debt from 1977 and 2019 and external debt service payments from 1977 to 2019, all in US dollars. A data collection sheet was used to collect the data on the four variables. World Bank and World Development Indicator economic Meta data and published data by Central Bank of Kenya and the Kenya National Bureau of Statistics were the source of data for this study. The study used Eviews version 10 for analyzing and presenting study findings. The study employed multivariate time series and panel data regression analysis. The model employed GDP as a measure of economic growth and external public debt, external private debt, and external debt service payment as its main independent variables.

Results: The study found out that only the external private debt and the debt service payment showed bilateral causal relationship. External public debt and external private debt had a positive and significant effect on the GDP, indicating that external debt promotes economic growth in Kenya. The external debt service payment showed a negative and a significant effect on the GDP as well. The model explained 97% variability of the GDP as explained by the three independent variables combined. The 3% is attributed to other factors, not included in this study.

Unique contribution to theory, practice and policy: The study recommends a more robust multivariate model to be employed to include more macro-economic variables to explain economic growth. A decade-to-decade comparison can also be done to compare the effects of the external debt on Kenyan economic growth in different time intervals. Fiscal and monetary policies should be reviewed to encourage more domestic and foreign investments and discourage external borrowing to fund budget deficits or projects with low or no returns.

Key words: *External Debt Liability, Economic Growth.*

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1.0 INTRODUCTION

Sustainable economic growth is the goal of all developing economies (Shabbir, 2013). In the last few years developing economies have accumulated large external debt which hamper economic growth and are constraints to poverty alleviation (Arnone, Bandiera, & Presbitero, 2005), with the assumption that these loans will put them on a faster path to economic development. External debt refers to a part of the debt of a country borrowed/ obtained from foreign lenders such as international financial institutions, governments, and commercial banks (WB, IMF 2018). The main issue is whether external borrowing leads to economic growth (Ijirshar, Joseph & Godoo, 2016). In this debate two perspectives are arrived at. The two growth models, Neoclassical and Endogenous, depict that there is a positive association between external debt and economic growth. These models focused on debt and identified it as one of the causes for funding capital establishment. Funding of capital establishment through this implies that it impacts well on the investments hence promote economic growth (Adesola 2009). However, Krugman (1988) dispute this argument by declaring that external debt is a major weakness to economic growth. Nonetheless, it is only by increasing the rate of return than the cost of servicing the debt can external debt be fruitful.

There has been a consistent increase of the debt ratio in Europe. This has not only happened in Europe but in other parts of world as well. In the Global Financial Crisis held in 2008, it was noted that there was a 22 percent rise in the debt ratio to 88 percent in 2011 (Nautet & Meensel 2011). In countries like the United States of America and Japan, the debt had a 40 percent increase of the GDP in the USA and there was a fifty percent increase of the GDP in Japan (Nautet & Meensel, 2011). However, it is stimulating to note that the developing countries which on average had an initial debt ratio that was below that of the developed nations did not report a rise in the debt ratios. The economies of the world have shown a consistent recovery since 2010. The increasing trend of debt ratios in the developed countries is yet to be documented (Checcherita & Rother, 2010).

In Africa, different countries have been faced with the huge scarcity of capital due to low domestic savings hence result to external borrowing to supplement it and enhance economic growth and development. The high inflation and unemployment rates, rising capital flight and fiscal deficits were attributed to high population growth rates, policy failure and mistakes and low per capita output. The sub-Saharan African countries adopted an approach for development that relies heavily on borrowing from the foreign countries, both public and private sources. However, over the recent decades, it has been observed that the external debt stock has built up to a level now considered as unsustainable. In 1975, the sub-Saharan Africa's external debt stood at around 18 billion U.S. dollars, which then rose to about 220 billion U.S. dollars in 1995 (Khan & Ajayi, 2000). In 2019, South Africa had accumulated an external debt of 188 billion U.S. dollars, ranking as the country with the highest stock of external debt in the sub-Saharan Africa.

In Kenya, external debt has been on the rise and it has been a major concern among on the country's capacity to service the debt without affecting important services offered by the government. External debt, if not sustainable, imposes higher risk to the economic prosperity, as its servicing which is also an indicator of higher current account deficit, may lead to debt overhang in a country (Ali & Mustafa, 2009). In any economy, debt either public or publicly guaranteed, which also includes the contingent liabilities, plays a crucial role in achieving economic progress (Were, 2001). According to Were (2001) debt servicing ratio (debt service

payments as a ratio of total export of goods and services) in the early 1970s was too low to cause concern when compared with that of African countries which was over 10 per cent in 1972. However, the oil crisis of 1973/74 created severe balance of payments (BOP) problems and changed the picture. To meet the BOP crisis, the government resorted to heavy external borrowing. In 1977 exports increased thereby reducing the debt-service ratio temporarily in to 14 percent after which it started increasing. In the years preceding 1980's, the world experienced economic recession because of the second oil prices shocks and the commodity market declined which caused a decline in Kenya's export earnings. Therefore, external debt ratio to GDP increased since 1977 and has remained critical (above 50%) until 1999 when it started decreasing.

External Debt Liability

External debt is the money borrowed from a foreign lender to finance activities and operations of the debtor country. The lenders include governments, financial institutions such as IMF and World Bank, commercial banks, among others. The principal and interest accruing from the loans are paid using the initial currency, through a foreign exchange. The accumulation of such debt over a long period of time can be attributed to the debtor country's inability to produce sufficient goods and sell them at a profit, thus encountering a debt crisis resulting from inability repay the debt. This forms an external debt liability, and the country can be said to be in sovereign default, for failure or refusal to repay the debt.

The burden of external debt is an impediment to the stability of the economy which inhibits its growth as well as the country's ability to reduce poverty, lower unemployment rates and enhance major economic structural reforms. This is especially when the external debt goes over and above the GDP threshold level set by legislature where in Kenya it is 50%. The external debt is usually in the form of a tied loan, such as humanitarian needs, say famine, or for infrastructure development, and therefore the borrowing country secures food and resources from the country financing it. With increased fiscal indiscipline, some of these funds are used for the wrong purposes, and a greater percentage is misappropriated, hence the debt service obligations fail for the given period of repayment. The lending country or institution ends up holding back assets that could have otherwise benefited the borrowing country, because of defaults, and worst still, bankruptcy.

Statement of the Problem

Kenya's external debt stock, both public and private, has increased more than four folds since 2000 (Shangai, 2019). The public external debt increased from 5 billion USD to 18 billion USD whereas external private debt stock increased from 48 million USD to the current 673 million USD. This is due to Kenyan government persistent failure in collecting necessary incomes to sustain its expenditure and the unceasing dependence on both the domestic and external debts for funding development agendas (Putonoi & Mutuku, 2013). Additional funds may be created when public external and private external debt stock are increased. However, this can also create problems within the external and internal scope of the country, such as insolvency. Policymakers are concerned that the high public debt or increase of it can erode a country's sovereign rating, especially when the economy size does not equally match or support it (Nord, Harris & Giugale , 2013). There is limited research and literature concerning the link between macroeconomic variables and the external debt in Kenya (Putoonoi & Mutuku, 2013).

Various studies which have been done to ascertain this argument on the effect of external debt to economic development. Pattillo, Poirson & Ricci (2002), Karagol (2002), Geiger (1990), Were (2001), Kalima (2002), Schclarek (2004) and Chowdhurty (1994) are some of the scholars who have done research and supported this argument. A variety of analytical methods and tools were used in these studies hence the results differed from one country to another. Mweni (2014) argues that it is inappropriate to generalize the connection between economic development and external debt. Mweni continues, is because the findings differ from one country to another as a result to the differences in macroeconomic environments and their understanding of external debt economic growth relationships which should be restricted to each country. Therefore, there exists a knowledge gap where no study has been done for the time duration or period proposed in this study. In line with Arai et al (2012) argument that developed countries increased external debt in the last 30 years, this study will seek to examine Kenyan case in this context. Further, the study pursued to answer the question on the connection between public and private external debt stock on economic progression in Kenya and its effect by performing an empirical examination using multivariate time series and panel data. Kenya per capita debt in 2018 was 1,029 dollars per inhabitant. In 2017 it was 865 dollars, afterwards rising by 164 dollars, and if we again check 2008, we can see that then the debt per person was 406 dollars.

2.0 LITERATURE REVIEW

2.1 Theoretical Review

Keynesian Theory

The origin of Keynesian Theory dates back in (1929-1939) that was characterized by Great Depression. It was advanced by John Maynard Keynes in 1936 in a book titled 'The general theory of employment, money and Interest rates. The basic premise of the theory is that economy is not always at full employment. As such, it can either be at above or below its potential. The Great Depression is characterized by a rise in the level of unemployment resulting into failure of many businesses. The economy is operational lower than its potential. The external debt will always influence the economic progression as long it is utilized to productive economic activities (Metwally & Tamaschke, 1994). In the model of Keynes, external debt is more significant than the domestic debt for it can be put into long term income generating projects. This will have in mind the caution of repaying the debt hence misuse and misappropriation minimized. Consequently, resource is added to the economy of a country. However, this must be repaid eventually. The government often responds by increasing tax so that it can be able to meet the rising expenditure. This in turn causes an immediate macro-expansionary impact in the economy thereby leading to a lower multiplier as   opposed to public expenditure which is funded through public debt. This theory is applicable to the research as it speaks to external public and private debt. Hence, the study focused on identifying if external debt adds value to the economy as the model states.   In this approach, expenditure causes income. When the government consumes more thereby increasing expenditure, domestic absorption is also increased. If the assumption of aggregate supply (domestic output) is held constant or remains unchanged, there is more importation of the goods to supply the output gap that arises from the high demand. Eventually, this high rise in imports relative to exports will deteriorate the trade balance thereby causing a rise in the current account deficit. The result on the present account balance by the budget shortage becomes direct.

Mundell (1996) added two more variables in the Keynesian model. These variables are the rate of interest and exchange rate. When the expenditure of the government rises, the local interest also increases relative to the rates in the international market. These difference in interest rate pulls capital inflows from abroad (foreign investments) thereby making the local currency attractive. The effect of this is that it makes the imports more affordable or cheaper when compared to the exports. This deteriorates the present account deficit. Consequentially, the outcome of the budget deficit on the present account deficits is indirect. There is an expansionary effect with substitution of current levy. The reason for this is that the increase in public expenditure which results from the rise in taxes. This results into a lower and different multiplier as compared to debt-financed public expenditure. In macro-economic terms therefore, public debts result into no contradicting forces (Savvides, 1992). The model was relevant to this study as it explains how external debt variables (external government debt, private institutions' external debt, and external debt servicing) influence economic growth.

2.2 Conceptual Framework

Conceptual framework is a tool which provides variational analysis linked to the research's goal. In this study the conceptual framework to be used is presented in Figure 1.
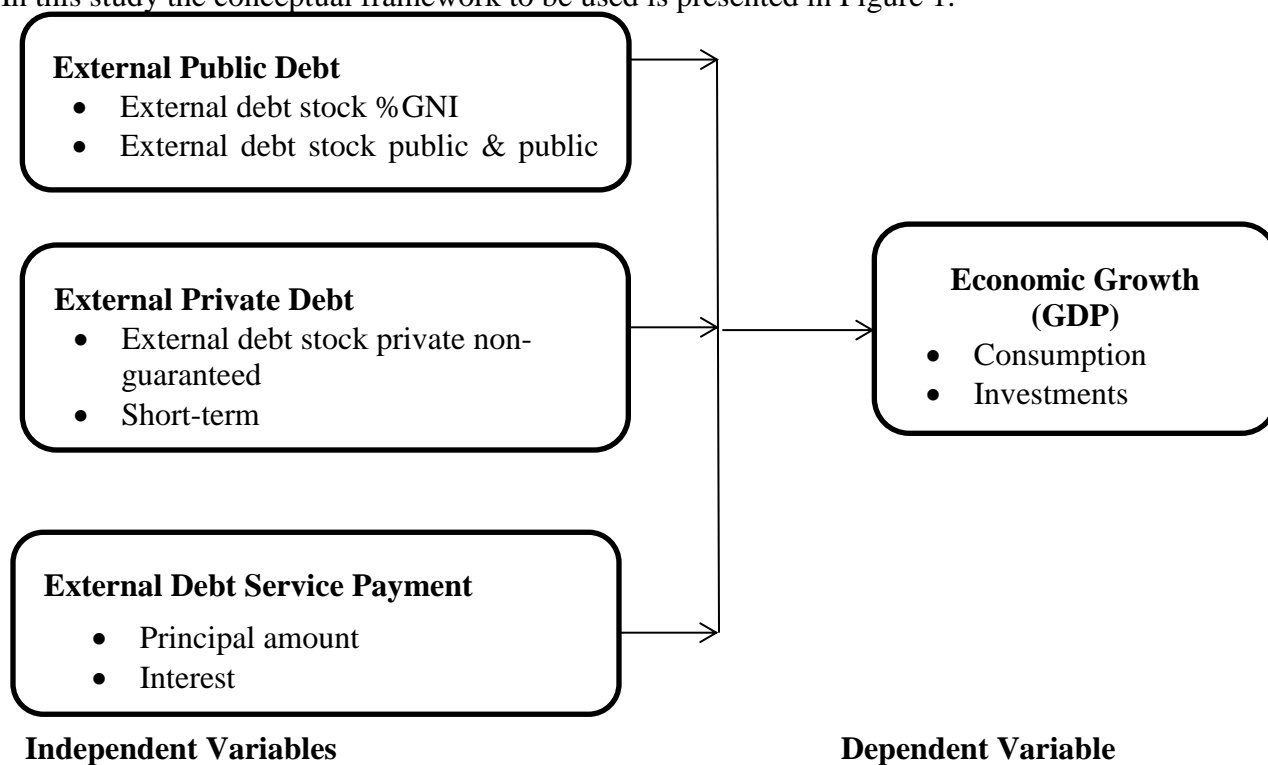

External Public Debt
- External debt stock %GNI
- External debt stock public & public

External Private Debt
- External debt stock private non-guaranteed
- Short-term

External Debt Service Payment
- Principal amount
- Interest

Economic Growth (GDP)
- Consumption
- Investments

   Independent Variables   Dependent Variable

Figure 1: Conceptual Framework

3.0 METHODOLOGY

The descriptive research design was adopted. The target population was three institutions: The National Treasury, Kenya National Bureau of Statistics, and the World Bank. The study used time series data. The designated sample for this study covered a period of 43 years (1977–2019).. Secondary data was used in this study. The data collected was on GDP of Kenya between 1977

and 2019, External public debt in terms of US dollars from 1977 to 2019, External private debt from 1977 and 2019 and external debt service payments from 1977 to 2019, all in US dollars. A data collection sheet was used to collect the data on the four variables. World Bank and World Development Indicator economic Meta data and published data by Central Bank of Kenya and the Kenya National Bureau of Statistics were the source of data for this study. The study used Eviews version 10 for analyzing and presenting study findings. The study employed multivariate time series and panel data regression analysis. The model employed GDP as a measure of economic growth and external public debt, external private debt, and external debt service payment as its main independent variables. The variables were transformed into natural logarithms for easier comparison and to eliminate heteroscedasticity. The analysis of unit root test using the Augmented Dickey-Fuller unit-root test was performed on each of the variables incorporated in the model to test for stationarity of the data. It revealed that all variables were integrated of order one, I (1). The Cointegration test failed, indicating that there was no long run equilibrium between the variables. VAR (1) model was fit, and Granger causality tested for the variables.

4.0 RESULTS

4.1 Descriptive Statistics

Table 1 is a presentation of the descriptive statistics of the initial data transformed into respective natural logarithms. It is evident that the log-data is positively skewed for the Gross Domestic product (GDP), External Public Debt (EPD), and External Debt Service Payment (EDSP), whereas the log-data for External Private Debt (EPrD) is negatively skewed. From the Jarque-Bera test for normality at 5% significance level, while the log-data for EPrD and EDSP is not normally distributed, given the p-value is less than the significance level, the rest of the variables have their data normally distributed since p-value is greater than 0.05.

For the period between 1977 and 2019, the GDP had an average of 23.47436, with a maximum of 25.28242 and a minimum of 22.22609. The standard deviation of GDP is 0.919166, indicating the deviation from the mean value. The mean values, on same period, for EPD, EPrD, and EDSP were 22.39230, 19.65428, and 20.27254 respectively. Again, the standard deviations for EPD, EPrD, and EDSP were 0.738042, 1.017194, and 0.540447 respectively.

Table 1: Descriptive Statistics

| Statistic	GDP	EPD	EPrD	EDSP
Mean	23.47436	22.39230	15.99767	20.27254
Median	23.28018	22.39913	19.76823	20.20050
Maximum	25.28242	24.12676	20.74385	22.22124
Minimum	22.22609	20.74431	0.000000	19.18945
Std. Dev.	0.919166	0.738042	7.792795	0.540447
Skewness	0.589078	0.184896	-1.564068	1.414506
Kurtosis	1.956363	3.328642	3.518536	6.410074
Jarque-Bera	4.438372	0.438513	18.01361	35.17385
Probability	0.108698	0.803116	0.000123	0.000000
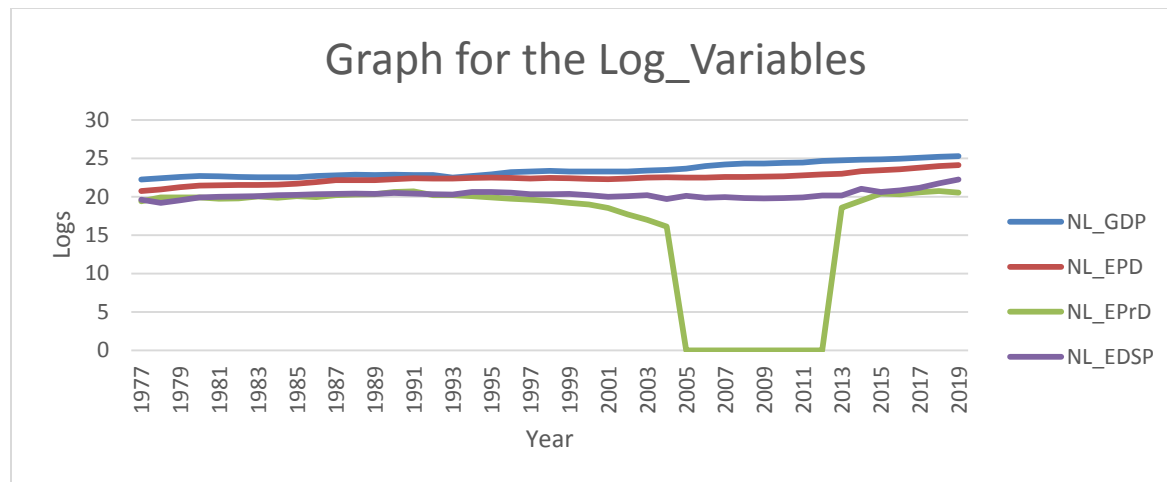
Figure 1: Graphical Representation of the Variables

4.2 Unit Root Test

To ensure stationarity in the time series, unit root test was conducted. For a variable to be considered to be stationary, it should not have a unit root at level, denoted by I (0). A variable is said to be non-stationary if it has one or more-unit root denoted by I (d). The test for stationarity was done using the Augmented Dickey-fuller test statistic. The results were recorded to show the unit root tests of the variables at level l (0) and intercept. It was demonstrated that all the variables were not stationary at level and intercept.

4.2.1 Unit Root Test for GDP

The natural log of GDP was found to be non-stationary at the intercept and level, I (0), because the ADF test statistic had a probability value of 0.9946 which is not significant at 5% level of significance. Therefore, we fail to reject the null hypothesis that GDP has unit root.

Table 2: Unit Root Test for GDP

Null Hypothesis: GDP has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		0.902656	0.9946
Test critical values:	1% level	-3.596616	
	5% level	-2.933158	
	10% level	-2.604867	

4.2.2 Unit Root Test for EPD

The natural log of EPD was found to be non-stationary at the intercept and level l (0) because the ADF test statistic had a probability value of 0.9416 which is not significant at 5% level of significance. Therefore, we fail to reject the null hypothesis that EPD has unit root.

Table 3: Unit Root test for EPD

Null Hypothesis: EPD has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-0.110239	0.9416
Test critical values:	1% level	-3.596616	
	5% level	-2.933158	
	10% level	-2.604867	

4.2.3 Unit Root Test for EPrD

The ADF test statistic had a probability value of 0.9998 which is not significant at 5% level of significance implying that the natural log of EPrD was not stationary at the intercept and level I (0). Therefore, we fail to reject the null hypothesis that EPrD has unit root.

Table 4: Unit Root Test for EPrD

Null Hypothesis: EDPR has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		2.030390	0.9998
Test critical values:	1% level	-3.646342	
	5% level	-2.954021	
	10% level	-2.615817	

4.2.4 Unit Root Test for EDSP

The probability value of 0.9813 is not significant at 5% significance level for the ADF test of the natural log of EDSP. This implies that we fail to reject the null hypothesis of unit root process, hence not stationary.

Table 5: Unit Root Test for EDSP

Null Hypothesis: EDSP has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		0.414218	0.9813
Test critical values:	1% level	-3.596616	
	5% level	-2.933158	
	10% level	-2.604867	

4.3 Unit Root Tests on Differenced Series

In order to make the variables stationary, it is important to difference the series and then test for unit root. For uniformity, all the natural log data series were iterated for the first difference to determine stationarity. It was demonstrated that all the variables were stationary after first difference, an indication that they are all integrated of order one, I (1).

4.3.1 Unit Root Test for GDP First Difference

The natural log of GDP was found to be stationary at first difference I (1) because the ADF statistic had a probability value of 0.0006 which is significant at 5% level of significance. Therefore, we rejected the null hypothesis that the first difference of GDP had a unit root.

Table 5: Unit Root Test for GDP First Difference

Null Hypothesis: D(GDP) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.604489	0.0006
Test critical values:	1% level	-3.600987	
	5% level	-2.935001	
	10% level	-2.605836	

4.3.2 Unit Root Test for EPD First Difference

The probability value of the ADF test statistic is 0.0087 which is significant at 5% level of significance. This implied that the first difference of the natural log of EPD is stationary. Hence, we rejected the null hypothesis that the first difference of EPD had a unit root.

Table 6: Unit Root Test for EPD First Difference

Null Hypothesis: D(EPD) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.654999	0.0087
Test critical values:	1% level	-3.600987	
	5% level	-2.935001	
	10% level	-2.605836	

4.3.3 Unit Root Test for EPrD First Difference

The natural log of EPrD was found to be stationary at first difference I (1) because the ADF statistic had a probability value of 0.0003 which is significant at 5% level of significance. Therefore, we did reject the null hypothesis that the first difference of EPrD had a unit root.

Table 7: Unit Root Test for EPrD First Difference

Null Hypothesis: D(EPrD) has a unit root
Exogenous: Constant
Lag Length: 7 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.985940	0.0003
Test critical values:	1% level	-3.639407	
	5% level	-2.951125	
	10% level	-2.614300	

4.3.4 Unit Root Test for EDSP First Difference

The natural log of EDSP was found to be stationary at first difference I (1) because the ADF statistic had a probability value of 0.0000 which is significant at 5% level of significance. Therefore, we rejected the null hypothesis that the first difference of EDSP had a unit root.

Table 8: Unit Root Test for EDSP First Difference

Null Hypothesis: D(EDSP) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.661585	0.0000
Test critical values:	1% level	-2.622585	
	5% level	-1.949097	
	10% level	-1.611824	

4.4 Cointegration Test

The series are not stationary at intercept and level I (0), but stationary after the first difference, implying that they are integrated of order one I (1). We therefore carry out a Cointegration test to determine whether the linear combination of these series produce a stationary time series. The Cointegration test also determines if the series have a long run equilibrium and/or share a common underlying stochastic trend. The Johansen Cointegration test was carried out at 5% level of significance. The null hypothesis is that there is no Cointegration equation between the series. The unrestricted Cointegration rank test using the trace statistic indicated that there is no Cointegration at the 0.05 level. Therefore, the variables do not show a long-run relationship. The summary is as given in table 10.

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Table 9: Johansen Cointegration Test

Sample (adjusted): 1979 2019
Included observations: 41 after adjustments
Trend assumption: Linear deterministic trend
Series: EPD EPrD EDSP GDP
Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None	0.251030	25.16161	47.85613	0.9143
At most 1	0.188135	13.31031	29.79707	0.8769
At most 2	0.088948	4.765021	15.49471	0.8333
At most 3	0.022801	0.945658	3.841466	0.3308

Trace test indicates no cointegration 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	0.251030	11.85130	27.58434	0.9385
At most 1	0.188135	8.545286	21.13162	0.8673
At most 2	0.088948	3.819363	14.26460	0.8779
At most 3	0.022801	0.945658	3.841466	0.3308

Max-eigenvalue test indicates no Cointegration at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

4.5 Vector Autoregressive (VAR)

Johansen Cointegration test revealed there is no Cointegration between the variables. This implies that there is no long-run relationship between the variables. We therefore carried out an unrestricted VAR test for short-run relationship. The value of R-squared is 0.9765 which is close to one (1). This shows that the regression fits almost perfectly when the dependent variable is predicted by the independent variables.

Table 10: Vector Autoregression Estimates

Sample: 4 - 43				No. of obs	=	40	
Log likelihood	= 38.59702			AIC	= -1.629851		
FPE	= .0114996			HQIC	= -1.538254		
Det (Sigma_ml)	= .0084997			SBIC	= -1.376519		
Equation	Parms	RMSE	R-sq	chi2	P>chi2		
GDP	6	.099998	0.9765	1659.083	0.0000		

GDP |	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]	
L2. |	-.1077761	.024241	-4.45	0.000	-.1552876	-.0602645
L3. |	-.1691423	.0239738	-7.06	0.000	-.21613	-.1221545
EPD |	.9030545	.0685448	13.17	0.000	.7687092	1.0374
EPrD |	.1865109	.0052304	35.66	0.000	.1762595	.1967623
EDSP |	-.0475176	.0054318	-8.75	0.000	-.0581638	-.0368715
cons |	.2691702	.0719043	3.74	0.000	.1282404	.4100999

4.5.1 Determining the Optimal Lag Length

Table 12 shows the lag length selection criteria shows that the optimal lag for the model is 1 as indicated by the lag length selection criteria. The determination of lag length is meant to inform the number of lags to be included in the Granger causality test.

Table 12: VAR Lag Order Selection Criteria

VAR Lag Order Selection Criteria
Endogenous variables: GDP EPD EPRD EDSP
Exogenous variables: C
Sample: 1977 2019
Included observations: 40

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-187.4961	NA	0.169202	9.574806	9.743694	9.635870
1	-12.29119	306.6086*	5.94e-05*	1.614559*	2.458999*	1.919882*
2	-0.952468	17.57501	7.69e-05	1.847623	3.367615	2.397204
3	15.78699	22.59826	7.92e-05	1.810651	4.006194	2.604490

* indicates lag order selected by the criterion

4.6 Model Diagnostics

To ascertain the goodness of fit and stability of the VAR model, the serial correlation, normality and Heteroskedasticity tests were carried out.

4.6.1 Testing for Serial Correlation

According to table 13, the probability values at lag 1 are greater than the 5% level of significance. Hence, the null hypothesis that the model residuals have no serial correlation was not rejected.

Table 11: VAR Residual Serial Correlation LM Tests

Null hypothesis: No serial correlation at lag h
Sample: 1977 2019
Included observations: 41

Lag	LRE* stat	Df	Prob.	Rao F-stat	df	Prob.
1	22.94657	16	0.1152	1.511728	(16, 77.0)	0.1173

4.6.2 Normality Test

The overall normality test using shows a joint probability value of 0.9700, table 4.14, which is greater than the 5% level of significance, hence the null hypothesis that the residuals are multivariate normal was not rejected.

Table 12: VAR Residual Normality Tests

Orthogonalization: Cholesky (Lutkepohl)
Null Hypothesis: Residuals are multivariate normal
Sample: 1 41
Included observations: 41

Component	Jarque-Bera	Df	Prob.
GDP	0.666390	2	0.7166
EPD	0.090823	2	0.9556
EPrD	0.959354	2	0.6190
EDSP	0.962559	2	0.6180
Joint	2.679126	8	0.9700

The normality test for the VAR residuals is significant since the p-value is greater than 5% significance level and hence we do not reject null hypothesis and conclude that the residuals are normally distributed.

4.6.3 Heteroskedasticity Tests

Heteroskedasticity test is shown in table 15. The null hypothesis is that the residuals are homoscedastic, whereby the probability value is greater than the 5% significance level, hence the null hypothesis was not rejected.

Table 13: VAR Residual Heteroskedasticity Tests (Levels and Squares)

Sample: 1 42
Included observations: 37
Joint test:

Chi-sq	df	Prob.
309.0179	300	0.3476

4.7 Granger Causality Test

Granger causality test is a test aimed at determining whether the past and current lagged values of a particular variable can predict the future values of another variable. The table 16 is a summary of the granger causality test.

The test shows there is no causal relationship between EPrD and EPD. This signified that the public and publicly guaranteed and the private non-guaranteed external debts do not affect each other.

There is a one-way causal relationship between EDSP and EPD. The public and publicly guaranteed external debt granger causes the external debt service payments.

There is no causal relationship between GDP and EPD. This signified that the gross domestic product and the public and publicly guaranteed external debt do not affect each other.

There is a one-way causal relationship between EPrD and EDSP. This implied that the private non-guaranteed external debt granger cause the external debt service payment.

There is no causal relationship between GDP and EPrD. This signified that the gross domestic product and the private non-guaranteed external debt do not affect each other.

There is no causal relationship between GDP and EDSP. This signified that the gross domestic product and the external debt service payment do not affect each other.

Table 14: Pairwise Granger Causality Tests

Sample: 1977 2019
Lags: 1

Null Hypothesis:	Obs	F-Statistic	Prob.
EDSP does not Granger Cause GDP	42	0.17773	0.8379
GDP does not Granger Cause EDSP		2.05083	0.1434
EPrD does not Granger Cause GDP	42	1.00514	0.3760
GDP does not Granger Cause EPrD		0.05985	0.9420
EPD does not Granger Cause GDP	42	0.16304	0.8502
GDP does not Granger Cause EPD		2.47593	0.0983
EPrD does not Granger Cause EDSP	42	6.06402	0.0054
EDSP does not Granger Cause EPrD		2.89061	0.0685
EPD does not Granger Cause EDSP	42	4.03103	0.0263
EDSP does not Granger Cause EPD		0.51536	0.6016
EPD does not Granger Cause EPrD	42	0.63723	0.5346
EPrD does not Granger Cause EPD		2.36768	0.1081

4.8 Correlation between the Dependent and Independent Variables

Correlation analysis was done to identify highly correlated economic variables and to ensure no multicollinearity in the models built. Table 17 shows a correlation coefficient of 0.913169 for the EPD. This implies that there was strong positive correlation between the External Public Debt and Gross Domestic Product for the period between 1977 and 2019. The table also shows correlation coefficient of 0.020693 on EPrD. This indicated that there was a weak positive correlation between External Private Debt and Gross Domestic Product over the same period. The correlation coefficient for EDSP is 0.728928, which implies that there was a strong correlation between External Debt Service Payment and Gross Domestic Product over the period between 1977 and 2019. The correlation coefficients results are summarized in Table 17.

Table 15: Correlation Coefficients

	GDP	EPD	EPrD	EDSP
GDP	**1.000000**	0.913169	0.020693	0.728928
EPD	**0.913169**	1.000000	0.095177	0.854645
EPrD	**0.020693**	0.095177	1.000000	0.408168
EDSP	**0.728928**	0.854645	0.408168	1.000000

4.9 Multicollinearity Test

Using the Variance Inflation Factor (VIF), as shown in table 18, a test was carried out to determine if there is multicollinearity between the predictors. The values of the centered VIF are

less than 10, hence no severe multicollinearity between the independent variables, hence they all report different variance of the dependent variable.

Table 18: Multicollinearity Test

Variance Inflation Factors
Sample: 1977 2019
Included observations: 41

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
C	4.557488	1625.240	NA
EPD	0.021302	3813.037	4.041625
EPrD	9.67E-05	10.87229	2.045718
EDSP	0.044401	6511.871	4.517270

4.10 Summary of the Hypothesis Testing and Model Estimation

This gives the summary of the significance role of the various variables on gross domestic product (GDP). Upon estimating the VAR model in table 19 the coefficients obtained are interpreted in table 19.

Table 19: Hypothesis Testing Results

Hypotheses	Results	Conclusion
H_{01}: External public debt has no significant effect on gross domestic product.	Positive and statistically significant	Rejected H_{01}
H_{02}: External private debt has no significant effect on gross domestic product.	Positive and statistically significant	Rejected H_{02}
H_{03}: External debt servicing has no significant effect on gross domestic product.	Negative and statistically significant	Rejected H_{03}

The signs of the coefficients of the explanatory variables also met the expectation from economic theory. The residuals also satisfied all the necessary assumptions. The diagnostic test results further yielded sufficient evidence of stability of the models and correct specification thus the estimated models are fit for forecasting. In table 11, the coefficient of determination R-squared (0.9765) shows that the independent variables in the VAR (1) model explains 97% of the systematic variations in GDP whereas the remaining 3% can be attributed to other variations outside the model. The adjusted R-squared of 98% again shows that the model is a good fit. The strong relationship between the variables is also confirmed by a high F-statistic, indicating that the coefficients are non-zero, hence together affect the GDP.

Substituting the values in model 2, the model becomes:

$$GDP = 0.2691702 + 0.9030545EPD + 0.1865109EPrD - 0.0475176EDSP \dots\dots\dots\dots\dots.2$$

The external public debt coefficient was 0.9030545 meaning that when external public debt grows by 1 GDP increases by 0.9030545. This positive effect of external public debt to GDP is significant because probability 0.0000 is less than the significant level of 5%. External private debt coefficient was 0.1865109 with a probability of 0.0000 which is less than the significant level. Therefore, coefficient of the external private debt is also significant to economic growth. External debt service payment coefficient was negative 0.0475176 and was also significant at 5% with a probability of 0.0000.

Summary of the hypothesis testing is shown in table 19. From the table we rejected all the hypotheses namely: H_{01}, H_{02}, and H_{03} because the probabilities were less than the threshold of 5% significance level. The interpretation of this is that external public debt, external private debt, and external debt service payment have significant influence on economic growth.

5.0 SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

This study aimed at examining the effects of external debt liability on the growth of Kenyan Economy, covering a period of 43 years, between 1977 and 2019. This was necessitated by the continued debate about increasing debt in most of the developing countries, and especially in Africa. The panel data used to fit the time series model in the study was GDP as a proxy for economic growth, the dependent variable, the external public debt, external private debt, and external debt service payment as the independent variables. To ensure easier comparison and avoid the aspect of heteroscedasticity, the data was transformed into the individual logarithms from which the descriptive statistics were derived.

The time series analysis in this context required that the data be stationary to allow various statistical analysis, tests, and models' fitting. A unit root test using Augmented-Dickey Fuller test was carried out to ascertain stationarity. All variables failed integration of order zero, that is, in their initial logarithmic form. Upon first differentiation, the variables were stationary, hence found to be integrated of order one, I (1).

It was also important to assess the short-run and long-run relationships between these economic variables and test the hypotheses pertaining to fluctuations and growth. The Johansen Cointegration test was carried out to determine if there is any deviation from the long-run equilibrium. The test revealed that there was no Cointegration. This is also consistent with the descriptive statistics which show the fluctuations in different time intervals, and especially following the global financial crisis of 2008, the 2007/08 and 2017 Kenyan elections' violence. A multivariate time series model, Vector Autoregression (VAR) model was fitted to establish the short-run relationships between these economic variables. A VAR (1) model was fit, where the lag one was attributed to the data being annual and order 1. Various model diagnostic tests were carried out and passed, an indication that the model was adequate. The Granger Causality test only revealed a bilateral causal relationship between external private debt and external debt service payment.

The estimation of coefficients of the VAR model was done using Least Squares method which showed that both the external public and private debts had a positive effect on GDP and significant coefficients. External debt service payment had negative and significant coefficient. The model explains 97% variation in the dependent variable, GDP, implying that the three independent variables taken together have a great impact towards the GDP. The effect from other

causes is captured by the 3% and can be explained by other macro-economic variable not included in this study.

Conclusion

This study found that there is a positive and significant effect of external public debt on the gross domestic product. This implies that the external public debt has been effective in enhancing the economic growth of Kenya for the past four decades. Therefore, the high borrowing by the Kenyan government should not cause an alarm to the Kenyans, as this is helping spur the economic growth which translates to better livelihood regarding per-capita income. The external private debt has a positive and significant effect on the gross domestic product. Again, this imply that external private debt has enhanced Kenya's economic growth through the private investment, both domestic and foreign. The private sector has been resourceful in creating employment and in the corporate social responsibilities, as well as the overall government revenue through paying of taxes. The external debt service payment has a negative and significant effect on the gross domestic product. This shows that the debt servicing yields a negative impact on the growth of the gross domestic product, which is an indication that huge debt repayment to the GDP ratio discourages the growth of the economy. The rate of borrowing by the Kenyan government has increased over the time whereas the growth of the economy has been slow. In a bid to service the loans from the revenue raised, different resources have been depleted which has drained the economy off its resources, translating to low growth of the economy.

Recommendations

This study showed that external public debt has a positive impact towards economic growth. External public borrowing should therefore be encouraged but with a focus on the development agenda of the country, including capital projects such as in manufacturing, infrastructure, and healthcare. The policy makers in the country should consider, among other factors, the viability of the projects being sponsored through the money borrowed. The focus should be on those projects with high capital returns and with increasing human productivity to spur the growth of the economy. Misuse of borrowed money should be avoided by establishing clear guidelines for terms and conditions and the strategies for implementing the target projects. The fiscal discipline should rally accountability in all levels of government, where, together with respective laws of the country, people found culpable of public funds' misappropriation and theft carry the burden of paying off for the losses, including fines and legal suits.

The external private borrowing should also be encouraged as it is a driver of economic growth following the setting up industries, creation of employment, and complementing the government efforts in the enhancing the social development. The laws governing the regulation of various businesses should be reviewed to encourage local investment. The various business permits, licenses and tariffs have been a great hindrance to both local and foreign investors establishing businesses in the country, which when reviewed, can promote local mass production of goods and services that are often imported into the country. When the government reduces the cost of starting and doing business, this will ensure that the businesses are able to generate revenue for the government for a longer period.

External debt service payment was found to have a negative effect on economic growth. Appropriate planning should be done and strategies which enhance the stability of the economy

should be adopted to check external borrowing and debt servicing procedures. The government should strive to adopt policies enabling the reduction of debt stock to alleviate the country from the strains exerted by the external debt payment on the Kenyan economy. The borrowed money should be directed to capital development which guarantees high returns to facilitate repayment of the borrowed money. The loans should be long-term and the repayment period for of the external debt stock should be staggered to allow for enough time for the investments to yield some returns to the economy. The government should consider investing the money borrowed in the construction and revival of industries which have a higher proliferation and can easily produce export-worth goods to obtain a good balance-of-payments. There should be a review of fiscal and monetary policies, to encourage generation of revenue without having to rely heavily on taxes, which have a great negative impact towards the residents. The government to create policies that diversifies income to avoid over taxation of taxpayers to settle external debt stock and ensure minimum tax evasion. The government should diversify capital formation and avoid over-reliance on the external debt. The diversification will enhance an increase in investments that spur economic growth. The government should strive to strengthen the Kenyan Shilling against the dollar to promote foreign investments while reducing demand for foreign goods. The government should open areas with high potential to foreign investment, both regional and global, as currently Kenya is considered an investment destination and hub in the horn of Africa.

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