Kenya's Debt Crisis and Public Investment

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Abstract: *With perennial fiscal deficits, Kenya resorted to borrowing to bridge the budgetary gap. For the last one decade, there has been a steady increase in the debt which now stood at Kshs 6.28 trillion in March 2020. However, literature is scanty on the relationship between public debts and public investment in Kenya. This study therefore, employees Autoregressive Distributed Lag Model to investigate the effect of Kenya's public debt on public investment. Secondary data covering 1980-2019 was utilized. The study finds that domestic debt, debt service and inflation, have adverse effect on public investment in the short run but, in the long run, these variables improve public investment except for debt service. In addition, the effect of external debt on public investment, moves from positive to negative in the short and long-run respectively. It was recommended that Kenya should seek to restructure its external debts to free up some financial resources and enhance investment in productive public sectors as a mitigation measure.*

Keywords: Public Debt, Public investment, ARDL, External debt, Domestic Debt

1. Introduction

Any country around the world aspires to increase the level of economic activities through private and public investment for posterity. More investment ensures sufficient revenues for further investment and secures welfare of the nation. Public investment is very critical for economic growth and development (Saunweme & Mufandaedza, 2013). Infrastructural development (roads, rail, water and sewerage systems, ports) accounts for the largest share of the government's development expenditure in most developing countries with Kenya as an example. These helps in smoothening production and distribution of goods and services. Countries that have realized greater development have invested heavily in the infrastructure. Good infrastructure is an incentive to the private sector investment since it provides effective and efficient movement of both people and commodities.

An analysis of various statistical abstracts and economic surveys since 1970, indicate that Kenya's public investment accounts for less than 20 percent of the total expenditure. For instance, the average public expenditure between 1970 and 1979 was 19.1 percent while during 1980-89, public investment was 13.4 percentage of the total government expenditure. For the period 1990-99, government investment accounted for 10.1 percent of the total spending while during 2000-09 public invested accounted for 12.3 percent.

Ideally, governments rely on both physical and monetary policies to raise the required revenues for recurrent and development expenditure. However, many countries record fiscal deficits which demand that they have to get resources elsewhere to bridge the deficits. In this case, many governments have resorted to borrowing both internally and externally. During 1980's and period earlier, Kenya was among countries which received financial assistance from International Monetary Fund (IMF) and the World Bank. This was mainly for infrastructural expansion and incorporation of the rural economy into import substitution strategies (Putunoi&Mutuko, 2013). However, due to poor governance that was riddled with rampart corruption, the country witnessed a reduction of this assistance in 1990's which led to financial crises, and hence, Kenya had to borrow heavily to finance its perennial budgetary deficits. Initially, there was occasional debt rescheduling coupled with domestic borrowing which worked. Nevertheless, Kenya's debts began to raise steadily. For instance, as of December 2008, Kenya's public debt had stood at Ksh 867 billion with Ksh 413.5 billion in external debts, and by December 2018, external debts stood at Kshs.3.568 trillion while the domestic debt was Kshs. 2.856 trillion (KNBS, 2019). Currently, Kenya's debt burden stands at 6.28 trillion (Central Bank, 2020).

Economic theories (traditional and modern) argue that reasonable public debts are likely to improve the level of economic activities and therefore, growth (Egbetunde, 2012). Nevertheless, the reason for borrowing will determine whether such debts will enhance public investment or not. For example, if thegovernment borrows to finance debt serving, smoothen consumption, or for recurrent expenditure as opposed to development spending, this will have no effect on public investment. Debt overhang theory holds that both the stock of public debt and its service affect growth by discouraging private investment or altering the composition of public spending. Higher external interest payments can increase a country's budget deficit, thereby reducing public savings if private savings do not increase to offset the difference. This in turn, may either drive up interest rates or crowd out the credit available for private investment and thus depressing the economic growth. Debt service may discourage growth by squeezing the public resources available for investment in infrastructure, human capital, health and agriculture sectors (Clements *et al.,* 2005).

Empirically, Sánchez-Juárez and García-Almada (2015) established that public debt leads to improvement of the public investment in Mexico. Similar results were established by Oke and Sulaiman (2012), Ogunjimi (2019). However, Ogunjimi finds that domestic debts crowds out both public and private investments in the long-run. In Kenya, there is limited evidence on the link between public debt and public investment. Most authors have focused on how domestic debts affect private investment. The current study employed Autoregressive Distributed Lag (ARDL) model to investigate both the short-term and long-term effects of public debt on public investment. In addition, the

study captured the effect of public debt on public investment before and during trade liberalization by introducing a dummy variable.

2. Methodology

This study adopted an investment theory developed by Keynesian and expounded on by other authors. In a model which dates back to 1930s after the great depression, Keynes argued that for countries to revive their economies and sustain economic growth, a country's Savings (S) was to be equal to Investment (I) (Asante, 2000). However, in the real life, the equality between savings and investments is not feasible. For instance, when a country uses part of her savings to service debts, there is no way, savings will equal investment. As an improvement, neoclassicals proposed flexible accelerator model which was later favored by Keynesian. The model argues that high investment rates are realized when there is a big gap between existing stock of capital, and the desired level of capital (Kilindo, 2016). Thus, the aim of the firm is to fill a fraction (δ) of the gap between capital of the previous year (existing) denoted by K_{-1}, and the preferred stock of capital, K^*. Therefore, the net investment function (I) is of the form:

$$I = \delta(K^* - K_{-1})\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots 1$$

Within this framework (equation 1), the determinants of K^* such as the output, internal funds, cost of external finances as well as other variables can be included. This provides the basis for including public debt in the current study. Therefore, the investment model of the study is expressed as:

$$I = \delta(PD, DS - K_{-1})\dots\dots\dots\dots\dots\dots\dots\dots 2$$

Where PD=public debt, DS=debt service. PD was decomposed into Domestic Debt (DB), and External Debt (ED). Hence, the estimated model was expressed as:

$$pubinv_t = \beta_0 + \beta_1 db_t + \beta_2 ed_t + \beta_3 ds_t + \beta_4 dummy_t + \varepsilon_t \dots\dots\dots\dots 3$$

Where, $pubinv$ is the public investment measured by real public investment as a percentage of GDP, db is the domestic debt (% of GDP), ed, is external debt (% of GDP), ds(% of GDP), $dummy$ is a dummy variable to capture the effect of trade liberalization (from 1990 to date) on public investment. The variable took 1 for periods beginning 1990-2019 and 0, otherwise. Subscript, t, represents time while ε_t is the error term.

The study employed time series data covering the period 1980 to 2019. This data was obtained from the Central Bank of Kenya, World Development Indicators (World Bank), and Kenya National Bureau of Statistics.

3. Empirical Results

The study sought to investigate the effect of Kenya's public debt on public investment. The study employed ARDL using data from 1980-2019. The results are presented into two sections. Section one analyses descriptive statistics while section 2 presents econometric findings.

3.1 Descriptive statistics

Descriptive findings are presented in Table 1. According to the results, public investment (pubinv) to GDP ranged between a minimum of 10.01 and a maximum of 21.39 with standard deviation of 2.2198. Coefficient of variation for public investment (0.1232) indicates that there is low level of dispersion around the mean.

Table 1: Summary Statistics

Variables	pubinv	pd	ed	db	ds
Mean	18.0105	504.5796	271.5144	233.0652	.7132
Std. Deviation	2.2198	556.6747	223.3827	395.6906	.4184
Min	10.01	17.1524	10.0084	7.144	.3583
Max	21.39	5423.728	3084.818	2060.579	2.7807
Kurtosis	0.0060	0.0087	0.8068	0.0000	0.0000
Skewness	0.0035	0.0003	0.1083	0.0000	0.0000
Coef of variation	0.1232	1.1032	0.8227	1.6977	.06161

Source: Author's computation using Stata 14

During the period under study, the mean public debt (PD) was Kshs. 504.5796 billion with a standard deviation of 556.6747 and a maximum of Kshs. 5423.728 billion. The coefficient of variation (1.1032) shows a greater dispersion of PD around the mean. From these statistics, it can observed that Kenya borrows more externally (mean Kshs. 271.5144 billion) than internally (Kshs. 233.0652 billion). This could be informed by the argument that higher level of domestic debt can crowd out private investment. Debt service (ds) ranged between minimum of Kshs. 0.3583 billion to a maximum of Kshs2.7807 billion with a mean of Kshs. 0.7132 billion. Generally, these findings imply that Kenya's public debt is on the increase, and hence, the country's debt serving obligations are on the increase. With regard to normality, the results show that all variables except external debt are normally distributed given the probability values.

Correlation statistics (Table 2) show that public investment is negatively correlated to debt service but, positively correlated to domestic and external debts.

Table 2: Correlation Analysis

	pubinv	ds	db	ed
pubinv	1.0000			
ds	-0.4502	1.0000		
db	0.1284	-0.1996	1.0000	
ed	0.2408	-0.3516	0.5850	1.0000

Source: Author's computation using Stata 14

3.2 Econometric Findings

Before estimation of the regression equation, the study undertook unit root test to ascertain stationarity status of variables. This was to guard against occurrence of spurious regression. The study adopted Augmented Dicky Fuller (ADF) and Philip-Perron (PP) unit root tests. On one hand, the results of ADF indicate that public investment and domestic debt variables are stationary at level while on the other hand, debt service and external debt were found stationary at first difference (see Table 3).PP test generated similar findings. These results means that two variables contain unit roots and trends with time.

Table 3: Unit root test

Series	Order	Exogenous	ADF Test t-statistic (p value)	PP Test t-statistic (p value)
pubinv	Level	Constant	-3.843 (0.0025)**	-3.885 (0.0021)**
		Constant & trend	-3.891 (0.0125)**	-3.918 (0.0115)**
ds	Level	Constant	2.679 (0.9991)	3.472 (1.0000)
		Constant & trend	2.237 (1.0000)	3.417 (1.0000)
	First Difference	Constant	-3.122 (0.0250)**	-3.228 (0.0184)**
		Constant & trend	-3.584 (0.0312**)	-3.636 (0.0269)**
db	Level	Constant	-4.036 (0.0012)**	-4.107 (0.0009)**
		Constant & trend	-5.286 (0.0001)**	-5.274 (0.0001)**
ed	Level	Constant	1.199 (0.9960)	1.549 (0.9977)
		Constant & trend	-1.533 (0.8177)	-1.592 (0.7955)
	First Difference	Constant	-5.622 (0.0000)***	-5.622 (0.0000)***
		Constant & trend	-6.060 (0.000)***	-6.089 (0.0000)***

Source: Author's computation using Stata 14

Note: *** and ** represent 1% and 5% levels of significance respectively

Having established that the variables of interest obtain stationarity characteristics at different levels, the study tested for cointegration to establish existence of long-run relationships in the series.

3.2.1 ARDL Bounds Test to Cointegration
ARDL bounds test forcointegration was adopted since variables are stationary at level me I(0) and me I(1). Null hypothesis of this test is that there is cointegration in the series. To interpret the results, a comparison is made between critical values and computed F-statistic. The hypothesis is accepted if the computed F-statistic is greater than critical upper bound at all levels of significance,and rejected otherwise. The results of the test in Table 4 show that computed F-statistic (11.12) is greater that upper bound critical values at all levels of significance. The results imply that, there is long run relationship in the model for public investment. Therefore, the study assumed that there was at least a long-run or a short run relationship in the model.

Table 4: ARDL Bounds Cointegration Test

Level of Significance	Critical value		F-statistic
	Lower bound	Upper bound	
1%	3.41	4.68	
5%	2.62	3.79	11.12
2.5%	2.96	4.18	
10%	2.26	3.35	

Source: Author's computation using Stata 14

3.2.2 Estimated Results of ARDL Short and Long-run models
After establishing the status of cointegration, the study implemented ARDL to estimate short and long rum models.

Findings of the short run and long run estimations are presented in Tables 5 and 6 respectively. Beginning with the short run findings, the error correction term (ECT) is negative and statistically significant as it was expected before (points at the existence of long-run relationship in the model). An ECT value of -1.2399 imply that a shock in the public investment in the present time will be restored at a speed of adjustment of approximately 123.99% in the following period. To express it differently, the public investment disequilibrium in the short-run due to shocks will converge towards long-run at a speed of 123.99% or less than a year.

Turning to the coefficients, the lagged variable for public investment is positive and statistically significant. The size of its coefficient (.3495027) imply that about 34.95% of the previous public investment explains the current public investment with the remaining percentage being explained by the other explanatory variables in the study.

In addition, findings show that in the short run, domestic debt affects public investment negatively but, the situation improves in the long-run. This disparity can be attributed to the utilization of borrowed funds as argued by (Egbetunde, 2012). Probably, the government uses domestic funds in the short-run to take care of recurrent spending as opposed to public investment. However, in the long run, domestic loans are invested in public projects.

With regard to external debt, the study has established too, contradicting results in the two models. In the short-run, external debts have a direct effect on public investment but, this worsens in the long run. This means that debt repayment burden is likely to reduce the level of public investment in the long run. Sánchez-Juárez and García-Almada (2015) too argued that public debt could improve the level of economic activities in the short-run but, such debts must be reasonable.

Concerning debt service, the study reports negative and positive relationship in the short-run and long-run respectively. However, these results are only significant in the short-run. This imply that repayment of public debts is likely to reduce government spending on public projects in the short-run. The results are consistent Clements *et al.,* (2005) who argued that debt service takes away resources and hence, reduced public investment.

With regard to inflation, the study has established that the rate of inflation has an adverse effect to public investment in the short run but, in the long-run, there is a healthy relationship between inflation and public investment. This imply that inflation shocks are short-lived but, they have to be addressed because of ripple effect. Finally, the dummy variable for trade liberation indicates a positive effect in the short-run which worsens in the long-run.

Regarding model characteristics, Adjusted R-squared value (Table 6) show that about explanatory variables explain public investment by about 89.06%. In addition, the Durbin Watson, VIF, and heteroscedasticity results of diagnostic tests show that the model was devoid of serial correlation, heteroscedasticity, had normal distribution with correct specification. Furthermore, plots of CUSUM (Figure 1) statistics of the estimated equation are within the critical bounds of 5% level of significance. This means that the

model passed the test for stability. Thus, findings of the study qualify to be adopted in policy formulation. The next section presents conclusions and policy recommendations.

Table 5: Estimated short-run Coefficients

Variable	Coef	Std. Deviation	t-statistic	P-value
Pubinv(lag)	.3495027	.1002521	3.49	0.005
ds	-1.114754	.1979264	-5.63	0.000
db	-.1413814	.0744472	-1.90	0.084
ed	.2650676	.0432293	6.13	0.000
inf	-.0664902	.0102033	-6.52	0.000
dummy	1.012604	.2302419	4.40	0.001
ECT	-1.239973	.1744285	-7.11	0.000

Source: Author's computation using Stata 14

Table 6: Estimated Long-run Coefficients

Variable	Coef	Std. Deviation	t-statistic	P-value
ds	.0111854	.1007804	0.11	0.914
db	.5501215	.0454462	12.10	0.000
ed	-.2509473	.0464393	-5.40	0.000
inf	.0328546	.0058733	5.59	0.000
dummy	-1.123807	.0962638	-11.67	0.000
_cons	1.444756	.3209287	4.50	0.001
Obs	39			
Adjusted R^2	0.8906			
F-Stat	31.083865			
Durbin-Watson	2.03143			
Mean VIF	1.48			
Heteroscedasticity Test(white test)	29.59(0.2420)			

Source: Author's computation using Stata 14
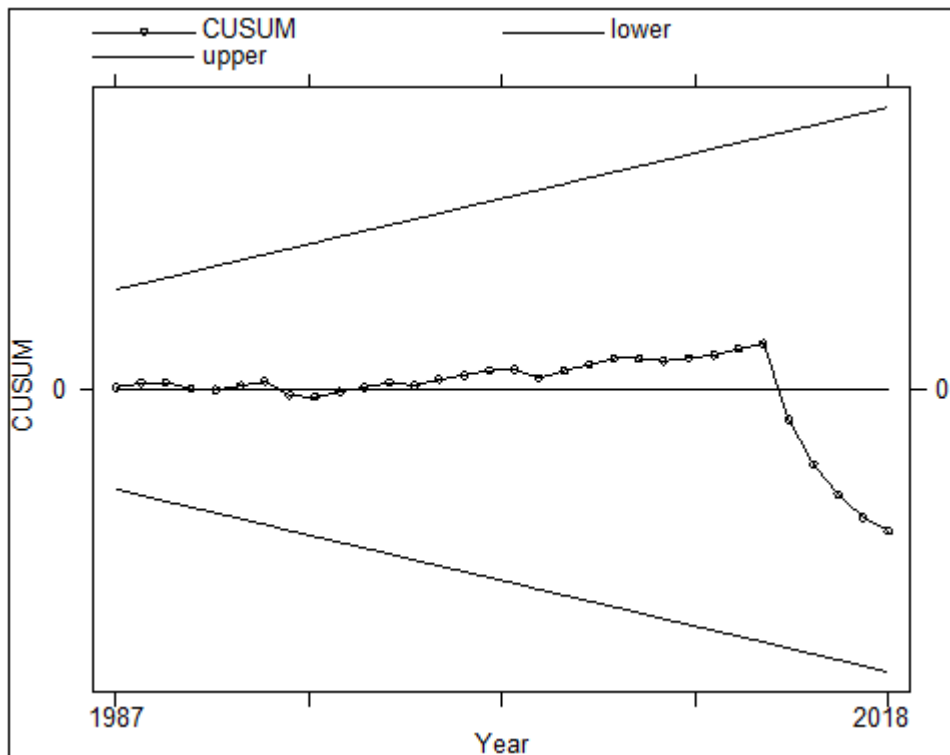Probability value (s) in parenthesis

Figure 1: Public Investment Model Plot of CUSUM
Source: Author's computation using Stata 14

3.3 Conclusion and Recommendations

The study sought to examine the effect of public debt on Kenya's public investment. ARDL model was applied using time series data covering 40 years (1980-2019). ARDL bounds test for cointegration confirmed existence of long-run relationship in the model. Therefore, the study implemented Error Correction Model (ECM) to estimate results. Various post estimation tests such as tests for stability, normality and serial correlation were conducted to ensure validity of the results.

Based on the findings, the study makes several conclusions. Firstly, domestic debt has adverse effect on public investment in the short-run. This could be attributed to the reasons for borrowing. Probably, the government borrows in the short-run to finance recurrent spending, and smoothening consumption and not investment in public projects.

Secondly, the study concludes that external debts affect public investment positively only in the short-run but, in the long-run the results are negative. The study attributes this to debt serving burden which deprived the economy of financial resources for public investment.

Thirdly, the study finds that both debt service and inflation have adverse effects on public investment in the short-run but, positive in the long run. However, the coefficient for debt service was not significant in the long-run. Inflation could reduce the value of a currency in the short-run but, with time, the government comes up with the right measures to counter the effect in the long terms.

Given the results, Kenyan government should take appropriate measures to mitigate the effects of public debt on public investment. For instance, the country should reconsider restructuring some of its current external debts to

restore cash flow. In addition, Kenya should focus more on concessionary as opposed to its current appetite for commercial loans. This can provide additional resources for public investment. Enhancing investment climate by reducing costs of energy and corporate tax rates could promote small and microenterprises development and hence, healthy economic growth.

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