Does Public Debt affect Private Investment in Kenya? ARDL Approach

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Abstract:- **Private sector investment plays a critical role towards economic growth and development. Private sector provides employment opportunities to almost 80 percent of Kenyan, pays revenue to the government in form of taxes and fees, and accounts for 50 percent of the GDP. Since 2013, Kenya's appetite for public debt has growth rapidly and this has elicited public debate on the effect of such debts on private investment. However, literature on this issue remains scanty and inconclusive. The study adopts Autoregressive Distributed Lag Model to respond to the question, "How does Kenya's public debt affect private investment? The study employed time series data covering 1980-2019. The finds that domestic debt has negative effect on private investment only in the short-run. Similar findings are observed with inflation. In addition, external debt crowds out private investment in the long-run and finally, debt service has adverse effect on private investment in both short and long-run. The study recommends better debt management practices as a remedy to the negative effects.**

Key Words: **Public Debt, Private investment, ARDL, GDP, External debt, Domestic debt.**

I. INTRODUCTION

Sustainable economic growth remains a key agenda of any country across the world. Welfare of citizens is hinged on the performance of the economy. Saunweme & Mufandaedza (2013) opines that sound macroeconomic policies focusing on private and public investment is the key to unlocking the untapped potential of an economy towards movement towards the steady stead. Low levels of capital formation due to insufficient savings in developing countries like Kenya has become a threat to both public and private investments. As a result, Kenyan government resorted to borrowing both internally and externally to finance budgetary deficits which are now a common phenomenon. However, the surge in the Kenya's debt stock for the last ten years has become a course for worry among many Kenyans especially, its implications on both private and public investments. As at March 2020, Kenya's public debt stood at Kshs. 6.28 trillion with 0.7 ratio to GDP. This imply that the country has a huge debt servicing obligation that is likely to compromise both public and private investments, and hence, economic growth.

The achievement of Kenya's Vision 2030 is highly depended on both public and private investment. In fact, the drafters of the Vision advocated for more than 32 percent investment (at least 9 percent of public investment and 24 percent private investment) to GDP (Republic of Kenya, 2012). However, the level of investment to GDP in Kenya has largely remained below 30 percent. For instance private investment to GDP ratio at the end of 2018 was 18.5 percent while public investment stood at 7.04percent (KNBS, 2019). Several factors have been attributed to this dismal performance such as economic uncertainty, challenges in the financial markets, and poor macroeconomic environment which led to debt crisis (Njuru, Ombuki, Wawire, and Okeri, 2013). In addition, low private investment is partially attributed to low levels of saving in the country.

The link between public debts and private investment is a critical issue regarding economic growth and developing from both theoretical and empirical point of view. For instance, evidence indicate that most developing countries opt for external borrowing for fear that domestic loans could lead to crowding out effect (Otieno, 2015). The argument is that, high demand for domestic debt exerts upward pressure on interest rates which ultimately increases the cost of credit to private investors and this pushes them out of the business. In addition, it is argued that external debts have low interest rates, long maturity periods, and are also sources of foreign exchange to shield local currencies from volatility. Furthermore, high interest rates attracts foreign investors which then increases the demand for domestic currency. This results into appreciation of the local currency leading to cheaper imports and more expensive exports, and hence trade deficit, an impediment to economic growth (El-Mahdy and Torayeh, 2009). Domestic borrowing takes savings from private entities which would have been utilized for investment and therefore, if such borrowed funds are not invested in productive sectors, the economy is disadvantaged since private investments are curtailed.

Empirical studies indicate that external borrowing could have negative implications on both public and private investment (Yeap, 2012; Kasidi & Makame, 2013 Saungweme & Mufandaedza, 2013). These studies argue that high levels of debt service arising from huge external debts deprive the economy of resources which will have been invested in the productive sectors and thereby, affecting investment negatively. Similarly, Akomolafe et. al. (2015), Fayed (2012), Okorie (2013) argue that domestic debt has a negative effect on domestic investment in the long-run. However, Salyungu and Felician (2019) reported no significant relationship between public debt and private investment. The recent studies in the Kenyan context report negative relationship between domestic borrowing and private investment in the short run (King'wara, 2014, Kamundia et al, 2015, Lidiema,

2018). However, in the long-run, the coefficient for domestic debt turned positive for the case of Lidiema.

From the empirical literature, it is clear that most studies have focused on the effect of domestic debt on private investment and hence, little attention has been given on how external debt affect private investment. It should be noted that investment of external debts into development projects stimulates aggregate demand which could in turn influence private investments. The current study addressed this issue by separately investigating the effect of domestic and external debts on private investments. In addition, there was also methodological challenges in the previous study for Kenya which could have led to inconsistencies in the results. For instance, King'wara, (2014) and Kamundia et al (2015) used and OLS estimation which fails to account for selection bias, and endogeneity. In addition, with OLS, it is not possible to determine short or long-tern effects of one variable against another. Furthermore, though Lidiema (2018) employs an appropriate model, his results could be out of touch with reality since the data used covers the period 1975-2006 during which Kenya's public debt was very minimal. The surge in Kenya's debt has occurred in the period between 2008 to date for which the current study captures. Moreover, the study introduces a dummy variable to capture the effect of trade liberalization on private investment.

II. METHODOLOGY

The study adopted a Keynesian approach on investment which dates back to 1930s and upon which several theoretical models have emerged (Asante, 2000). The key pillar of Keynes approach is that savings (S) should be equal to investment (I). However, in the real life, some factors can explain the inequality between these two factors, meaning that savings may not always equal to investment. For instance, when a country uses part of her savings to service debts or even for donation, Savings will not be equal to investment($S \neq I$).With this in mind, the neo classicals proposed flexible accelerator model which is also now favored by Keynesian. Basic principle behind this framework is that the wider the gap between existing stocks of capital, and the preferred capital, then, the higher the rate of investment (Kilindo, 2016). The objective 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 desired stock of capital, K^*. Thus, the net investment function (I) can be expressed as:

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

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

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

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

$$privv_t = \beta_0 + \beta_1 db_t + \beta_2 ed_t + \beta_3 ds_t + \beta_4 dummy_t + \varepsilon_t \quad 3$$

Where, $privv$ is the private investment measured by real private 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 private 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.

III. FINDINGS

3. 1 Descriptive

The summary statistics of the study includes mean, standard deviation, minimum and maximum values of all variables of interest. In addition, Kurtosis and Skewness measures as wells as coefficient of variation are estimated. These statistics are presented in Table 1. According to the results, the mean of private investment (prinv) to GDP during the study was 10.1461 and it ranged between a minimum of 7.47 and a maximum of 17.54. The coefficient of variation (0.2217) shows that there is less dispersion of the distribution from the mean. During the same period, public debt (PD) ranged between a minimum of Kshs.17.1524 billion and a maximum of Kshs. 5423.728 billion. As regard the coefficient of variation, there is large dispersion around the mean given a higher coefficient value (1.1032).

The findings report more external debts than domestic debts (db) as evidenced by the means: Kshs. 271.5144 billion and Kshs. 233.0652 billion respectively. This imply that the country favors external borrowing than external probably because of the likely adverse effect of domestic borrowing to private investment. The mean of Kenya's debt servicing (ds) stands at Kshs. 0.7132 billion with standard deviation of Kshs. 0.4184 billion and ranges between minimum of Kshs. 0.3583billion to a maximum of Kshs2.7807 billion. Generally, the study reports increasing debt servicing obligation for Kenya plausibly due to the upward trend in the public borrowing. Apart from external debt, the probability values of Kurtosis and Skewness for all variables indicate normality in the distribution.

Table 1: Descriptive Statistics

Variables	Prinv	Pd	ed	db	ds
Mean	10.1461	504.5796	271.5144	233.0652	.7132
Std. Deviation	2.2500	556.6747	223.3827	395.6906	.4184

Min	7.47	17.1524	10.0084	7.144	.3583
Max	17.54	5423.728	3084.818	2060.579	2.7807
Kurtosis	0.0081	0.0087	0.8068	0.0000	0.0000
Skewness	0.0004	0.0003	0.1083	0.0000	0.0000
Coef of variation	0.2217	1.1032	0.8227	1.6977	.06161

Source: Author's computation using Stata 14

Turning to correlation analysis, Table 2 indicates that private investment is negatively correlated with both domestic debt and external debt. Nevertheless, statistics indicate that debt service is positively correlated to private investment.

Table 2: Correlation Analysis

	Prinv	Ds	db	ed
prinv	1.0000			
ds	0.2318	1.0000		
db	-0.3124	-0.1996	1.0000	
ed	-0.2735	-0.3516	0.5850	1.0000

Source: Author's computation using Stata 14

3.2 Econometric Analysis

The study implemented time series methods in the estimation of private investment model. Before the actual regression, unit root test was undertaken on all variables of interest to establish their stationarity status. This was actualized with the help of Augmented Dicky Fuller (ADF), and Philip Perron (PP) tests. The test is done to ensure that no variable with a unit root enters a regression analysis since this could lead to spurious regressions. According to the results (see Table 3), private investment and domestic debt were found stationary at level under both ADF and PP tests. In addition, both debt service and external debt variables are stationary at first differencing for all the tests. The implication of these revelation is that two variables have unit roots and trends with time.

Table 3: Unit root test Results

Series	Order	Exogenous	ADF Test t-statistic (p value)	PP Test t-statistic (p value)
prinv	Level	Constant	-3.558 (0.0066)**	-3.556 (0.0067)**
		Constant & trend	-3.825 (0.0153)**	-3.762 (0.0186)**
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 (0.0000)***	-6.089 (0.0000)***

Source: Author's computation using Stata 14

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

3.3 ARDL Bounds Test to Cointegration

The implementation of ARDL bound test for cointegration was informed by the fact that stationarity of variables was achieved at different levels of cointegration, that is I(0), and I(1) as indicated in Table 3. The null hypothesis of the test is that there is cointegration in the system. This hypothesis is rejected when computed F-statistics is less than the upper bound of critical values at all levels of significance and accepted otherwise. The results are termed inconclusive if F-statistic value falls between the lower and upper bound critical values. Findings of the test (see Table 4), reveal that F-statistic is greater than all the upper bound values at all levels of significance. Therefore, the study concludes that there is cointegration in the model. The study makes an assumption of the existence of both long-run and short-run relationships in the private investment model.

Table 4: ARDL Bounds Cointegration Test

Level of Significance	Critical value		F-statistic
	Lower bound	Upper bound	
1%	3.41	4.68	7.666
5%	2.62	3.79	
2.5%	2.96	4.18	
10%	2.26	3.35	

Source: Author's computation using Stata 14

3.4 Results for ARDL Short and Long-run models

ARDL bound test for cointegration has confirmed existence of long run and possible short run relationships in the private investment model. Thus, the study estimated short and long run models with the aid of ARDL model (Tables 5 and 6). The error correction term (ECT) coefficient, -1.533524 and which is significant too, imply the existence of long run relationship in the estimated results. In addition, this term mean that shocks in private investment in the current time will be restored at an adjustment speed of about 153.35% or less than a year. To put it differently, it will take less than one year for disequilibrium in the private investment to converge to long-run. The lagged variable for private investment of 0 .8884978 means that previous private investment as a percentage of GDP explain the current private investment by about 88.5%. The remaining percentage can be attributed to other explanatory variables in the equation.

The study reveal that Kenya's debt service has negative effect on private investment in both short and long run. These results are also statistically significant at 5% level. However, the size off coefficients indicate that debt service has a greater impact in the short run (-1.240222) relative to long-run(-0.289929). Higher debt servicing is likely to reduce government expenditure which stimulates effective demand and therefore, low private investment in both short and long-run.

With regard to domestic debt, findings reveal crowding out effect only in the short-run (-0.2609868). However, this variable is significant at 10%. In the long run, domestic debt leads to an improvement of private investment. These results imply that Kenya has sustainable domestic debt which is unlikely to harm private investment. Lidiema (2018) reported similar results. In addition, Yeap (2012), Kasidi and Makame (2013), Saungweme and Mufandaedza (2013), King'wara (2014) and Kamundia et al (2015) found a negative relationship between domestic debt and private investment. However, these findings were limited on short-run model.

According to the findings, external debt has a direct effect (.2793416) on private investment in Kenya but, this effect worsens in the long run (-.1719436). When government borrows, it spends on public projects and this could stimulate effective demand which could lead to enhanced private investment. However, in the long-run, debt serving is likely to constrain government expenditure which could choke private investment through inefficient demand. On inflation, the study reports contradicting results concerning inflation in the two models. In the short run, inflation is negatively related to private investment. However, a positive effect is observed in the long run.

Concerning the dummy variable for trade liberalization, the short-term model reports positive effects while negative relationship is recorded in the long run. This imply that private investors are disadvantaged in the long run as a result of trade liberalization. This can be attributed to high export tariffs, local taxes, and higher level of competition at the international markets.

Adjusted R-squared value (Table 6) imply that explanatory variables explain public investment by about 79.48%. 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.

Table 5: Estimated short-run Coefficients

Variable	Coef	Std. Deviation	t-statistic	P-value
Prinv (lag)	.8884978	.2475513	3.59	0.007
ds	-1.240222	.309819	-4.00	0.004
db	-.2609868	.1146948	-2.28	0.052
ed	.2793416	.0524512	5.33	0.001
inf	-.0875717	.015141	-5.78	0.000
dummy	1.413624	.390668	3.62	0.007
ECT	-1.533524	.2666272	-5.75	0.000

*Source:*Author's computation using Stata 14

Table 6: Estimated Long-run Coefficients

Variable	Coef	Std. Deviation	t-statistic	P-value
ds	-.289929	.1069491	-2.71	0.027
db	.4780513	.0428216	11.16	0.000
ed	-.1719436	.0466462	-3.69	0.006
inf	.0327082	.0067069	4.88	0.001
dummy	-1.099979	.1032279	-10.66	0.000
_cons	2.079223	.4898224	4.24	0.003
Obs	39			
Adjusted R^2	0.7948			
F-Stat	44.7221			
Durbin-Watson	2.006			
Mean VIF	1.36			
Heteroscedasticity Test(white test)	29.59(0.2420)			

Source: Author's computation using Stata 14

*Probability value (s) in parenthesis

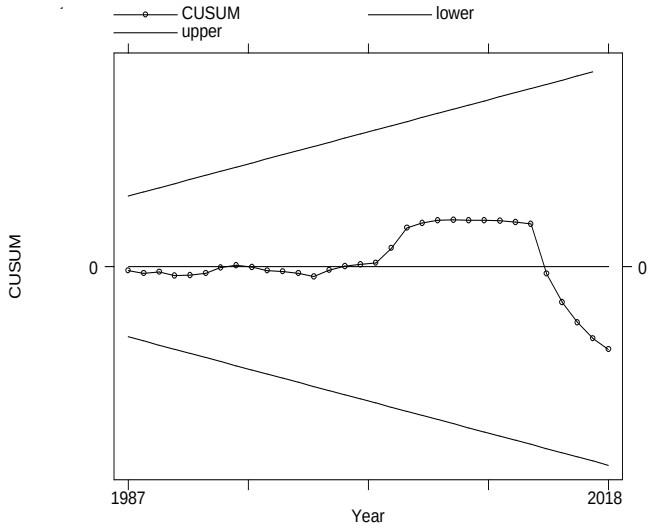

Figure 1: Private Investment Model Plot of CUSUM

Source: Author's computation using Stata 14

IV. CONCLUSION AND RECOMMENDATIONS

The aim of this study was to establish the effect of Kenya's ballooning public debt on private investment. Departing from previous studies where only the effect of domestic debt on private investment had been looked at, the current study included both external debt, and external debt service in the

analysis. The ARDL model was adopted using data from 1980-2019. ARDL bounds test for cointegration confirmed existence of long-run relationship in the series. This led to the implementation of Error Correction Model (ECM) which similarly showed that there was long-run linkages within the model.

The study concludes that domestic debt has adverse effect on Kenya's private investment in the short-run but, in the long-run, positive results are reported. Domestic borrowing rises the level of interest in the economy and hence, crowding out private investment. However, with the right macroeconomic policies, it appears that such adverse effects disappears in the long-run. In addition, the study concludes that debt service has a negative effect on private investment in both short and long-run periods. Currently, Kenya has a huge external debt burden and therefore, servicing of this debt takes away resources that could have been investment in public projects to stimulate demand. Hence, leads to reduced cash flow in the hands of the public, less demand and ultimately a decline in private investment.

Thirdly, the study concludes that external debt stock has a positive effect on private investment only in the short run. In the long-run, the debt service obligation takes resources away from the economy, and this could affect aggregate demand in the economy due to limited government expenditure with the final result being choked private investment. Finally, inflation is a major problem on private investment only in the short run.

From these results, it is clear that Kenya's public debt, domestic and external as well adversely affect private investment. The government should therefore employee the best debt management strategies to mitigate these effects. First, the government needs to ensure that borrowed funds are spend on productive activities. Secondly, the government should re-negotiate with its debtors for better terms such as long repayment period and low interest rate. Thirdly, concessionary and not the current commercial loans should be embraced by the Kenyan government.

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