Effects of Government Borrowing on Private Investments in Kenya

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Abstract

This paper analyses the effect of government domestic borrowing on private investment using an Auto Regressive Distributed Lag (ARDL) model to test for long-run and short-run co-integration relationship between the independent variables and Gross fixed capital formation. The findings show that Domestic Debt has a negative and significant relationship with Gross fixed capital formation even though this relationship diminishes in the long run. The findings confirm that excessive domestic borrowing by the government can negatively affect investment and eventually hurt economic growth. The paper recommends the need for the government to come up with policies to govern domestic borrowing and interest rates in addition to policies that encourage financial development through boosting Small and Micro enterprises lending to encourage local investment.

Key words: *Government Borrowing, Gross Domestic Savings, real interest rate. Domestic Private Investment, ARDL*

1.0 Introduction

Public debt usually arises when government revenues fall short of public expenditure. This causes the government to borrow either domestically, externally or both in order to finance the deficit.

Domestic Public Debt is defined as debt owed to holders of Government securities such as Treasury Bills and Treasury Bonds. In Kenya, Central Bank of Kenya issues domestic debt on behalf of the Government by floating Treasury bills and Treasury bonds. In addition to treasury bills and bonds domestic public debts also comprises of market stabilization schemes, ways and means advance and securities against small savings. Government domestic debt is used for various reasons including; finance the budget deficit when the government is not able to meet its expenditure commitments using domestically raised revenue and externally sourced grants and borrowing; Helps in implementation of monetary policy through open market operations in addition to development of financial markets through debt instruments. Moreover, the purpose of borrowing is also to influence aggregate demand for maintaining stability in the economy.

The relationship between Government borrowing and private investment is a perennial issue in economic growth and development judging from several theoretical and empirical scholarly works on issue about if Government borrowing leads to crowding out or crowding in of the private sector credit. According to KENDREN (2009), appropriate use of debt could lead to improved socio-economic growth and thus, better standards of living. To make debt effective there is need for far reaching reforms in the management of the public sector. However, in most cases resources from debt have not been used effectively, largely due to lack of adequate or realistic planning and failure to generate sufficient resources to service the debt. Therefore socio-economic development

is compromised since the government spends huge sums on loan repayments, hence reducing money it spends on the provision of social services such as education, health among others, which mainly target the poor, who comprise the majority of the population.

Whittaker (2008), asserts that the public debts are incurred with an objective of "helping alleviate poverty by expressing faith in the work ethic and entrepreneurial capabilities of the world's poorest people". However, Sometimes this domestic debt is used to finance recurrent expenditure rather than production and investment. Amadi (2012), confirms that financial discipline has been eroded on the backdrop of availability of easy credit. Similar sentiments are echoed by research studies by Akomolafe et. al. (2012) who asserts that the importance of economic growth in the life of a country cannot be overemphasized. It is the means of reducing poverty and raising peoples' incomes. One of the most important determinants of the rate of growth in an economy is the rate on investment. Countries with high rate of investments experience high rate of growth, while countries with low investment rate are slow in their growth process. These however can only be achieved if the debt is used effectively and efficiently in viable projects that generate more revenues and improve the economy of the country.

While scholars in developed world have developed a fairly sizeable literature on public debt and its effects on private investments, in developing countries most of these studies have combined macro-economic factors and domestic debt as independent variables. In addition, despite the fact that, previous empirical studies have provided the nexus between Government borrowing and crowding out effect, prior studies conducted in the area of crowding out effect in Africa remain scanty and with minimal attempt to analyse the effects of domestic debt and financial development on investments. This study, therefore, seeks to examine the effect of Government borrowing on the economy via private investments and to establish if Financial development plays a role in private investments.

The study is guided by two research questions:

• What is the effect Government borrowing on Private Investments?

• How does Financial Development affect Private Investments?

The rest of the study is structured as follows: Section 2 highlights the comprehensive overview of the theoretical and empirical literature whereas Section 3 presents the methodology and data issues. Section 4 reports the results of the empirical analysis and section 5 concludes the study providing the policy implications and recommendation to the industry players and the Government of Kenya.

2.0 Review of the Literature

2.1. Theoretical Review

Theory of Functional Finance by Abba Lerner (1943) argues that the government should borrow money only if it is desirable that the public should have less money and more government bonds. The theory stresses that this might be desirable if otherwise the rate of interest would be reduced too low and induce too much investment, thus bringing about inflation.

According to Lerner, government should only borrow money when it wishes to raise interest rates and by lending money or repay debt when it wishes to lower the rate of interest. The theory further states that the government shall maintain that rate of interest that induces the optimum level of investment. Proponents of this theory believe that the absolute value size of public debt does not matter at all.

The modern theory of public debt is a countercheck of Keynesian theory of economics. The modern theory of public debt which is concerned with macro-economic variables assumes the whole economy as a single unit. The proponents of this theory believe that domestic public debt does not bring any burden residents since it belongs to them and resources remain within the country but only changes through transfer from tax payers to bond holders. Modern theory of public debt believes that more income facilitates payment of taxes and interests of the debt. This theory further assumes that increased public borrowing leads to development in the banking industry, stock market and capital markets and insurance companies. The theory is supported by Buchana (1999).

2.2. Empirical review

The studies by of Akomolafe et. al. (2015), Hashibul Hassan (2015), analyzed Impact of Public Debt Burden on Economic Growth in

Nigeria and Bangladesh respectively. Their studies divided domestic debt and external debt effects to the economy. They applied Johansen co-integration test, Error Correction Model (ECM) and Vector Error Correction Model (VECM) to establish the association between each set of variables. The study revealed that a significant positive relationship exists between total public debt & investment and between total public debt Government's reserves. The empirical outcomes of their study also reveal that domestic debt has a negative relationship with domestic investment in both short-run and long-run. On the other hand a negative relationship of total public debt exists with manufacturing sector and Government subsidy. However, no strong statistical evidence has been found regarding the negative impact of domestic debt and external debt on the GDP growth rate. The studies concluded that both domestic debt and external debt crowd-out private investment in the short run, Government should strive to reduce her debt profile by improving its revenue base.

Kingw'ara (2014) examined the effects of public debt on private investments using GDP growth rate, interest rate, public debt and public interest as independent variables for 1967–2007 period. He found out that there exists a negative relationship between domestic public debt and private investment.

Ugochukwu et. al. (2013), also analysed relationship between capital formation and economic growth in Nigeria for the period 1982–2011, Linnea Nilsson (2014), in his thesis titled "Borrow more promotes

economic growth" examined relationship between household debt and economic growth. Seifallah Sassi (2012), analysed the effect of enterprise and household credit on economic growth from European Union countries over the period 1995–2012. The empirical assessment found that Inflation rate and interest rate has a negative impact on economic growth in Nigeria while enterprise credit market affects economic growth positively whereas household credit market has a negative effect in the European countries. The result further shows a long run relationship between economic growth and capital formation. Further, they conclude that GDP per capita growth rate positively affects household credit. They concluded that efforts should be directed at increasing the level of capital formation since it has the potential to drive the economy to the next level. This supports study by Bahar Bayraktar (2003) that economic growth and development depend essentially on a country's ability to invest and make efficient and productive use of its resources.

Fayed (2012), analysed the Crowding out Effect of Public Borrowing in Egypt. The study revealed a possible crowding out of private credit by Government borrowing from the domestic banking sector and its negative effects on private investment. She suggests that more credit bureaus need to be established in order to enhance the availability and dissemination of credit information. She further reiterated that Government should provide guarantees to banks so that they will not be reluctant to provide credit to the private sector particularly to small-scale enterprises and export

oriented enterprises. Investment banks should be more widely established to play a more active role as an alternative mean of financing, especially with the growing role of the private sector in the development process. This study supports Ghosh, Mookherjee & Ray (1999), that credit is essential in allowing capital investments among producers (such as farmers) who are not able to save, as well as giving households the ability to obtain money in an emergency.

Sheikh R.M et al (2010) carried out an empirical investigation on Domestic Debt and Economic Growth in Pakistan for 1972–2009 period. The study indicated that the stock of domestic debt affects the economic growth positively in Pakistan. In addition, the study observed an inverse relationship between domestic debt servicing and economic growth. This result is due to the fact that huge burden of non-development expenditures impedes the economic growth. The findings of study revealed that the negative impact of domestic debt servicing on economic growth is stronger than positive impact of domestic debt on economic growth.

Adelakun (2012) investigated the determinants of Savings and Investment in Nigeria using VECM and found out that there exist a significant short run relationship between investments as measured by gross capital formation (GCF) in Nigeria. The author further noted that low-level savings affected capital formation. This low-level savings has led to low investment, negative real GDP growth, a decline in per capita GNP and other unpleasant macroeconomic developments in the Nigerian economy. This supports the findings by Inuwa et al (2013) who reportd a long-run relationship between domestic savings and Investment.

Abbas and Christensen (2007) investigated the empirical role of Domestic Debt Markets in Economic Growth for Low-income Countries and Emerging Markets for the period of 1975-2004 by applying Granger Causality Regression model. The result showed that moderate levels of marketable domestic debt as a percentage of GDP have significant positive, non-linear impacts on economic growth, but debt levels exceeding thirty five percent of total bank deposits to have a negative effect on economic growth.

Okorie (2013) investigated the impact of private sector credit on private domestic investment in Nigeria using the error correction model technique. The study found out that increase in private sector credit (PSC) though not statistically significant leads to increase in private domestic investment (PDI) as typified by 10% increase in private sector credit which led to 6% increase in total domestic investment in Nigeria. However, the non-statistical significance of private sector credit showed that there is need for increase in private sector credit in the Nigerian economy.

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3.0 Methodology

3.1   Data

The paper employs the empirical model by Emran and Farazi, (2009). The only difference is whereas Emran and Farazi based their analysis is on a cross-country panel data set consisting of 60 developing countries and 32 years (annual data for 1975-2006). With regard to co-intergration analysis, ARDL approach by Pesaran et al (2001) was employed.

3.2   Model Specifications

Before estimating the model, the dependent and independent variables are separately subjected to some stationary tests using unit root test since the assumptions for the classical regression model require that both variables be stationary and that errors have a zero mean and finite variance. The unit root test is evaluated using the Augmented Dickey-Fuller (ADF) test which can be determined as:

$$\Delta y_t = \beta_1 + \beta_2 t + \delta y_{t-1} + \alpha_i \sum_{t=1}^{m} \Delta y_{t-1} + \varepsilon_t$$

Where ε_t is a pure white noise error

This study employs ARDL approach to co-integration following the methodology proposed by Pesaran et al (2001). This methodology is chosen as it has certain advantages on other co-integration procedures. For example, it can be applied regardless of the stationary properties of the variables in the sample. Secondly, it allows for inferences on long-run estimates which are not possible under alternative co-integration procedures. Finally, ARDL Model can accommodate greater number of variables in comparison to other Vector Autoregressive (VAR) models.

The following models are used to examine the relationship between equity market returns and macroeconomic factors;

$$GFCF=a_0+a_1DD+a_2FD+a_3GDS+a_4LR+a_5GDPC+\varepsilon_t \ ....\text{Model 1}$$

$$GFCF=a_0+a_1DD+a_2FD+a_3GDS+a_4LR+a_5GDPCR+a_6ED+ \ \varepsilon_t \ .... \text{Model 2}$$

Where GFCF is Gross Fixed Capital Formation- (proxied by the share of the gross domestic Capital formation to GDP less net FDI inflows); DD is Domestic Debt- total Government debt in a country that is owed to lenders within the country; GDPC is Gross Domestic Product per capita Growth Rate; LR is Lending Rate; FD is Financial development expressed proxied as domestic credit to private sector as a percentage of GDP.; ED is the external debt; and GDS is Gross Domestic savings expressed as proportion of GDP. The econometric **model 2** is nested in **model 3**

Finally, stability of short-run and long-run coefficients are examined by employing cumulative sum (CUSUM) and cumulative sum of squares (CUSUMSQ) tests.

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F O U R

4.0 Presentation and Interpretation of Results

The Results of the analysis are presented as follows; Descriptive statistics, Unit root tests, examination of long run and short run of the model using ARDL both short run and long run coefficients. First, Model 2 is ran to find out the effects of domestic debt alone on investments and secondly model 3 is also ran to examine the combined effects of domestic and external debt on investments in Kenya.

4.1 Descriptive Statistics

Table 1 presents the descriptive statistics of the variables. From the results, domestic debt is negatively skewed with the rest of the variables having a positive skew.

Table 1: Descriptive Statistics

	GFCF	DD	FD	GDS	LR	GDPCR	ED
Mean	18.84954	14.74714	23.21756	13.56662	17.57385	0.768563	51.44929
Median	18.95043	16.26318	23.29588	12.86345	15.02338	0.952103	47.06896
Maximum	25.07647	27.90000	34.80964	27.08909	36.24000	5.557505	123.6398
Minimum	15.38790	0.000000	17.30457	3.895554	10.00000	-3.952964	21.22587
Std. Dev.	2.079925	9.586413	4.567741	6.066617	6.821707	2.471571	23.58445
Skewness	0.418329	-0.063663	0.623772	0.175942	1.206407	0.030071	0.928991
Kurtosis	3.479426	1.309851	2.774949	1.876738	3.638765	2.031385	3.731544
Jarque–Bera	1.549743	4.788023	2.678358	2.309234	10.38282	1.569721	6.645422
Probability	0.460763	0.091263	0.262061	0.315178	0.005564	0.456183	0.036055
Sum	753.9815	589.8857	928.7026	542.6649	702.9539	30.74250	2057.972
Sum Sq. Dev.	168.7174	3584.073	813.7059	1435.350	1814.892	238.2379	21692.83
Observations	40	40	40	40	40	40	40

4.2 Results of the unit root/ Stationary testing

The Augmented Dickey Fuller (ADF) unit roots tests is employed to test for the time series properties of model variables with trend and intercept. The results conclude that all variables except Gross Domestic Savings (GDS) are stationary upon the first difference implying that they have one unit root. GDS is stationary at I(0). This combination of I(0) and I(1) justifies the use of ARDL.

Table 2: Unit Roots Test Result Variable

	Sig. L	Level	Critical values	1st difference	Critical values
GFCF	1%	–2.849815	–3.610453	–7.12215	–4.234972***
	5%		–2.938987		–3.540328**
	10%		–2.607932*		–3.202445*
DD	1%	–2.2229	–4.226815	–9.213667	–4.226815***
	5%		–3.536601		–3.536601**
	10%		–3.20032		–3.20032*
FD	1%	–2.461728	–4.211868	–5.83721	–4.226815***
	5%		–3.529758		–3.536601**
	10%		–3.196411		–3.20032*
GDS	1%	–4.076505	–4.211868		
	5%		–3.529758**		
	10%		–3.196411*		
LR	1%	–1.601904	–3.610453	–6.023360	–3.610453***
	5%		–2.938987		–2.938987**
	10%		–2.607932		–2.607932*
GDPCR	1%	–1.285888	–4.219126	–3.665205	–4.219126
	5%		–3.533083		–3.533083**
	10%		–3.196411		–3.198312*
ED	1%	–1.199438	–3.610453	–6.298426	–3.610453***
	5%		–2.938987		–2.938987**
	10%		–2.607932		–3.198312*

*** Sig 0.01,   ** Sig 0.05,   * Sig 0.1

4.3 ARDL Bound Testing for Integration

Pesaran et al (2001), gave three reasons for using ARDL Model namely ;the model can be estimated using OLS , the bound tests allows a mixture of I(1) and I(0) for variables. That is variables can be at level or first difference. The ARDL test model can be used for small sample data.

Table 3: ARDL Bound Test for Integration-Model 1

Test Statistic	Value	k
F-statistic	4.479879	6

Critical Value Bounds

Significance	I0 Bound	I1 Bound
10%	1.99	2.94
5%	2.27	3.28
2.5%	2.55	3.61
1%	2.88	3.99

From **Table 3** the *F-statistic* (of 4.48) is higher than the upper bound at 95% (of 3.28) or 90% (of 2.94). Hence the conclusion that, there is co-integration among the set of I(0) and I(1)) variables. Hence, the assumption that there can be at least long run or short run relation between domestic debt, financial development, gross development savings,Gross Domestic Product per Capita and Gross fixed capital formation.

From **table 4**, the ARDL result shows that there is an insignificant negative long-run relationship between Domestic debt and gross fixed domestic capital formation product suggesting that an increase in domestic debt negatively affects gross fixed capital formation in Kenya. Specifically, 10% change in domestic debt will result in 0.67%% decrease in gross fixed capital formation as a percentage of GDP. This is in contrary to the findings by Abbas and Christensen (2007) who reports a moderate domestic debt levels drive economic growth.

Table 4 : Estimated Long Run Coefficients – Model 1

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DD	-0.066562	0.053521	-1.243669	0.2287
FD	0.536680	0.164141	3.269627	0.0040
GDS	0.246037	0.126308	1.947904	0.0664
LR	0.162182	0.058480	2.773296	0.0121
GDPCR	1.012814	0.227821	4.445653	0.0003
STBR	-0.420014	0.918971	-0.457048	0.6528
C	1.644318	5.085789	0.323316	0.7500

The Estimated Model for Long term is

$$GFCF = -0.0666*DD + 0.5367*FD + 0.2460*GDS + 0.1622*LR + 1.0128*GDPCR - 0.4200*STBR + 1.6443 + \varepsilon_t$$

However, Financial Development (FD) proxied as Domestic credit to private sector Gross Domestic Savings (GDS) and Gross Domestic Product per Capita (GDPC) have positive and significant long run relationship with gross fixed Domestic capital formation in Kenya. This suggests that an increase in financial development proxied (increase in Domestic credit to private sector) in Kenya will lead to in capital formation in Kenya hence increased Investments. Gross domestic savings have a significant positive effect on Gross fixed capital formation in Kenya. This suggests that an increase in Gross Domestic Savings leads to increase in Gross fixed capital formation. Specifically 10% change in GDS leads to 2.46% increase in GFCF.

The results also indicate that GDP per Capita growth positively and significantly effect on Gross fixed capital formation and specifically 10% rise GDP per capita leads to 10.1% rise in Gross fixed capital formation.

Surprisingly, Lending rate a positive but insignificant long run relationship with Gross fixed capital formation. The findings agree with Munir et.al and Athukorala,(1998). If the rate of borrowing domestically to finance investment is increased this would boost savings for future lending. The private sector and individuals can also use earned interest for re-investment.

Table 5: Short-run estimation effects - Model 1

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(DD)	-0.024767	0.029614	-0.836316	0.4134
D(FD)	0.355972	0.100644	3.536939	0.0022
D(FD(-1))	-0.620362	0.114818	-5.403016	0.0000
D(GDS)	0.262131	0.051392	5.100619	0.0001
D(GDS(-1))	0.196009	0.048261	4.061467	0.0007
D(GDS(-2))	0.235439	0.051068	4.610291	0.0002
D(LR)	0.097310	0.050366	1.932044	0.0684
D(GDPCR)	0.385265	0.071723	5.371590	0.0000

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(GDPCR(-1))	-0.269511	0.090083	-2.991818	0.0075
D(STBR)	-0.325540	0.654918	-0.497070	0.6248
D(STBR(-1))	-2.232967	0.659944	-3.383569	0.0031
D(STBR(-2))	-0.927260	0.589758	-1.572270	0.1324
CointEq(-1)	-0.667982	0.098089	-6.809995	0.0000

Prob(F-statistic) 0.000034   *Wald F-statistic* 19.73596   *Prob(Wald F-statistic)* 0.0000

From **table 5**, results indicate presence of short run relationships between variables and GFCF. The cointergration term is coefficients negative (-0.668) as required and significant at 5% level implying that the deviation from the long-term gross fixed capital formation is corrected by around 66% (adjustment process speed to equilibrium). Thus that the adjustment takes place relatively quickly.

The cointegrating Equation coefficient indicates the speed of adjustment moving back the equilibrium in the dynamic model. The *R-squared* and adjusted *R-squared* for ARDL model are both reliably good implying that approximately 79% of total variation in Gross fixed capital formation in Kenya is explained by the Domestic debt, Gross domestic savings, Financial development (Domestic credit to private sector refers to financial resources provided to the private sector, such as through loans, purchases of non-equity securities, trade credits and other accounts receivable).

4.4   Model 2 results (Additional of External debt on the model 1)

From **Table 6** the *F-statistic* (of 3.9) is higher than the upper bound at 95% (of 3.21) or 90% (of 2.89)

implying an evidence of cointegration among the set of I(0) and I(1)) variables under **model 3**. Thus from the findings, the assumption on at least long run or short run relation between External debt, Domestic debt, financial development, gross development savings, Lending rate and Gross Domestic Product per Capita and Gross fixed capital formation.

Table 6: ARDL Bound Test for Integration - Model 1

Test Statistic	Value	k
F-statistic	3.902990	7
Critical Value Bounds		

Significance	I0 Bound	I1 Bound
10%	1.92	2.89
5%	2.17	3.21
2.5%	2.43	3.51
1%	2.73	3.9

Table 7 : Estimated Long Run Coefficients – Model 1

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DD	–0.370501	0.220087	–1.683428	0.1144
FD	1.504910	0.936048	1.607728	0.1302
GDS	–0.193839	0.435720	–0.444871	0.6632
LR	–0.063429	0.259670	–0.244268	0.8106
GDPCR	1.428889	0.517989	2.758530	0.0154
ED	0.223510	0.205926	1.085387	0.2961
STBR	–0.724833	1.724623	–0.420285	0.6807
C	–16.892443	20.002704	–0.844508	0.4126

The Estimated Model for Long term is

$$GFCF = -0.3705*DD + 1.049*FD - 0.1938*GDS - 0.0634*LR$$
$$+0.2235*ED+1.4289*GDPCR \ -0.7245*STBR – 16.8924+ \varepsilon_t$$

Table 8: Short-run estimation effects - Model 2

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(GFCF(-1))	–0.418660	0.097573	–4.290754	0.0007
D(DD)	–0.188222	0.030473	–6.176733	0.0000
D(FD)	0.494611	0.089888	5.502508	0.0001
D(FD(-1))	0.587749	0.105551	–5.568376	0.0001
D(GDS)	0.137288	0.062707	2.189363	0.0460
D(GDS(-1))	0.489170	0.051821	9.439578	0.0000
D(GDS(-2))	0.418887	0.077449	5.408564	0.0001
D(LR)	0.004472	0.049571	0.090206	0.9294
D(GDPCR)	0.482055	0.062083	7.764693	0.0000

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(GDPCR(-1))	-0.238201	0.075606	-3.150549	0.0071
D(ED)	0.065760	0.018427	3.568631	0.0031
D(ED(-1))	-0.096993	0.016311	-5.946452	0.0000
D(ED(-2))	-0.111746	0.020373	-5.485139	0.0001
D(STBR)	-0.683939	0.624560	-1.095073	0.2920
D(STBR(-1))	-3.159067	0.697762	-4.527430	0.0005
D(STBR(-2))	-1.261005	0.496214	-2.541250	0.0235
CointEq(-1)	-0.416659	0.058298	-7.147056	0.0000

R-squared	0.944826	Durbin-Watson stat	2.267894
Adjusted R-squared	0.858124	Prob(F-statistic)	0.000018

From **table 7**, the ARDL result again shows that there is an insignificant negative long-run relationship between Domestic debt and gross fixed domestic capital formation product suggesting that an increase in domestic debt negatively affects gross fixed capital formation in Kenya. Specifically, 10% change in domestic debt will result in 3.7%% decrease in gross fixed capital formation as a percentage of GDP. However, external debt positively but insignificantly affects gross fixed domestic capital formation. This is in contrary with findings by Abbas and Christensen (2007) in which it was established that moderate domestic debt levels drive economic growth.

However, in the short run (**Table 8**), there is a significant negative relationship between Domestic debt and gross fixed domestic capital formation. The external debt variable on the other hand is positive and insignificant in the long run but negative and significant in the short run. But comparing **model 1** and **model 2**, it can concluded that the effect of Domestic debt on investment does not change on introducing External Debt variable.

Financial Development (FD) proxied as Domestic credit to private sector has positive and significant relationship with gross fixed Domestic capital formation in Kenya in short run and lon run. This suggests that an increase in financial development proxied (increase in Domestic credit to private sector) in Kenya will lead to in capital formation in Kenya hence increased Investments. Gross domestic savings have a positive and significant impact on Gross fixed capital formation in Kenya. The findings agree with the findings of Okorie (2013) who found out that increase in private sector credit (PSC) though not

statistically significant leads to increase in private domestic investment (PDI). This suggests that Private sector funding supports investment and growth more than government borrowing

The results also indicate that GDP per Capita growth positively and significantly affect Gross fixed capital formation and specifically one unit rise GDP per capita leads to 1.4 unit rise in Gross fixed capital formation.

Table 9: Wald Test: ARDLTEST

Test Statistic	Value	df	Probability
F-statistic	4.821156	(7, 14)	0.0060
Chi-square	33.74809	7	0.0000

Null Hypothesis:
C(1)=C(2)=C(3)=C(4)=C(5)=C(6)=C(7)=0

Null Hypothesis Summary:

Normalized Restriction (= 0)	Value	Std. Err.
C(1)	0.141520	0.214079
C(2)	0.411216	0.170172
C(3)	-0.165712	0.066062
C(4)	0.519709	0.206540
C(5)	-0.469661	0.171841
C(6)	0.623044	0.165514
C(7)	0.163825	0.108148

The Wald test coefficient diagnostics was carried out to establish the long run relationship between the variables. From The **table 3** Above C(1), C(2), C(3), C(4), C(5), C(6) and C(7) represent GFCF, DD, FD, GDS, LR and GDPCR respectively as shown in **table 9**.

4.5   Diagnostics Checks

Given the that **Model 2** is nested in Model and given the fact that effects of Domestic debt and Financial development is similar is models, diagnostic test were performed on **model 3.** Diagnostic checks tested included serial correlation, Normality and heteroscedasticity.

According to the ARDL techniques *F statistic* larger than the upper bound like in **table 2** calls for the need to perform diagnostics checks. The three key diagnostic checks to be provided are serial correlation, normality and hetroskedasticity test. From **tables 8** and **9** and f**igure 1** indicate that serial correlation is insignificant at 5% in LM version hence an assumption of no auto-correlation. Similarly normality is insignificant (no issue) and hetroskedasticity is insignificant (no issue) too hence there is no apparent issue which with this model. The results of diagnostics test indicate no sign of autocorrelation of the error terms in the ARDL estimators and the error terms are normally distributed. Moreover, hetrosecdasticity tests evidenced that errors are homoskedastic and independent of the regressors.

Table 10: Breusch-Godfrey Serial Correlation LM Test:

F-statistic	1.446107	Prob. F(2,12)	0.2737
Obs*R-squared	7.185763	Prob. Chi-Square(2)	0.0275

Serial correlation: $F(2,17)=1.85(0.1872)$ is insignificant at 5% in LM version so we can assume that there is no auto-correlation.
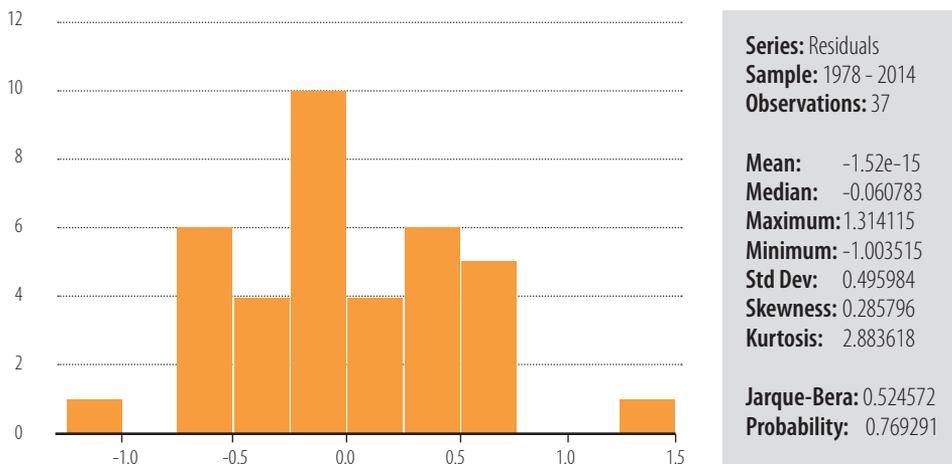
Table 11: Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	0.312332	Prob. F(22,14)	0.9928
Obs*R-squared	12.18123	Prob. Chi-Square(22)	0.9535
Scaled explained SS	1.642504	Prob. Chi-Square(22)	1.0000

Heteroscedasticity: $F(17,19)=0.9217(0.5641$ is insignificant (no issue) too hence there is no apparent issue which with this model. The error terms are normally distributed. Heteroscedasticity tests evidenced that errors are homoscedastic and independent of the regressors

Figure 1: Normality test

Series: Residuals
Sample: 1978 - 2014
Observations: 37

Mean: -1.52e-15
Median: -0.060783
Maximum: 1.314115
Minimum: -1.003515
Std Dev: 0.495984
Skewness: 0.285796
Kurtosis: 2.883618

Jarque-Bera: 0.524572
Probability: 0.769291

Jarque Berra statistics is 0.525 and the corresponding p value is 0.769. Since p value is more than 5 percent we accept null hypothesis meaning that population residual (u) is normally distributed which fulfills the assumption of a good regression line

4.6   Stability Tests

For the test to be to be reliable Cumulative sum (CUSUM) and cumulative sum squares (CUSUMSQ) tests were performed. This procedure is used to test stability of long run coefficients. The graphical representations of CUSUM (**figure 2**) and CUSUMSQ (**figure 3**) are shown below and since plot of this statistics remain within the critical boundaries of

the 5% significance level we cannot reject the Null hypothesis (That is the regression equation is stable and correctly specified). These statistics therefore confirm the stability of long run coefficients of the variables.

The stability of each variables was also tested and the figures above clearly indicates that the statistics of CUSUM, CUSUMSQ and Recursive Residuals (**figure 4 and 5**) are within the boundaries of critical limit at 5% significance level for implying that all coefficients in the error-correction model are stable. Therefore, the selected output model can be used for policy decision making purposes.

Figure 2: Cusum Curve

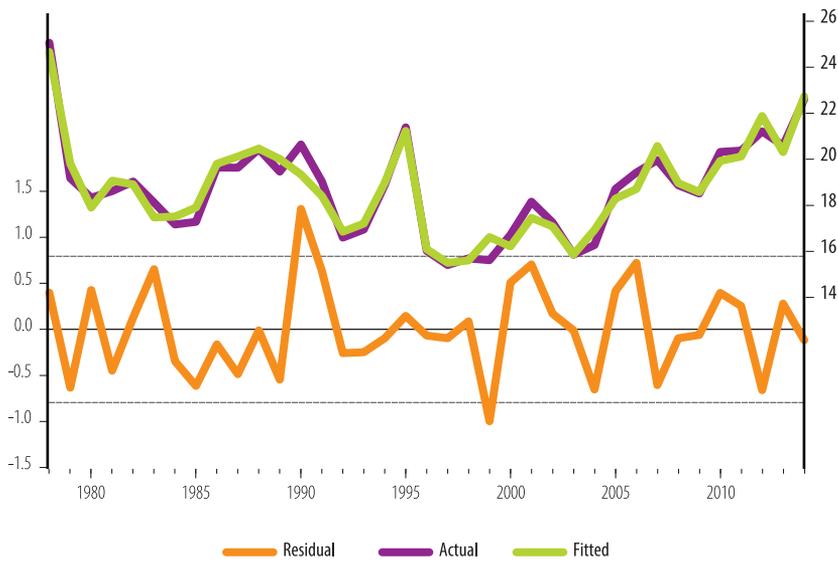CUSUM ----- 5% Significance
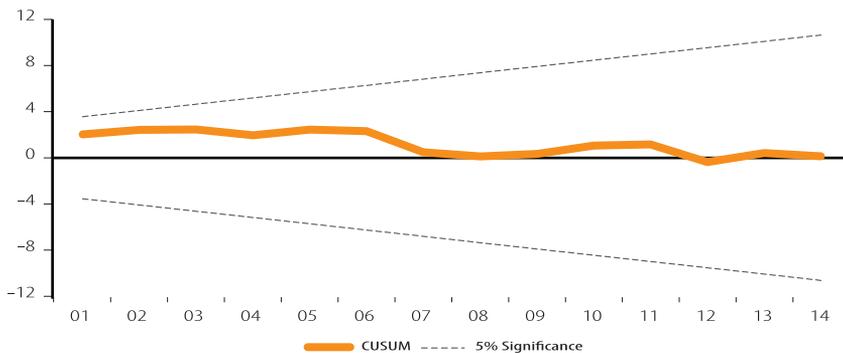
Figure 3 CusumSq Curve
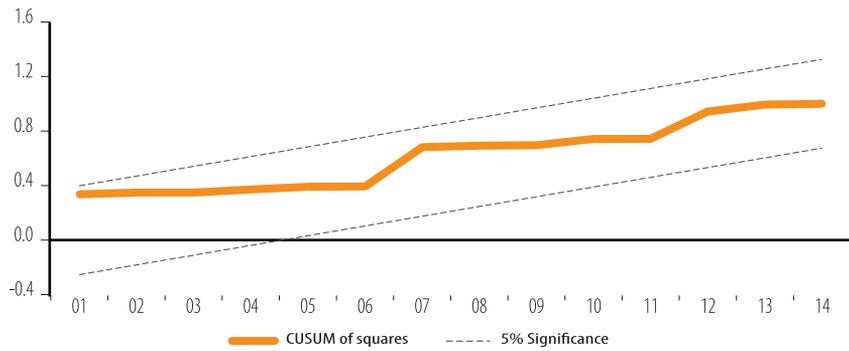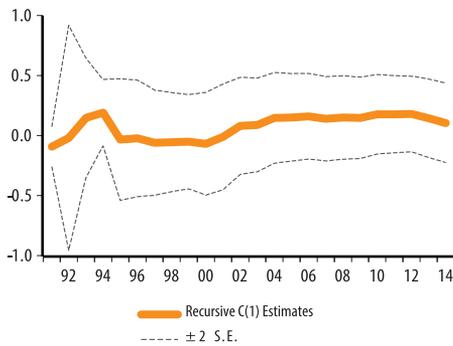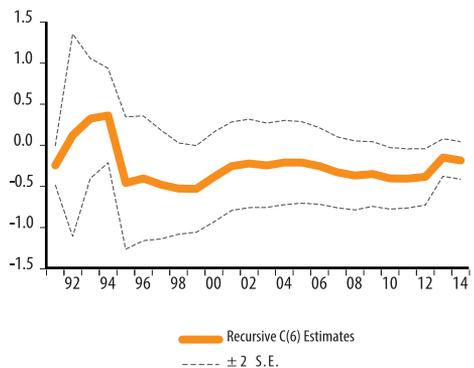

Figure 4: Residuals

Figure 5: Recursive Coefficient Curve

Recursive C(1) Estimates
± 2 S.E.

Recursive C(2) Estimates
±2 S.E.
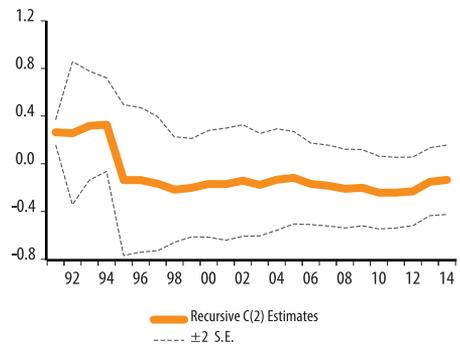
Figure 5: Recursive Coefficient Curve (continued)

Recursive C(3) Estimates
± 2 S.E.

Recursive C(4) Estimates
± 2 S.E.

Recursive C(5) Estimates
± 2 S.E.

Recursive C(6) Estimates
± 2 S.E.

05
FIVE
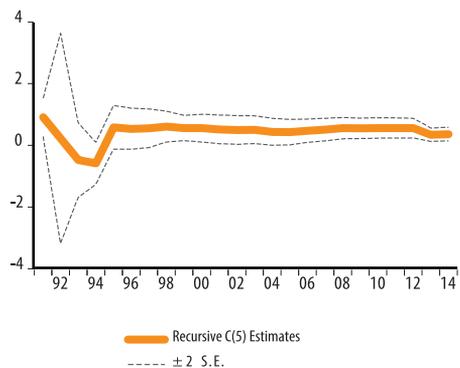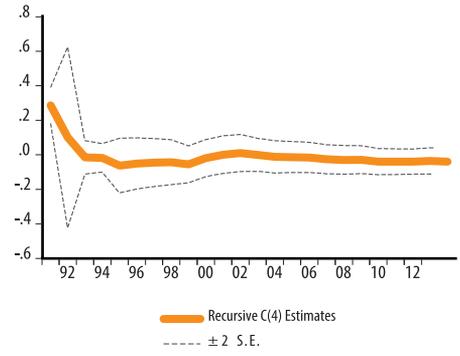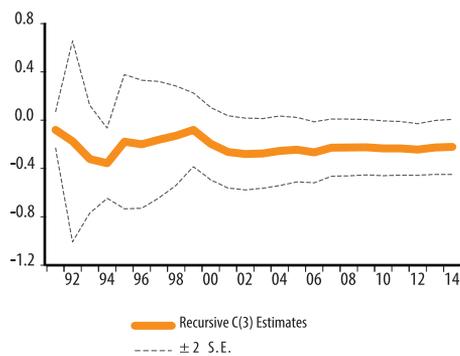
5.0 Summary and Policy Recommendations

The paper sought to examine the empirical analysis of dynamic relationship between Domestic Debt and Gross capital formation in Kenya. The yearly data from 1975 to 2014 was used employing the Autoregressive Distributed Lag (ARDL) Model.

The key findings were that there is evidence of a negative but insignificant long-run relationship between domestic debt and gross fixed capital formation. This result is contrasts with a number of earlier studies by Abbas and Cristen (2007) and Sheish RM et.al (2010) in the literature that found domestic debt positively affects economic growth. However it agrees result of Abbas and Cristen (2007) that , for domestic debt levels above thirty five percent of total bank deposits have negative impact on economic growth .The implication of these findings suggests that a large proportion of domestic debt is not used properly in promoting investment in the country but could be used to finance recurrent expenditure or non-investment projects. The result also implies that domestic saving in the Kenya are never utilized properly hence it does not boost the economy through investment. The result could also imply that a lot of cash is held in the bank account and not being utilized to boost the economy through investment. The interesting findings on financial development (domestic credit to private sector as a percentage of GDP) shows that much of the domestic credit funding to private sector is equally not utilized correctly since for every 1% increase in financial development or alternatively much of the credit is used to fund unviable investment projects which do not contribute positively to the economy.

The interesting result is that real interest rate positively affects Gross fixed capital formation. Specifically 1 basis point change in real

interest rate leads to a 2.4% rise in Gross fixed capital formation. This research finds this variable very important since it could be a pointer to lenders of how much they could earn f they lend to the government to spur investment and economic growth. If the rate of borrowing domestically to finance investment is increased then more money can be generated within to finance investment by the government. The private sector and individuals can also use earned interest to re-invest in other profitable project hence boast the economy.

The implication of these findings suggests that a large proportion of domestic debt to both government and private sector is not properly utilized in viable projects. However, the study showed a negative and significant error correction term which implies the adjustment process to restore equilibrium is very effective.

Based on the research findings, the paper puts across a number of recomendations: First, since there is a negative but insignificant impact of Domestic credit on and investment on the Kenyan economy, appropriate monetary- fiscal policies mix that will encourage better utilisation of domestic debt for both Government and private sector in return will foster gross fixed capital formation and boost and investment should be pursued. To achieve this, focus should be the on the following:

i)   The government has to encourage investment by ensuring all funds from domestic borrowing are utilized well to boost the economy and enhance investment avenues.

ii)   Government encouraged to borrow externally rather than internally to allow internally available fund be channeled to local investments by private sector Private sector and government to reduce cash holding in banks but rather invest in short and long term viable projects to boost the economy. However, caution should be observed in external borrowing to ensure that such borrowing is sustainable.

iii) Formulation of lending rate policy that encourages domestic lenders to lend to government and other private sectors firms for investment projects to boost the economy.

iv)   Banks and other financial institutions should be encouraged to fund the Small Micro and Medium enterprises to boost more investment and economic growth.

Conclusion

The study investigated the role of domestic borrowing on private investment growth and development in Kenya over the years. The most robust finding of this paper is that, in the short run government domestic borrowing negatively and significantly affects gross fixed capital formation and hence investment, this however diminishes as in the long run. We also note

that External Debt variable on the other is positive and insignificant in the long run but negative and significant in the short run. But comparing model 1 and model 2, the researcher found out that the effect of Domestic debt on investment does not change on introducing External Debt variable.

There is a strong positive interaction between GDP per capita and investment and also financial development and Investment. This is because private sector funding supports investment and growth more than government borrowing. The effect of negative effect on investment could indicate some evidence of a crowding-out effect, namely that Government borrowing does not support investment. This effect, however, seems to be insignificant.

Although, Abbas and Cristen (2007) stated that domestic debt levels above thirty five percent of total bank deposits have negative impact on economic growth, more research need to be done to establish at what level of domestic debt could actually hurt the Kenyan economy.

The effect of structural breaks is only felt on after one year of introduction in the short run but it actually diminishes in long run. This is the evidence, that structural breaks are not only brought about by political changes but it's a unit of political economy as well. This could also be explained by the changes in the budget cycle that affects different regimes in terms of debt policy and changes in new government structures. This means that the implementation of certain aspects introduced by government only take effect after one year but the effect will also diminish in the long run due to political and policy changes.

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