THE NEXUS BETWEEN PUBLIC DEBT AND GROSS CAPITAL FORMATION IN KENYA

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DECLARATION

This research paper is my original work and has not been submitted for examination in any other university.

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This research paper has been submitted for examination with my approval as the university supervisor.

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LIST OF ABBREVIATIONS

ARDL	Autoregressive Distributed Lag
CBK	Central Bank of Kenya
GCF	Gross Capital Formation
GDP	Gross Domestic Product
GDPPCG	Gross Domestic Product per capita growth
FDI	Foreign Direct Investment
HIPC	Heavily Indebted Poor Country
IMF	International Monetary Fund
KNBS	Kenya National Bureau of Statistics
VAR	Vector Auto Regression
VECM	Vector Error Correction Model
SVAR	Structural Vector Auto Regression

ABSTRACT

Governments seek financial resources from domestic as well as external sources to supplement tax revenues in meeting the financial needs. Kenya has been increasingly borrowing to finance expenditures with an increased investment in public infrastructure. This study sought to investigate public debt and gross capital formation nexus in Kenya. It was done against the background of Classical view of public debt, as funds be used appropriated on production and investment rather than consumption by individuals, Keynesian view that high debt levels leads to an upsurge in taxes which leads to a decrease in investment, lowers consumption, reduces employment and reduces the growth rate of the economy and Ricardo economics that lean towards government spending funded from tax revenue rather than public borrowing. These conflicting views present a theoretical issue for investigation. The study relied on time series data for 1980 to 2019 obtained from CBK, KNBS and World Bank Database. VAR was used to estimate the system of equations that link public debt to gross capital formation empirically. Findings are that one year lag in domestic debt positively affects the current year's gross capital formation. Two year and third year lag in domestic debt were found to have similar results that is a negative effect on the current year's gross capital formation. Lastly, the four year lag also has a negative effect on current year's gross capital formation. On the effect of the external debt, the results show that a one year lag in external debt has a positive effect on current year's gross capital formation. Two year and third year lag in external debt were found to positively affect current year's gross capital formation. However, the four year lag in domestic debt was found to have a negative effect. On the effect of the total public debt, the results indicate that all the four lag has a negative effect on the gross fixed capital formation. These findings shows that total debt comes with large burden on the country's development especially in so far as capital formation is concerned. Accumulation of large debt stock comes with reduced fiscal space which culminates into fiscal consolidation on both the recurrent and capital expenditures. Therefore, the study concludes that public debt has a negative effect on the gross capital formation in Kenya. Recommendations are that policy makers should ensure that debt levels are at sustainable levels to avoid the adverse effects the unsustainable debt levels are likely to have on the economic macroeconomic fundamentals, capital formation being one of them. The study recommends further research on to be conducted a cross country analysis in Sub – Saharan Countries.

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

Kenya's public debt has been rising, owing to a combination of factors one being to finance capital infrastructure. This borrowing has been hinged on the understanding that the capital projects are likely to be productive in future thus enhancing the productive capacity of the economy. The effect of this borrowing can be traced to the bulging current account deficit, which stood at 6.4 percent of GDP in year 2017. This however narrowed to 5.0 percent in 2018 and 4.3 percent as at end of 2019. However, debate has been on the economic viability of such capital investments in realizing the projected cash flows thus leading to the question on the sustainability of the outstanding national debt. In addition, the financial year 2019/2020 has seen the National Treasury allocating more resource towards servicing the already nearly maturing external debts. More specifically, Kshs. 366.4 Billion was allocated on interest payment in which Kshs 215.4 Billion is on domestic debt and Kshs. 150.9 Billion on external loans. This implies an element of capital flight out of the country inform of external debt servicing. As a result, this has a bearing on the capital formation in the country (The National Treasury Budget Report 2019/2020).

In general, analyzing the contribution of government spending to capital production provides a better knowledge on financing of any economy. Despite external and domestic borrowing boosting domestic savings, they are also known to play a role in capital formation and economic growth in general. Capital formation is therefore a fundamental element in determining growth of any economy. Furthermore, it has been determined that growth will only begin once a certain amount of capital has been attained. (Sachs, 2002).

The foregoing scenario is however hardly attained without examining the effect of public debt on gross capital formation (Ricardo, 2001). To achieve the objective, an inquiry into the channel via which debt impact economic growth through gross capital formation is of essence. This is necessitated by the differing theoretical perspectives on how domestic and external debt affects the economy through its effect on capital formation. To this extent, the fundamental research question in this area is if public debt increases or decreases capital formation of an economy?

Kenya debt levels have been on an upward trick over the years. However, the data indicates that the status of the debt has been growing in a gradual manner in the early years but a reversal in the trend is evident from the year 2013 onwards. Keen review of the debt data in table 1.1 reveals that from 1999 to 2001 the government appetite for external debt was more compared to the domestic debt. However, a trend shift is evidenced in 2003 – 2012 where a balance in the external and domestic debt is seen given that the borrowing from the two sources are almost equal (Table 1.1).

Table 1.1: Kenya's public debt levels 1999-2018

Year	Domestic debt (Ksh, Million)	External debt (Ksh, Million)	Total debt (Ksh, Million)
1999	190,300.00	311,953.00	502,253.00
2000	192,665.30	405,355.31	598,020.61
2001	221,984.00	384,302.58	606,286.58
2002	259,828.23	369,729.83	629,558.06
2003	301,190.58	410,149.00	711,339.58
2004	295,374.44	439,992.95	735,367.39
2005	335,001.89	408,601.92	743,603.81
2006	385,121.22	407,742.55	792,863.77
2007	438,059.11	406,923.00	844,982.11
2008	456,227.91	516,671.33	972,899.25
2009	588,970.31	588,970.31	1,177,940.63
2010	720,207.97	599,930.46	1,320,138.43
2011	799,880.06	685,607.92	1,485,487.98
2012	971,265.44	821,972.82	1,793,238.26
2013	1,189,182.59	922,369.15	2,111,551.74
2014	1,307,748.71	1,170,696.28	2,478,444.99
2015	1,540,579.13	1,615,184.20	3,155,763.33
2016	1,930,855.01	1,896,443.05	3,827,298.06
2017	2,220,345.35	2,349,284.44	4,569,629.79
2018	2,548,768.78	2,723,734.27	5,272,503.04

Source: Central Bank of Kenya, 2019.

In the year 2012, the total public debt was estimated at 20% of GDP equivalent of Kshs. 629 Billion (CBK, 2013) and as at The Quarterly Economic and Budgetary Review report of the National Treasury asserts that, the external borrowing outpaced domestic borrowing over 1999 – 2018 period with an exemption of some years as evidenced by Table 1.1. The results also show that as at the end of 2018 of the gross borrowing 48.34% is domestic debt and 51.66% is external debt.

In overall, gross public debt reached Kshs. 2.0 Trillion mark in 2013 after which it has assumed a sharp upward trajectory trend to Kshs. 5.27 Trillion as at end of 2018. This sharp rise in the overall public debt can be assigned to increased government borrowing towards investment in the capital

infrastructure such as Standard Gauge Railway, the expansion of the ports including the new transport corridor linking a new and modern Port of Lamu and other major infrastructural projects.

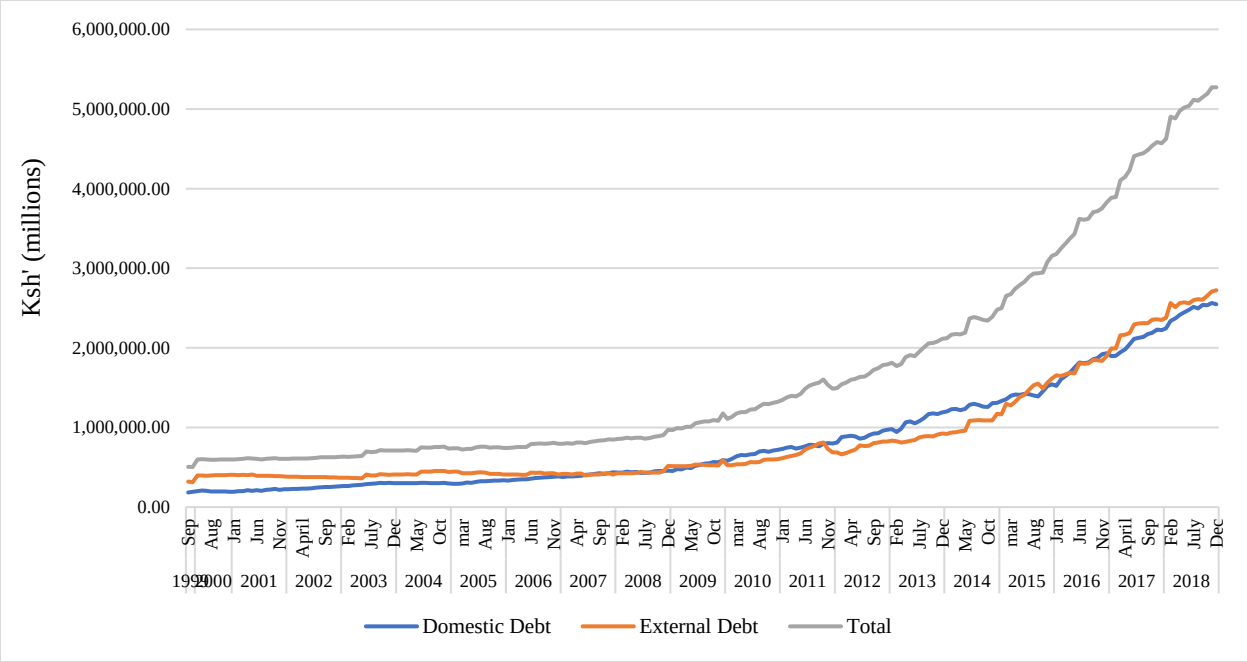

Figure 1.1: Trends in public debt in Kenya, 1999-2018

Source: Central Bank of Kenya, (2018).

Based on figure 1.2, it can be deduced that public debt and gross capital formation in Kenya have been negatively correlated. A rise in public debt is accompanied by a reduction in gross capital formation, and vice versa. From 2014, public debt as a proportion of GDP has steadily improved. This is due to rising government borrowing, which is mostly used to fund recurrent expenditure. There is a rise in the domestic borrowing from year 2014 onward can be largely attributed to reduced space for external borrowing following the massive government external borrowing to finance capital projects. Further, with the implementation of decentralized government system, the rise in the domestic borrowing to finance the recurrent expenditure for both the county and national governments has been inevitable as evidenced by figure 1.1. The decline in gross capital accumulation could, however, be as a result of other factors, hence the need for this study.

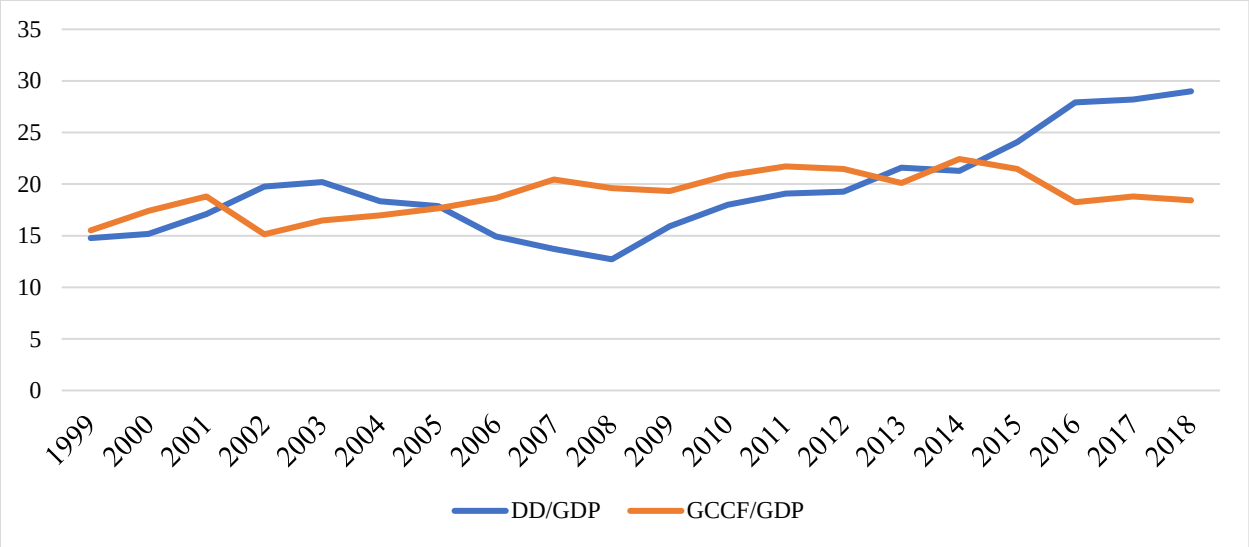

Figure 1.2: Trends in domestic debt and gross capital formation in Kenya, 1999-2018

Source: World Bank Database (2018) & Central Bank of Kenya (2018).

1.2 Research problem

Scanty empirical work on public debt – gross capital formation nexus exists. According to some empirical studies, public debt favours a country's gross capital formation. Debi (2014) reports a positive debt - gross fixed capital formation relationship for 1998 – 2012 period in Pakistan thus broadly supporting the views of Keynesian economists. However, Omodero (2019) report the contrary in Nigeria. In addition, Aschauer (2000) acknowledges that when a government debt is spent on capital formation, domestic investment increases. Further, Apere (2014) found a linear positive relationship in Nigeria.

Government debt however has been established to negatively impact a country's gross capital formation in a number of empirical studies. Abdullah et al. (2016) used the ARDL model to establish impact of debt on capital creation in Nigeria from 1980 to 2013 established an impact of external debt that it negatively affects capital formation and is statistically significant. Ndoti and Korir (2018) in Kenya report similar results. Furthermore, Thilanka and Ranjith (2018) investigated the impact public debt has on private capital creation in Sri Lanka from 1978 to 2015. Findings are that public debt crowds in private investment on the long-run. Akomolafe, et. al., (2015) found a negative relationship similar to Shabbir (2013) findings in the Pakistan. King'wara (2014) in Kenya reported similar results.

Several empirical research between relationship between public debt and gross capital formation have shown varied results, with some concluding negative relationship amongst public debt and capital production and others concluding a positive one. This indicates inconclusiveness of the studies hence the need for similar study in the Kenyan context. Further, the studies have more focus on public debt at large with less specialty on domestic debt a shortfall that this study sought to fill in. Furthermore, previous empirical studies in this field have failed to distinguish between effects of public debt on household capital formation and government gross capital accumulation, a gap that this study attempted to close in its modeling and empirical estimates. This is the novelty of this research.

1.3 Research questions

This research study was guided by the following research questions: what is the nexus between public debt and gross capital formation in Kenya?

i. How has public domestic debt affected gross capital formation in Kenya between 1980 and 2019?
ii. How has public external debt affected gross capital formation in Kenya over the period 1980 to 2019?
iii. How has total public debt affected gross capital formation in Kenya over the period under study?

1.4 Objectives of the Study

General objective

The study sought to examine the nexus between public debt and gross capital formation in Kenya Specifically, the study sought:

i. To determine the effect of domestic public debt on gross capital formation in Kenya over the period 1980 to 2019
ii. To determine the effect of public external debt on gross capital formation in Kenya over the period 1980 to 2019
iii. To determine the overall effect of public debt on gross capital formation in Kenya over the study period

1.5 Significance of the Study

This research contributes to policy and existing literature. First and foremost, policymakers at relevant government agencies, it would provide information on the impact of public debt on gross capital formation. This would be core in evaluating whether the debt by the government is geared towards investing in capital investments for future revenue generation or the borrowing is being directed towards financing consumption under the recurrent expenditure. Also, the research findings would inform the National Treasury policy makers on the matters pertaining to debt sustainability. Given that Kenya's current account deficit has been widening being over the 6% of GDP recommended within East African Community argument being deficit need not to be point of concern since its arising from the importation of capital goods that are mainly funded through borrowing. The argument has been that once these capital good begin to be productive, then the current account deficit would narrow. Therefore, results will inform policy makers in substantiating this argument that is in support of need to borrowing.

Secondly is the importance to debt management. Given the current sharp rise in the government debt, there is need to empirically illustrate whether the country is in the verge of facing debt overhang effect. Findings would therefore aid in devising strategy in as much as debt management issues as concerned in order to ensure debt sustainability.

Finally, it would add to the existing knowledge through analyzing the channels via which the public debt influence the economy namely gross capital formation channel. The findings of the study would be crucial in eliciting understanding on which channel is significantly affected by the debt and in what magnitude. This is as opposed to other studies, which focus on the gross capital formation in a holistic manner. Therefore, by decomposing gross capital formation into private and public the study results would elucidate on which channel is more pronounced when it comes to debt – capital formation linkage thus informing appropriate policy pronouncement as well as a key area of research.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

Review of literature is outlined in this chapter. In particular, theoretical and empirical literature, as well as a summary.

2.2 Theoretical Literature

2.2.1 Debt Overhang Theory

The theory was postulated by Myers (1977). Debt overhang is a case where the ability of the economy's external debt repayment tends to fall below the contractual value of debt. According to the theory, ability of the firms to make prime decisions on their investments in future time horizons is altered by high levels of debt stocks in an economy. The rationale here is that the firms are unable to objectively determine the actual net present values of their investments given that proportions of their future incomes are likely to be channeled towards debt repayments as promised payments.

According to the theory, any form of alteration in public expenditure out rightly disrupts private sector investments (crowding our effect – either via price or quantity channels). The result is the rise in the market interest rates arising from the debt interest repayments. This further reduces public sector savings. To counter the private savings decline, the private sector savings have to rise by similar magnitude that the public sector savings fall by. However, if the alteration in the public debt leads to private sector crowding out effect, the result would be depressed economic growth.

As the theory suggest, nonlinear economic growth could be experienced could arise as a result of high public debt stocks. Such nonlinearity of the growth trends could be explained by either capital accumulation or growth in productivity. Arising from such growth non – linearity is the scenario whereby the capacity of a country to refund the debt fall is less the actual worth of the debt hence the debt overhang. As Krugman (1988) puts it: the domestic investments will fall as investors will shy away from being charged higher taxes to service the debt. Therefore, debt overhang theory asserts that increased borrowing, causes country's inability to repay the debt in the longrun. This

will in turn dampen economic growth via possible negative effect of the borrowing on investments through reduced capital formation.

This theory is relevant in this research in the distinguishing the private capital formation from public investment and how the two relate to each other in the context of increased public debt. This distinction informs the separate modelling of the private and public gross capital formation in the empirical models of the study.

2.2.2 The Financing Gap Theory

Financing gap exists as a fact that the government revenues generated from the internal sources are generally inadequate in financing the total investment requirements. Such a scenario necessitates for the government to borrow to finance the gap. Based on this theory, Easterly (1999) articulates that an equivalent linkage between investment spending and economic growth. This argument was well articulated in the publication by Domar (1946) relating capital expansion, growth rate and employment levels.

The theory was further augmented to works of Rostow (1960) his work entitled the stages of economic growth. According to this work, a country undergoes 5 consecutive stages in developing from less developed to a developed economy. In the process, investment expenditure will definitely inform development on the long run. According to Rostow, for an economy to take – off a country is required to invest approximately 5 to 10 percent of its earnings. Given this requirement, it clear that less developed economies cannot afford such proportions of resources hence warranting the need to borrow from the external sources to bridge the gap.

Latter on Chenery and Strout (1966) augmented this theory by calling for the countries to enhance internal / national savings so that incase of revenue shortfall to adequately finance the expenditure, the savings could be relied upon to fill in the financing gap as opposed to foreign borrowing. Therefore, they advocated for self – financing as opposed to foreign borrowing. The theory is applicable in this study by conceptualizing the rationale for government borrowing to finance its development expenditure financial gap through debt to build up physical capital.

2.2.3 Crowding out effect theory

Keynes came up with the concept of crowding out (1939). According to the theory, a scenario where a government's spending reduces the private sector's spending is referred to as the private sector's crowding-out effect. According to Keynes, this generally arises from the government adoption of the expansionary fiscal policies. As a result, any increase in the government spending will necessitate the government to acquire funds in order to finance a deficit thus locking private sector from access finances from the credit market. This results in crowding out of the private sector's effect on the loan market. The assumption here is that the credit market is mutually exhaustive such that the borrowing by one economic agent reduced the amount of credit available for the other agents to borrow. It is notable that crowding out could be in form of price channel or quantity channel.

However, the entry of the monetary economist in 1970s set a stage for the questioning of the crowding out theory from its basic assumption upon which the theory is hinged. Monetary economists by large extent questioned the assumption of the role of the state as well as the application of fiscal policy by the government in pursuit of macroeconomic stability. This led to a conclusion that though it existed, the crowding out effect had a weak effect at best but mostly dependent on the various markets' elasticities.

According to Karagol (2002), crowding out effect is one of the channels via which the government borrowing affect economic growth at large. In this case a scenario whereby a sizeable proportion of foreign capital is committed towards external debt servicing, little foreign capital is left for any meaningful investment this crowds out the public investment expenditure. Hence, has an indirect effect on the private expenditure via its direct effect on the public investment expenditure.

On the other hand, it can however be argued that, public investment positively influences private capital formation due to the fact that it creates a favourable environment for investment. Investment in infrastructure, such as roads, railway, and development of energy source among other encourage private investors to increase their investment in the areas where such investment is desirable. Therefore, the application of the crowding out hypothesis in this study is in conceptualization of whether domestic borrowing by the government to finance government expenditure has an effect on the private investment. This effect could be through either the price

(domestic market interest rate) or the quantity channel (amount available for borrowing by the private sector from the financial markets).

2.2.4 Balanced Theory of Capital Formation

This theory is credited to Rosenstein Rodan (1943), Nurkse (1953) and Fleming (1955). According to this hypothesis, vicious cycles of poverty are a prominent feature of less developed economies. These cycles are occasioned by the underdeveloped manufacturing sector in these countries, underdeveloped markets with low per capita among other economic bottlenecks just to mention but a few.

According to the authors, investment by individuals are inadequate to break these poverty cycles. This realization therefore calls for the less developed economies to rethink on how to expand and modernize their industrial sector. The author therefore advocate for the less developed economies to simultaneous investment in the underdeveloped sector / industries in order to bring them as per with the other developed sectors / industries hence the name balanced growth. A keen review of this theory elicits the understanding of the balanced growth to imply a balanced development between two sectors namely: industrial and agricultural sector. It could also imply improvement between consumer and capital goods industries simultaneously or improvement between domestic consumptions and foreign trades simultaneously. In addition, it could mean balancing investment in both the social overhead capital and directly productive investments or even ensuring a balance between vertical and horizontal external economies. In a nutshell, the balanced growth theory advocates for unbiased investment initiatives across all sector of the economy.

Tied to the argument for balanced growth theory is the Big Push Theory by Rodan (1943). This calls for less developed economies to set aside a minimum amount of capital for investment that would launch the economy in a trajectory economic growth path. Such investments are however advised to be complimentary in nature if the target objective is to be achieved. Therefore, the application of the balanced theory of capital formation in this study is in conceptualization of how a developing or underdeveloped country can build on her capital to break the vicious circles of poverty. One of the channels is through borrowing to finance development of the physical overhead capital that would ultimately spur investments. As such, the theory can be applied to

conceptualize the relationship between public debt and capital formation linkage and channels of capital formation in this case the borrowing channel.

2.3 Empirical Literature on debt and capital formation

From public finance, it can be noted that the Ricardian equivalence hypothesis stipulates that relying on either taxation or borrowing for financing of public expenditure has similar effect. The argument is hinged on the premises that when the government borrows the repayment of the borrowed funds will be financed through taxation. The implication here is that individuals will increase their savings by purchasing government securities mainly treasury bonds. However, its notable that from the Keynesian economics from the IS – LM model the increase in the government borrowing (debt) arising from the need to finance fiscal deficit will definitely increase national income levels, raise transactionary demand for money and ultimately increase prices in the economy. Gulley (1994), Gulley (1994), Evans (1987) and Barro (1987) who are in support the Ricardian equivalence hypothesis report a conclusion of no evidence of the linkage between government debt and interest rates.

Keynesian economics advocates that when private sector views public sector government securities as net wealth, the government's budget shortfall causes an increase in private sector spending, money transaction demand, interest rates, and prices. Therefore, going by the Keynesian theory, the effect of expansionary fiscal plan on the capital formation in an economy can be sustained via the multiplier effect on the expansionary policy. However, on the other hand, the monetary economist are on the contrary argument. Their argument is that the definite macroeconomic effect of government's fiscal deficit financing decision is the crowding out of the private investments via increased interest rates. Bahmani-Oskooee and Payesteh (1994) in support of Keynesian economics, it is claimed that in the long run, government debt raises interest rates, resulting in more capital formation. According to economic theory, public debt boosts interest rates, which increases capital formation in years to come.

Most studies seek to establish how economic growth is affected by debt. This part therefore reviews available empirical works on effects of debt on gross capital formation. Debi (2014) analyzed relationship between domestic debt and capital formation in India during 1998 to 2012 using structural VAR. Results conclude an effect on gross fixed capital formation and on growth

that is positive. These findings to a large extent support the Keynesian economists argument of the expansionary fiscal policy.

Further, Abdullah et al (2016) analysed how debt impacted on capital formation in Nigeria from1980 – 2013 period using the Autoregressive Distributed Lag model. External debt negatively affects on capital formation, according to the findings only savings were found to have bidirectional causal causality. In the Kenyan context, Ndoti and Korir (2018) adopting a longitudinal research design investigated how servicing debt affects capital formation and gross domestic product in Kenya. Results are that lagged servicing of debt adversely affects capital formation.

Omodero (2019) examined link between debt financing and public capital investment in Nigeria for 1996 - 2018 period using the OLS regression. Results indicate that debt investment on capital is negatively affected. However, debt servicing costs incurred have a significantly affect capital investment negatively. Recommendations are that borrowed funds be invested in profitable programmes to offset the negative effect the public debt has on capital formation in Nigeria.

Aschauer (2000) acknowledges that when a government debt is spent on capital formation, it results in an increase in domestic investment. However, if the public debt is used to purchase consumables that does not directly translate into capital formation. Thilanka and Ranjith (2018), studied effect of public debt on private capital formation between 1978 and 2015 in Sri Lanka using Johansen co-integration test using VECM. Findings indicate that over a period of time, private investment is crowded out by public debt. Recommendations are that appropriate fiscal procedures be used to manage government borrowing.

Apere (2014) studied impact of domestic debt on private capital formation in Nigeria during 1981 and 2012 using instrumental variable estimation procedure with bootstraps. Results are that there is a positive linear outcome of domestic debt has on private capital formation process. Akomolafe, et. al., (2015) investigated how public borrowing affects private capital formation and investment in Nigeria considering debt decomposition into external debt and domestic debt using VECM. Results show that private domestic investment is crowded out by public domestic debt, negatively affecting private capital formation.

In Kenya, King'wara (2014) examined the how public domestic debt affects private capital formation and investment for 1967 to 2007 period. Using a VAR model the findings indicate detrimental impact caused by increased borrowing on private capital formation and investment. Shabbir (2013) explored the link between capital formation debt and in developing economies for 70 developing countries in the 1976 to 2011 period. The study found that high debt stocks lowers the space for fiscal policy to be applied affectively hence dampening the economic growth over a period of time.

Huang, Panizza and Varghese (2018) investigated whether public debt crowds out private investments for advanced and emerging countries. A negative relationship was found. Industry level analysis found a much more industry damaging effect of government borrowing through reduced firm cash flows hence crowding out effect through tightening credit constraints. Further, Abdullah, Bakar and Hassan (2016) modelled the debt overhang versus crowding out effects. Findings assert that almost all the economies tend to contend with the debt especially external debt. They assert that over the last 50 years, Sub Saharan African economies have faced negative consequences in terms of crowding out effects and debt overhang, as debt and most importantly external debt dampens capital formation among the Sub Saharan African economies.

In Kenyan context, Were (2001) modelled external debt servicing and GDP and capital formation for 1970 – 1995 period. A negative between external debt stock and capital formations was found. The findings confirm that Kenya stands to experience the effects of debt overhang. However, positive side, findings show that the current debt inflows positively shocked investments by the private sector. Regarding debt servicing, the study reports an element of quantity crowding out of the private investments.

2.4 Overview of literature review

Various empirical research have been done to establish the link public debt has on capital formation. Reviewed literature supports of two strands. Some studies are in support of the Keynesian argument which advocate for expansionary fiscal policy. Other studies, on the other hand, support the classical economists' argument that indebtedness today is a future tax as policy makers tend to raise taxes in order to service debt. A negative impact on capital formation is created and thus slows economic growth. (Ndoti and Korir, 2018 and Abdullah *et al*, 2016).

It is also, in the reviewed literature, debt - capital formation nexus studies present some research gaps that provide opportunity for further research. First, it is notable that majority of the studies have majored in focusing on debt – growth nexus. Only a few of the studies are on channels via which debt affect economic growth specifically gross capital formation channel. In addition, even the studies that have directly addressed the debt - capital formation nexus the decomposition of debt into external debt and domestic debt along with the decomposition of capital formation into private and public gross capital formation in the empirical analysis is minimal at best.

This study would fill in these gaps by directly addressing debt – gross capital formation nexus channel. In addition, the study sought to decompose gross capital formation into household sector and public capital formation as well as decomposition of debt into external and internal debt. This will ensure clear determination of how external debt affects private and public capita formation and also how internal debt affects private and public capita formation. This conceptualization is based on the understanding that the effect the external debt has on the private and public capital formation is different from effect domestic debt has on private and public capital formation. Thus is because external debt and internal debt are mutually exhaustive just as private and public capital formation is mutually exhaustive.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

The methodology offering detailed way in which the study was undertaken is outlined and explained in this chapter. It encompasses the methodology on how objectives of the study were achieved by defining the econometric modelling, theoretical conceptualization and variables measurement.

3.2 Theoretical Framework

This study focused on effect of public debt on gross capital formation in Kenya. According to the empirical literature, it evident an investigation on effect of public debt on capital formation has an economic long-term effect that needs to be taken into account. Abdullah et al (2016) examined how Nigerian capital formation was affected by debt on capital for 1980 – 2013 period. Similarly, Thilanka and Ranjith (2018) applied the ARDL in Sri Lanka context in relating public debt on private capital formation performance for 1978 –2015 period. Equation 3.1 offers the empirical model applied by these two studies.

$$PI_t = \alpha_0 + \alpha_1 \text{Debt}_t + \sum_{j=2}^{n} \alpha_j X_{j,t} + \varepsilon_t \quad \ldots\ldots (3.1)$$

where PI_t is private investment, Debt_t is public debt, X_t is control variables vector of interest rates and private sector credit. The model parameters are denoted by α_j. ε_t is the error term. The Johansen co-integration test was applied to establish the long run outcome of public debt on private capital formation. Using maximum likelihood estimates method, the assessment evaluates validity of a cointegrating relationship. The null hypothesis for the test is that there are zero cointegrating equations implying no cointegration. The study applied Trace and Maximum Eigenvalue tests under Johansen cointegration. They are similar but their difference though minimal is in the way they define the null hypotheses. However, despite their difference in definition of the null hypothesis the conclusion of the test are similar hence yields no inconsistency in the test results.

The VECM was used for empirical analysis as illustrated:

$$\Delta PI_t = \alpha_0 + \gamma_1 PI_{t-1} + \alpha_1^+ Debt_t^+ + \alpha_1^- Debt_t^- + \sum_{j=2}^{n} \alpha_j X_{j,t} + \sum_{t=0}^{t} \left(\beta_{1,t}^+ \Delta Debt_{t-1}^+ + \beta_{1,t}^- \Delta Debt_{t-1}^-\right) + \sum_{j=2}^{n} \sum_{t=0}^{t} \beta_{i,j} \Delta X_{j,t-i} + \varepsilon_t \quad \ldots\ldots\ldots\ldots\ldots (3.2)$$

$$\Delta PI_t = \alpha_0 + \gamma_1 PI_{t-1} + \alpha_1^+ Debt_t^+ + \alpha_1^- Debt_t^- + \sum_{j=2}^{n} \alpha_j X_{j,t} + \sum_{t=0}^{t} \left(\beta_{1,t}^+ \Delta Debt_{t-1}^+ + \beta_{1,t}^- \Delta Debt_{t-1}^-\right) + \sum_{j=2}^{n} \sum_{t=0}^{t} \beta_{i,j} \Delta X_{j,t-i} + \varepsilon_t \ldots\ldots (3.3)$$

Akomolafe, et. al., (2015) studied the Nigerian economy in pursuit of exploring how private capital formation and investments faired in the context of developments in the public borrowing taking into account the separate effect of external debt and domestic debt. VECM and Johnasen Co-integration test were relied on for econometric modelling in the study. A later study by Huang, Panizza and Varghese (2018) explored the corporate investment crowding out by public debt through the application of non-linear autoregressive distributed lags (NARDL) model.

$$I_{i,c,t} = \beta I_{i,c,t-1} + \delta I_{i,c,t} + (\gamma_1 + \gamma_2 GD_{c,t}) CF_{i,c,t} + \alpha_i + \theta_{ct} + \varepsilon_{i,c,t} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (3.4)$$

where I is fixed capital investments, CF is the cash flows and S is the sales turn overs.

In the Kenya context, King'wara (2014) applied the VECM to model how the private capital formation and investments is affected by developments in the public domestic debt for 1967-2007 period. Based on the above evidence from prior studies, it calls for the employment of a model that is capable of testing for the link between debt and capital formation on the long run

since they are both macroeconomic variables. In addition, the need for a system of equations to be estimated simultaneously. In this case a Vector Auto Regression (VAR) model would be ideal. The determination of whether to estimate VAR model or VECM will be guided by the existence of cointegration in the model which would inform the number of cointegrating equations also referred to as the number of restrictions to be imposed von the VAR model.

3.3 Analytical Model

The study adopted the empirical model by Debi (2014). The Vector Auto Regression (VAR) model was be applied for the empirical modeling. The choice for VAR model and not the VECM is informed by the econometric understanding that VECM is a restricted VAR model. Further, what informs the adoption of the VECM is the presence or absence of cointegrating equations. If there is cointegration, then the VAR model is estimated restricting it to the number of cointegrating equations, which results to the VECM. Therefore, since the VAR model is the basis for VECM then the study would adopt the VAR model. Upon the establishments of cointegration among the variables then the restricted VAR guided by the number of cointegrating equations would be estimated. The study adopted the Sims (1980) proposed VAR model. The general presentation of the model is defined in equation 1.

$$Y_t = \beta^* X_t' + e_t' \ldots\ldots (3.5)$$

Within the model, Y_t is endogenous variables vector, X_t is endogenous variables in lagged form and $e_t'$is model error term. A structural VAR is preferred in this study to enable the examination of structural shocks on model variables in the respective system of equations. Further, the structural VAR model is advantageous given that in conducting the impulse response analysis the model is capable of generating the non-recursive orthogolisation of the model residual terms.

$$GFCF_t = \alpha_0 + \beta_1 Domestic\ Debt_t + \beta_2 GDPPCG_t + \beta_3 Openness_t + \beta_4 Domestic\ Savings_t + \beta_5 FDI_t + \varepsilon_t \ldots\ldots (3.6)$$

$$GFCF_t = \alpha_0 + \beta_1 External\ Debt + \beta_3 GDPPCG_t + \beta_4 Openness_t + \beta_5 Domestic\ Savings_t + \beta_6 FDI_t + \varepsilon_t \ldots\ldots (3.7)$$

$$GFCF_t = \alpha_0 + \beta_1 Public\ Debt + \beta_2 GDPPCG_t + \beta_3 Openness_t + \beta_4 Domestic\ Savings_t + \beta_5 FDI_t + \varepsilon_t \ldots\ldots (3.8)$$

Where:

GFCF	-	is the Gross Fixed Capital Formation in a given year.
GDPPCG	-	is the Gross Domestic Product per capita growth
Openness	-	is the openness of the economy
FDI	-	is Foreign Direct Investment

Public Debt - is the total public debt (Domestic plus foreign debt)

Equation 3.6 addresses the effect of domestic public debt on gross capital formation in Kenya, equation 3.7 addresses the effect of external public debt on gross capital formation in Kenya and equation 3.8 addresses the overall effect of public debt on gross capital formation in Kenya

From the general VAR representation, the econometric VAR model of order p for public sector capital formation is defined as follows:

$$KF_t = \varphi_0 + \phi_1 KF_{t-1} + ... + \phi_P KF_{t-p} + \lambda_1 InternalDebt_{t-1} + ... + \lambda_1 InternalDebt_{t-p} + \delta_1 ExternalDebt_{t-1} + ... + \delta_1 ExternalDebt_{t-p} + \varphi_1 X_{t-1} + ... + \varphi_P X_{t-P} + \varepsilon_t ....(3.10)$$

$$InternalDebt_t = \lambda_0 + \lambda_1 InternalDebt_{t-1} + ... + \lambda_1 InternalDebt_{t-p} + \delta_1 ExternalDebt_{t-1} + ... + \delta_1 ExternalDebt_{t-p} + \phi_1 KF_{t-1} + ... + \phi_P KF_{t-p} + \varphi_1 X_{t-1} + ... + \varphi_P X_{t-P} + \varepsilon_t .....(3.11)$$

$$ExternalDebt_t = \lambda_0 + \delta_1 ExternalDebt_{t-1} + ... + \delta_1 ExternalDebt_{t-p} + \lambda_1 InternalDebt_{t-1} + ... + \lambda_1 ExternalDebt_{t-p} + \phi_1 KF_{t-1} + ... + \phi_P KF_{t-p} + \varphi_1 X_{t-1} + ... + \varphi_P X_{t-P} + \varepsilon_t .....(3.12)$$

$$X_t = \varphi_0 + \varphi_1 X_{t-1} + ... + \varphi_P X_{t-P} + \phi_1 KF_{t-1} + ... + \phi_P KF_{t-p} + \lambda_1 InternalDebt_{t-1} + ... + \lambda_1 InternalDebt_{t-p} + \delta_1 ExternalDebt_{t-1} + ... + \delta_1 ExternalDebt_{t-p} + \varepsilon_t ....(3.13)$$

In addition, the general VAR representation, the econometric VAR model of order p for private / household sector capital formation is defined as follows:

$$KFh_t = \varphi_0 + \phi_1 KFh_{t-1} + ... + \phi_P KFh_{t-p} + \lambda_1 InternalDebt_{t-1} + ... + \lambda_1 InternalDebt_{t-p} + \delta_1 ExternalDebt_{t-1} + ... + \delta_1 ExternalDebt_{t-p} + \varphi_1 X_{t-1} + ... + \varphi_P X_{t-P} + \varepsilon_t ....(3.14)$$

$$InternalDebt_t = \lambda_0 + \lambda_1 InternalDebt_{t-1} + ... + \lambda_1 InternalDebt_{t-p} + \delta_1 ExternalDebt_{t-1} + ... + \delta_1 ExternalDebt_{t-p} + \phi_1 KFh_{t-1} + ... + \phi_P KFh_{t-p} + \varphi_1 X_{t-1} + ... + \varphi_P X_{t-P} + \varepsilon_t .....(3.15)$$

$$ExternalDebt_t = \lambda_0 + \delta_1 ExternalDebt_{t-1} + ... + \delta_1 ExternalDebt_{t-p} + \lambda_1 InternalDebt_{t-1} + ... + \lambda_1 ExternalDebt_{t-p} + \phi_1 KFh_{t-1} + ... + \phi_P KFh_{t-p} + \varphi_1 X_{t-1} + ... + \varphi_P X_{t-P} + \varepsilon_t .....(3.16)$$

$$X_t = \varphi_0 + \varphi_1 X_{t-1} + ... + \varphi_P X_{t-P} + \phi_1 KFh_{t-1} + ... + \phi_P KFh_{t-p} + \lambda_1 InternalDebt_{t-1} + ... + \lambda_1 InternalDebt_{t-p} + \delta_1 ExternalDebt_{t-1} + ... + \delta_1 ExternalDebt_{t-p} + \varepsilon_t ....(3.17)$$

Where:

KF is the Gross Fixed Capital Formation for the public sector, KFh the Gross Fixed Capital Formation for the private sector, X are other macroeconomic control variables for the model namely: GDP per capita growth, Foreign Direct Investment, Openness of the economy and domestic savings.

3.4 Definition of variables

Empirical model variables were defined and measured as presented in table 3.1 as follows:

Table 3.1: Definition, measurement and the expected sign of the variables

Variable	Definition	Measurement	Source
Dependent variable			
Gross Fixed Capital Formation	Is the net increase in the fixed capital	Annual Gross Fixed Capital Formation	WDI and CBK database
Public Gross Fixed Capital Formation	Is the net increase in the public sector fixed capital	Annual Gross Fixed Capital Formation from public sector	WDI and CBK database
Private Sector Gross Fixed Capital Formation	Is the net increase in the private sector fixed capital	Annual private sector credit	WDI and CBK database
Independent variable			
Domestic debt	Is the debt owed to local / domestic lenders by the government.	Annual internal government borrowings as a proportion of GDP	Central Bank of Kenya
External debt	Is the debt that owed to foreign lenders by the government	Annual foreign government borrowings as a proportion of GDP	Central Bank of Kenya
GDP per capital growth	Is the country's economic output that accounts for its number of people	Annual growth rate of the country's gross domestic product by its total population.	Central Bank of Kenya
Foreign Direct Investments	Refers to the investment by foreign investor in another country	Annual Foreign Direct Investments stock as a proportion of GDP	Central Bank of Kenya
Openness of the economy	Is the level the economy interconnectedness with the rest of the world	Annual sum of imports and exports as a proportion of GDP	Central Bank of Kenya
Domestic savings	Is the country's GDP net of final consumption expenditure	Annual savings as a proportion of GDP	Central Bank of Kenya

3.5 Data and data sources

Secondary data for 1980 to 2019 period obtained from different sources was used. Domestic Public Debt, External Public Debt, Gross Fixed Capital Formation, Interest Rates, National Income Levels (GDP per Capital growth) and Private Sector Credit was obtained from CBK, KBS, and the World Bank database. With regard to CBK, data on debt was obtained from government finance statistics under the macroeconomic statistics portal while data on interest rates was obtained from the rates statistics portal. The GDP data was obtained the KNBS under the quarterly GDP reports. The GDP data was also be obtained from World Bank Database (WDI) under economy and growth dataset. Data on Gross fixed capital formation was obtained from World Bank Database (WDI) under World Bank national account data which is published under economy and growth dataset. The data frequency was annual.

CHAPTER FOUR

DATA ANALYSIS, RESULTS AND INTERPRETATION

4.1 Introduction

The data analysis, outcomes, and interpretations of the study results are all covered in this chapter. The variables' descriptive statistics, regression model findings, pre- and post-estimation tests are also presented in detail. In addition, it discusses the interpretation of both the tests and regression model.

4.2 Descriptive statistics

The descriptive statistics of the variables indicted that mean gross fixed capital formation was Ksh, 5040 Million with the minimum GFCF being Ksh, 1010 Million and maximum GFCF being Ksh.16600 Million. In terms of GFCF as a proportion of GDP, the descriptive statistics show that the mean GFCF as a proportion of GDP was 19.9 percent with a minimum being 15.00 percent and maximum being 25.45 percent. Regarding the domestic debt, the results show that the mean domestic debt for the period under study was Ksh 821,000 Million with minimum and maximum domestic debt being Ksh 190,000 Million and Ksh 2,790,000 Million respectively. The External public debt statistics indicate that the mean external debt for the period under study was Ksh 802,000 Million with minimum and maximum external debt being Ksh 312,000 Million and Ksh 4,020,000 Million respectively. Regarding the total public debt, the statistics indicate that the mean total public debt for the period under study was Ksh 1,620,000 Million with minimum and maximum total public debt being Ksh 502,000 Million and Ksh 6,810,000 Million respectively.

A review of the control variables indicates that the mean GDP per capital growth for the period under study was 0.895 percent with minimum and maximum GDP per capital growth being -3.95 percent and 5.49 percent respectively. Regarding the FDI as a proportion of GDP, the study results found that the mean GDP per capital growth for the period under study was 0.805 percent with minimum and maximum FDI as a proportion of GDP being 0.005 percent and 3.457 percent correspondingly. Regarding openness of the economy, the results indicate that the mean openness of the economy for the period under study was 54.464 percent with minimum and maximum openness of the economy being 33.401 percent and 72.858 percent respectively. Lastly, regarding the domestic savings as a share of GDP, the descriptive statistics indicate that the mean domestic

savings as a proportion of GDP for the period under study was 16.08 percent with minimum and maximum domestic savings as a percentage of GDP being 7.97 percent and 37.16 percent respectively. This is as shown in table 4.1.

Table 4. 1: Descriptive Statistics

Variable	Obs	Mean	Std.Dev.	Min	Max
GFCF (Ksh, mill)	40	5040	4880	1010	16600
GFCF (% GDP)	40	19.9	2.966	15.004	25.449
GFCF Growth (%)	40	5.063	12.371	-22.721	31.474
Domestic debt (Ksh, mill)	40	821000	590000	190000	2790000
External debt (Ksh, mill)	40	802000	603000	312000	4020000
Total debt (Ksh, mill)	40	1620,000	1190000	502000	6810000
GDP per capital growth (%)	40	0.895	2.364	-3.95	5.494
FDI (% of GDP)	40	0.805	0.834	0.005	3.457
Openness of economy	40	54.464	8.766	33.401	72.858
Domestic savings (% of GDP)	40	16.08	6.156	7.968	37.156

4.3 Diagnostic tests

Optimal number of lags

Prior to estimating an autoregressive model, it is important to investigate the best lag for such a model. In this scenario, such analysis is critical as it informs on the number to use while estimating the model. Failure to determine the ideal lag results in an estimating model that produces inconsistent estimates, which cannot be used to test hypotheses or draw accurate conclusions. When it comes to the statistical analysis arena, four essential criteria are frequently used to determine the best lag for an autoregressive model. The Akaike Information Criterion, the Prediction Error Criterion, and the Schwarz Information Criterion (also known as Bayes) are among them. This is informed by the fact that all the four criteria selected one lag as evidenced by results in table 4.2.

Table 4. 2: Optimal Lag determination

Lag	LL	LR	df	p	FPE	AIC	HQIC	SBIC
0	-2144.85				2.00E+43	119.547	119.654	119.855
1	-1971.77	346.16	49	0	2.10E+40	112.654	113.514	115.117
2	-1931.99	79.548	49	0.004	4.80E+40	113.166	114.778	117.785
3	-1866.15	131.69	49	0	5.20E+40	112.231	114.595	119.004
4	-1647.88	436.53*	49	0	8.1e+37*	102.827*	105.943*	111.756*

Test for cointegration

Prior to estimation the regression model, there is need to examine whether the model variables are cointegrated. This test actually examined whether the model on the long run move in the same direction. For this study Johansen integration test was applied. The study relied on the trace statistic test to determine if the variables are cointegrated on the long run or not. The study results are presented in table 4.3. Using the 5 percent significance level the results indicate that when we compare the trace statistics and 5 percent critical value, the results indicate that there are 0 cointegrating equations. This implies that variables are not cointegrated implying that on the long run. Therefore, on the long run, variables do not move in the same direction. Upon establishing lack of cointegration, the research settled on the VAR model as the appropriate model as opposed to the VECM.

Table 4. 3: Test for Cointegrating equation - Johansen tests for cointegration

Maximum Rank	Parms	LL	Eigen value	Trace statistic	5% critical value
0	56	-1419.9469	.	113.8153*	124.24
1	69	-1403.3124	0.58335	80.5462	94.15
2	80	-1389.8923	0.50654	53.706	68.52
3	89	-1381.2229	0.36637	36.3671	47.21
4	96	-1373.3233	0.34017	20.568	29.68
5	101	-1367.5586	0.2617	9.0386	15.41
6	104	-1364.5957	0.14439	3.1127	3.76
7	105	-1363.0393	0.07865		

4.4 Regression model results

From the diagnostic test for the cointegration, the results posit that there is no cointegration among the model variables. This justifies the case for using VAR model as opposed to VECM. Further, the test for the optimal lag found that all the optimal lag selection criteria chose four lags as the optimal lag. Therefore, to estimate VAR model with 4 lags, results are reported as per the study specific objectives. It is notable that given the length of the VAR model, the study concentrates on the first equation of the VAR model's system of equations which shows the effect of debt on gross capital formation. The other parts of the models are attached as appendices.

4.4.1 Effect of domestic public debt on gross capital formation

To examine the effect of domestic public debt on gross fixed capital formation, a VAR model was estimated using domestic public debt. The results presented in table 4.4 indicate that a one year

lag in domestic debt positively affects the current year's gross fixed capital formation. Further, two year lag in domestic debt was established to negatively affect the current year's gross fixed capital formation. Similar results are reported for third year lag in domestic debt. Lastly, the four year lag in domestic debt was found to negatively affect the current year's gross fixed capital formation. The positive effect in the one year lag could imply that the amount borrowed could be invested in capital projects by the government hence the positive effect. However, the negative effect of the second, third and fourth year lag in domestic on the current year gross fixed capital formation could imply that as the debt becomes due for repayment, the government has set aside some financial resources towards debt repayment that comprises of principal and interest. This implies diversion of financial resources from gross capital formation since the debt repayment implies undertaking fiscal consolidation measures that in turn adversely affects the gross capital formation.

Table 4. 4: Estimation results for effect of domestic debt on Gross fixed capital formation

	Coef.	**Std.Err.**	**z**	**P>z**	**[95%Conf. Interval]**	
GFCF						
L1.	0.486	0.163	2.980	0.003	0.166	0.807
L2.	0.028	0.137	0.200	0.839	-0.240	0.296
L3.	0.479	0.145	3.310	0.001	0.196	0.763
L4.	0.085	0.182	0.470	0.641	-0.272	0.443
Domestic debt						
L1.	1451.910	1252.959	1.160	0.247	-1003.844	3907.664
L2.	-5080.255	1787.206	-2.840	0.004	-8583.114	-1577.396
L3.	- 4526.930	1624.401	-2.790	0.005	1343.163	7710.698
L4.	- 287.444	1463.039	-0.200	0.844	-2580.060	3154.947
GDP per capital growth						
L1.	1.53e+08	4.25e+07	3.610	0.468	7.00e+07	2.37e+08
L2.	1.01e+08	4.60e+07	2.200	0.028	1.10e+07	1.91e+08
L3.	-8.59e+07	5.23e+07	-1.640	0.101	-1.88e+08	1.67e+07
L4.	9.32e+07	4.59e+07	2.030	0.042	3279554	1.83e+08
Foreign direct investments						
L1.	2.24e+08	1.30e+08	1.720	0.085	-3.08e+07	4.79e+08
L2.	-1.18e+08	1.31e+08	-0.900	0.366	-3.74e+08	1.38e+08
L3.	3.99e+07	1.31e+08	0.300	0.761	-2.17e+08	2.96e+08
L4.	-4.93e+08	1.33e+08	-3.710	0.468	-7.54e+08	-2.32e+08
Openness of the economy						
L1.	-5947375	1.86e+07	-0.320	0.750	-4.25e+07	3.06e+07
L2.	4.35e+07	2.13e+07	2.040	0.041	1752273	8.51e+07
L3.	8.45e+05	1.83e+07	0.050	0.963	-3.49e+07	3.66e+07
L4.	4.04e+07	1.71e+07	2.360	0.018	6897545	7.40e+07

Domestic savings						
L1.	-6115195	1.95e+07	-0.310	0.754	-4.44e+07	3.22e+07
L2.	3740998	2.15e+07	0.170	0.862	-3.83e+07	4.58e+07
L3.	-3.14e+07	2.17e+07	-1.450	0.147	-7.38e+07	1.11e+07
L4.	-1.62e+07	2.04e+07	-0.790	0.427	-5.61e+07	2.38e+07
Constant	-3.76e+09	1.31e+09	-2.880	0.004	-6.32e+09	-1.20e+09

4.4.2 Effect of external public debt on gross capital formation

To examine effect of external public debt on gross fixed capital formation, VAR model was estimated using external public debt. The findings of the study are presented in table 4.5 indicate that a one year lag in external debt positively affects the current year's gross fixed capital formation. Further, two year lag in external debt was established to positively affect current year's gross fixed capital formation. Similar results are reported for third year lag in external debt. However, the four year lag in external debt was found to negatively affect the current year's gross fixed capital formation. The positive effect in one, two and three year lag could imply that the amount borrowed could be invested in capital projects by the government hence the positive effect. This is because majority of the external debts have medium term to long term maturity period. This implies that external loans take more time before they are due for repayment. In addition, such debts are mainly capital project funding oriented and therefore they are more likely to have a positive effect on gross fixed capital formation. The negative effect on fourth year lag of external debt on gross fixed capital formation could imply into a scenario whereby external debt are falling due for payment from the fourth year hence the government has to set aside some resources towards servicing of the external debt implying a negative effect on gross fixed capital formation.

However, the negative effect of the second, third and fourth year lag in external on the current year gross fixed capital formation could imply that as the debt becomes due for repayment, the government has to set aside financial resources toward debt repayment that comprises of principal and interest. This implies diversion of financial resources from gross capital formation since the debt repayment implies undertaking fiscal consolidation measures that in turn adversely affects the gross capital formation.

Table 4. 5: Estimation results for effect of external debt on Gross fixed capital formation

	Coef.	**Std.Err.**	**z**	**P>z**	**[95%Conf. Interval]**	
GFCF						
L1.	0.423	0.167	2.540	0.011	0.096	0.749
L2.	0.063	0.141	0.440	0.657	-0.214	0.339

L3.	0.694	0.141	4.910	0.468	0.417	0.971
L4.	-0.208	0.147	-1.410	0.157	-0.497	0.080
External debt						
L1.	2803.800	1453.648	1.930	0.054	-5652.898	45.298
L2.	626.990	2780.258	0.230	0.822	-4822.217	6076.196
L3.	7135.453	2375.927	3.000	0.003	2478.722	11792.180
L4.	-2764.731	1658.587	-1.670	0.096	-6015.501	486.039
GDP per capital growth						
L1.	1.75e+08	3.57e+07	4.910	0.468	1.05e+08	2.46e+08
L2.	7.18e+07	3.98e+07	1.810	0.071	-6163586	1.50e+08
L3.	-6.56e+07	4.50e+07	-1.460	0.145	-1.54e+08	2.26e+07
L4.	-1.48e+07	4.20e+07	-0.350	0.725	-9.71e+07	6.76e+07
Foreign direct investments						
L1.	2.53e+08	1.13e+08	2.240	0.025	3.18e+07	4.74e+08
L2.	3.56e+07	1.08e+08	0.330	0.741	-1.75e+08	2.47e+08
L3.	3.07e+08	1.12e+08	2.760	0.006	8.89e+07	5.26e+08
L4.	-1.96e+08	1.12e+08	-1.760	0.078	-4.15e+08	2.21e+07
Openness of the economy						
L1.	-5884966	1.44e+07	-0.410	0.684	-3.42e+07	2.24e+07
L2.	1.37e+07	1.84e+07	0.750	0.454	-2.23e+07	4.97e+07
L3.	1.25e+07	1.67e+07	0.750	0.455	-2.02e+07	4.52e+07
L4.	3.54e+07	1.43e+07	2.470	0.013	7339451	6.36e+07
Domestic savings						
L1.	-1027209	1.60e+07	-0.060	0.949	-3.24e+07	3.03e+07
L2.	7273452	1.75e+07	0.410	0.679	-2.71e+07	4.17e+07
L3.	-5.33e+07	1.85e+07	-2.890	0.004	-8.95e+07	-1.71e+07
L4.	-2.54e+07	1.75e+07	-1.450	0.147	-5.98e+07	8934494
Constant	-2.78e+09	1.08e+09	-2.580	0.010	-4.88e+09	-6.68e+08

4.4.3 Effect of total public debt on gross capital formation

To examine the effect of total public debt on gross fixed capital formation, VAR model was estimated using total public debt. The findings are presented in table 4.6 indicate that all the four lag in total public debt negatively affects gross fixed capital formation. This shows that total debt comes with large burden on the country's development especially in so far as capital formation is concerned. Accumulation of large debt stock comes with reduced fiscal space which culminates into fiscal consolidation on both the recurrent and capital expenditures. The conclusion is that public debt has a negative effect on the gross capital formation in Kenya.

Table 4. 6: Estimation results for effect of total debt on Gross fixed capital formation

	Coef.	**Std.Err.**	**z**	**P>z**	**[95%Conf. Interval]**	
GFCF						
L1.	0.489	0.167	2.920	0.003	0.161	0.816

L2.	0.014	0.130	0.100	0.917	-0.241	0.268
L3.	0.568	0.150	3.780	0.468	0.273	0.862
L4.	-0.061	0.179	-0.340	0.734	-0.412	0.290
Total debt						
L1.	-384.013	771.578	-0.500	0.619	-1896.279	1128.253
L2.	-1271.805	1250.899	-1.020	0.309	-3723.522	1179.912
L3.	-3570.482	957.894	-3.730	0.468	1693.044	5447.920
L4.	-1059.364	809.988	-1.310	0.191	-2646.911	528.183
GDP per capital growth						
L1.	1.62e+08	4.07e+07	3.970	0.468	8.19e+07	2.42e+08
L2.	8.17e+07	4.51e+07	1.810	0.070	-6683306	1.70e+08
L3.	-8.16e+07	5.15e+07	-1.590	0.113	-1.82e+08	1.93e+07
L4.	4.52e+07	4.88e+07	0.930	0.354	-5.03e+07	1.41e+08
Foreign direct investments						
L1.	2.59e+08	1.28e+08	2.020	0.043	7843142	5.10e+08
L2.	-3.72e+07	1.26e+08	-0.290	0.768	-2.85e+08	2.10e+08
L3.	1.88e+08	1.33e+08	1.410	0.158	-7.32e+07	4.49e+08
L4.	-3.33e+08	1.34e+08	-2.490	0.013	-5.95e+08	-7.07e+07
Openness of the economy						
L1.	-1.33e+07	1.73e+07	-0.770	0.442	-4.73e+07	2.06e+07
L2.	3.11e+07	2.15e+07	1.450	0.147	-1.10e+07	7.33e+07
L3.	6899524	1.81e+07	0.380	0.703	-2.86e+07	4.24e+07
L4.	3.66e+07	1.66e+07	2.210	0.027	4075175	6.92e+07
Domestic savings						
L1.	-1043937	1.90e+07	-0.050	0.956	-3.83e+07	3.62e+07
L2.	4581655	2.06e+07	0.220	0.824	-3.58e+07	4.49e+07
L3.	-4.31e+07	2.12e+07	-2.030	0.042	-8.46e+07	-1559609
L4.	-1.66e+07	1.99e+07	-0.830	0.405	-5.56e+07	2.25e+07
Constant	-3.04e+09	1.26e+09	-2.420	0.015	-5.50e+09	-5.81e+08

In summary, study findings indicate that domestic, external and total public debt stock accumulation adversely affect the gross fixed capital formation. However, the negative effect of domestic and external effect comes with a lag. The findings are similar to Abdullah et al (2016) analysed impacted of debt on capital formation in Nigeria from1980 – 2013 period using the Autoregressive Distributed Lag model and found that external debt negatively affects gross capital formation. Similar findings are reported by Omodero (2019) who examined the relationship between debt financing and public capital investment in Nigeria for 1996 - 2018 period using the Ordinary least squares (OLS) regression. Results show that debt investment on capital is negatively affected. However, debt servicing costs incurred have a significantly affect capital investment negatively. Recommendations are that borrowed funds should be invested in profitable programmes to offset the negative effect the total debt has on capital formation in Nigeria.

Kenyan context, Ndoti and Korir (2018) adopting a longitudinal research design investigated how servicing debt affects capital formation and gross domestic product in Kenya. The findings show that lagged servicing of debt adversely affects capital formation. This is in concurrence with the study findings. In addition, Omodero (2019) examined link between debt financing and public capital investment in Nigeria for 1996 - 2018 period using the Ordinary least squares regression. Findings show that debt investment on capital is negatively affected. However, debt servicing costs incurred affect capital investment negatively. Recommendations are that borrowed funds be invested in profitable programmes to offset the negative effect the public debt has on capital formation in Nigeria.

Similarly, Akomolafe, et. al., (2015) in investigating how public borrowing affects private capital formation and investment in Nigeria considering debt decomposition into external debt and domestic debt using VECM found that private domestic investment is crowded out by public domestic debt, negatively affecting private capital formation. In addition, Abdullah, Bakar and Hassan (2016) modelled the debt overhang versus crowding out effects. Findings assert that almost all the economies tend to contend with the debt especially external debt. They assert that over the last 50 years, Sub Saharan African economies have faced negative consequences of debt as importantly external debt dampens capital formation among the Sub-Saharan African economies.

King'wara (2014) examined effect of domestic debt on private capital formation and investment from 1967 to 2007 period. Using a VAR model the findings indicate detrimental impact caused by increased borrowing on private capital formation and investment which is similar to the study's finding. Shabbir (2013) explored the relationship between capital formation debt in 70 developing countries between 1976 and 2011 period. The study found that high debt stocks lowers the space for fiscal policy to be applied affectively hence dampening the economic growth over time. This agrees with the findings of this study.

However, the study disagrees with the findings by Apere (2014) on the impact of domestic debt on private capital formation in Nigeria between 1981 and 2012 using the instrumental variable estimation procedure with bootstraps. Findings indicate that domestic debt has a positive linear outcome on private capital formation process.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS Error! Bookmark not defined.

5.1 Introduction

The study summary, conclusion, and recommendations are presented in this chapter. Specifically, the summary of findings following data analysis, inferences made from the summary findings, and policy recommendations

5.2 Summary of findings

The study findings indicate that there are varying effects of domestic debt on the gross fixed capital formation over various lags. The results indicate that a one year lag in domestic debt has a positive effect on the current year's gross fixed capital formation. Further, two year lag in domestic debt negatively affects the current year's gross fixed capital formation. Similar results are reported for third year lag in domestic debt. Lastly, the four year lag in domestic debt negatively affects the current year's gross fixed capital formation. The positive effect during the one year lag could imply that the amount borrowed could be invested in capital projects by the government hence the positive effect. However, the negative effect of the second, third and fourth year lag in domestic on the current year gross fixed capital formation could imply that as the debt becomes due for repayment, the government should set up some financial resources toward debt repayment that comprises of principal and interest.

Regarding external debt, the results indicate that a one year lag in domestic debt positively affects the current year's gross fixed capital formation. Further, two year lag in domestic debt was found to positively affect the current year's gross fixed capital formation. Similar results are reported for third year lag in domestic debt. However, the four year lag in domestic debt was found to negatively affect the current year's gross fixed capital formation. The positive effect during the one, two and three year lag could imply that the amount borrowed could be invested in capital projects by the government hence the positive effect. This is because majority of the external debts have medium term to long term maturity period. This implies that external loans take more time before they are due for repayment. In addition, such debts are mainly capital project funding oriented and therefore they are more likely to positively affect gross fixed capital formation. The negative effect on fourth year lag of external debt on gross fixed capital formation could imply into a scenario whereby external debt are falling due for payment from the fourth year hence the

government has to set aside some resources towards servicing of the external debt implying a negative effect on gross fixed capital formation.

The results on effect of the total public debt indicate that all the four lag in total public debt could indicate negative effect on gross fixed capital formation. It suggests that the total debt comes with large burden on the country's development in so far as capital formation is concerned. Accumulation of large debt stock comes with reduced fiscal space which culminates into fiscal consolidation on both the recurrent and capital expenditures. Therefore, the study concludes that public debt negatively affects the gross capital formation in Kenya.

5.3 Conclusions

The conclusion based on the study findings is that though debt financing is inevitable, it adversely affects the country's gross fixed capital formation through various channels. The key channel is the fiscal consolidation channel where accumulation of debt to a point of unsustainability leads to debt burden that therefore calls for fiscal consolidation measures. This occurs when the debt accumulated falls due and the government therefore has to set aside financial resources toward debt servicing. If a sizeable proportion of national income is directed towards debt servicing, this adversely affects gross fixed capital formation through reduced government expenditure in capital investment.

Further, increased domestic public debt is likely to affect the gross capital formation through the crowding out channels. With increased government domestic borrowing this my crowd out private sector credit either through the price or quantity channel. As a result, this affects the national gross fixed capital formation adversely through the negative effect it has on reduced contribution of the private sector in the capital formation process.

5.4 Recommendations

The study makes many recommendations based on the findings. The first is that the government should be keen on debt stock in the country. Debt sustainability has been at the center of discussion in the current times. Therefore, there is the need for the policy makers to ensure that debt levels are at sustainable levels to avoid the adverse effects the unsustainable debt levels, are likely to have on the economic macroeconomic fundamentals, capital formation being one of them. Further

is the need for the government to shy away from commercial loans and give preference to concessional loans that have lesser debt burden.

Secondly, the need for financial discipline in the execution of the budget. This is core in ensuring that borrowed funds are used for the intended purpose and not diverted into other uses. That is, the government should ensure that funds meant for capital infrastructural programme financing are not diverted to recurrent expenditure. This will ensure productivity of the borrowed funds and perhaps even have a positive effect on the gross capital formation process.

Thirdly, the government to ensure correct timing in borrowing. This will ensure that the government gets the debt at best terms possible especially when it comes to external borrowings. In addition, negotiation especially for external borrowing which attracts expenses such as foreign exchange losses. The negotiations should consider a fixed exchange rate with regard to external loan through hedging against the possible currency fluctuation. This will reduce the foreign exchange expense on the loan thus reducing the external debt burden on the gross fixed capital formation.

Lastly, the government to consider the size of the budget. It is evident that the Kenyan budget has been ambitious budget leading to large budget deficits that are warrant the appetite for borrowing. Therefore, during budget preparation the government should ensure that the budget realistic and in tandem with the country's growth rate and warranting to reasonable borrowing.

5.5 Recommendations for future research

The recommendation is that future studies should be conducted across various countries such as the sub – Saharan countries. This would allow a case for cross country analysis. There has been a discussion around debt burden among African economies as well as whether debt is good or bad for the African and least developed economies. Therefore, undertaking cross country analysis on the effect of bed on the gross fixed capital formation among the African states would contribute to this discussion.

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APPENDICES

Model 1

	Coef.	Std.Err.	z	P>z	[95%Conf.	Interval]
GFCF						
GFCF (-1)	0.486	0.163	2.980	0.003	0.166	0.807
GFCF (-2)	0.028	0.137	0.200	0.839	-0.240	0.296
GFCF (-3)	0.479	0.145	3.310	0.001	0.196	0.763
GFCF (-4)	0.085	0.182	0.470	0.641	-0.272	0.443
Domestic debt						
DD(-1)	1451.910	1252.959	1.160	0.247	-1003.844	3907.664
DD(-2)	-5080.255	1787.206	-2.840	0.004	-8583.114	-1577.396
DD(-3)	- 4526.930	1624.401	-2.790	0.005	1343.163	7710.698
DD(-4)	287.444	1463.039	0.200	0.844	-2580.060	3154.947
Gdp per capital growth						
GDPPCG(-1)	1.53e+08	4.25e+07	3.610	0.468	7.00e+07	2.37e+08
GDPPCG(-2)	1.01e+08	4.60e+07	2.200	0.028	1.10e+07	1.91e+08
GDPPCG(-3)	-8.59e+07	5.23e+07	-1.640	0.101	-1.88e+08	1.67e+07
GDPPCG(-4)	9.32e+07	4.59e+07	2.030	0.042	3279554	1.83e+08
Foreign direct investments						
FDI(-1)	2.24e+08	1.30e+08	1.720	0.085	-3.08e+07	4.79e+08
FDI(-2)	-1.18e+08	1.31e+08	-0.900	0.366	-3.74e+08	1.38e+08
FDI(-3)	3.99e+07	1.31e+08	0.300	0.761	-2.17e+08	2.96e+08
FDI(-4)	-4.93e+08	1.33e+08	-3.710	0.468	-7.54e+08	-2.32e+08
Openness of the economy						
OPECON(-1)	-5947375	1.86e+07	-0.320	0.750	-4.25e+07	3.06e+07
OPECON(-2)	4.35e+07	2.13e+07	2.040	0.041	1752273	8.51e+07
OPECON(-3)	8.45e+05	1.83e+07	0.050	0.963	-3.49e+07	3.66e+07
OPECON(-4)	4.04e+07	1.71e+07	2.360	0.018	6897545	7.40e+07
Domestic savings						
DS(-1)	-6115195	1.95e+07	-0.310	0.754	-4.44e+07	3.22e+07
DS(-2)	3740998	2.15e+07	0.170	0.862	-3.83e+07	4.58e+07
DS(-3)	-3.14e+07	2.17e+07	-1.450	0.147	-7.38e+07	1.11e+07
DS(-4)	-1.62e+07	2.04e+07	-0.790	0.427	-5.61e+07	2.38e+07
_cons	-3.76e+09	1.31e+09	-2.880	0.004	-6.32e+09	-1.20e+09
Domestic debt						
GFCF						
GFCF (-1)	- 0.468	0.468	-1.040	0.299	- 0.468	0.468
GFCF (-2)	0.468	0.468	0.760	0.447	- 0.468	0.468
GFCF (-3)	- 0.468	0.468	-0.380	0.703	- 0.468	0.468
GFCF (-4)	0.468	0.468	1.170	0.243	- 0.468	0.468
Domestic debt						
DD(-1)	0.878	0.163	5.390	0.468	0.559	1.197
DD(-2)	0.479	0.232	2.060	0.039	0.024	0.934
DD(-3)	-0.232	0.211	-1.100	0.271	-0.646	0.181
DD(-4)	-0.162	0.190	-0.850	0.394	-0.535	0.211

Gdp per capital growth						
GDPPCG(-1)	-6301.845	5520.513	-1.140	0.254	-1.71e+04	4518.161
GDPPCG(-2)	13898.530	5974.743	2.330	0.020	2188.253	25608.820
GDPPCG(-3)	-7993.966	6799.054	-1.180	0.240	-2.13e+04	5331.935
GDPPCG(-4)	-8650.681	5963.667	-1.450	0.147	-2.03e+04	3037.892
Foreign direct investments						
FDI(-1)	-8137.851	16902.500	-0.480	0.630	-4.13e+04	24990.440
FDI(-2)	31720.740	16970.310	1.870	0.062	-1540.446	64981.930
FDI(-3)	58261.120	16997.600	3.430	0.001	24946.430	91575.800
FDI(-4)	3045.251	17290.250	0.180	0.860	-3.08e+04	36933.520
Openness of the economy						
OPECON(-1)	-7406.009	2422.247	-3.060	0.002	-1.22e+04	-2658.491
OPECON(-2)	2437.788	2764.030	0.880	0.378	-2979.611	7855.187
OPECON(-3)	2348.283	2371.445	0.990	0.322	-2299.664	6996.230
OPECON(-4)	-2259.409	2222.876	-1.020	0.309	-6616.167	2097.348
Domestic savings						
DS(-1)	4743.952	2538.777	1.870	0.062	-231.961	9719.864
DS(-2)	-4760.908	2787.657	-1.710	0.088	-1.02e+04	702.798
DS(-3)	-2612.438	2814.165	-0.930	0.353	-8128.099	2903.224
DS(-4)	1039.119	2648.214	0.390	0.695	-4151.285	6229.524
_cons	285213	1.70e+05	1.680	0.093	-4.74e+04	6.18e+05
Gdp percapital growth						
gfcfuscurrent						
GFCF (-1)	0.468	0.468	2.020	0.044	0.468	0.468
GFCF (-2)	- 0.468	0.468	-1.330	0.184	- 0.468	0.468
GFCF (-3)	0.468	0.468	3.530	0.468	0.468	0.468
GFCF (-4)	- 0.468	0.468	-2.380	0.017	- 0.468	- 0.468
domesticdebt						
DD(-1)	- 0.468	0.468	-0.740	0.458	- 0.468	0.468
DD(-2)	0.468	0.468	1.810	0.071	- 0.468	0.468
DD(-3)	- 0.468	0.468	-2.160	0.031	- 0.468	- 0.468
DD(-4)	0.468	0.468	0.420	0.677	- 0.468	0.468
gdppercapitalgrowth						
GDPPCG(-1)	0.437	0.131	3.340	0.001	0.181	0.694
GDPPCG(-2)	-0.297	0.142	-2.100	0.036	-0.575	-0.020
GDPPCG(-3)	-0.014	0.161	-0.090	0.931	-0.330	0.302
GDPPCG(-4)	-0.605	0.141	-4.280	0.468	-0.882	-0.328
foreigndirectinvestments						
FDI(-1)	-1.305	0.400	-3.260	0.001	-2.090	-0.520
FDI(-2)	-0.302	0.402	-0.750	0.453	-1.090	0.486
FDI(-3)	0.568	0.403	1.410	0.158	-0.221	1.357
FDI(-4)	-1.371	0.410	-3.350	0.001	-2.174	-0.568
opennessoftheeconomy						
OPECON(-1)	0.069	0.057	1.200	0.232	-0.044	0.181

OPECON(-2)	-0.001	0.065	-0.010	0.989	-0.129	0.127
OPECON(-3)	-0.057	0.056	-1.010	0.313	-0.167	0.053
OPECON(-4)	0.012	0.053	0.240	0.814	-0.091	0.116
domesticsavings						
DS(-1)	0.115	0.060	1.920	0.055	-0.003	0.233
DS(-2)	-0.156	0.066	-2.360	0.018	-0.285	-0.027
DS(-3)	-0.034	0.067	-0.500	0.615	-0.164	0.097
DS(-4)	0.080	0.063	1.280	0.201	-0.043	0.203
_cons	-0.842	4.020	-0.210	0.834	-8.722	7.038
foreigndirectinvestments						
gfcfuscurrent						
FDI(-1)	- 0.468	0.468	-1.940	0.052	- 0.468	0.468
FDI(-2)	0.468	0.468	0.280	0.782	- 0.468	0.468
FDI(-3)	- 0.468	0.468	-0.620	0.533	- 0.468	0.468
FDI(-4)	0.468	0.468	3.990	0.468	0.468	0.468
domesticdebt						
DD(-1)	- 0.468	0.468	-1.240	0.213	- 0.468	0.468
DD(-2)	- 0.468	0.468	-2.150	0.032	- 0.468	- 0.468
DD(-3)	0.468	0.468	0.940	0.350	- 0.468	0.468
DD(-4)	0.468	0.468	2.980	0.003	0.468	0.468
gdppercapitalgrowth						
GDPPCG(-1)	0.067	0.052	1.290	0.198	-0.035	0.170
GDPPCG(-2)	0.124	0.057	2.180	0.029	0.013	0.235
GDPPCG(-3)	0.067	0.065	1.040	0.296	-0.059	0.194
GDPPCG(-4)	0.072	0.057	1.270	0.204	-0.039	0.183
foreigndirectinvestments						
FDI(-1)	-0.267	0.161	-1.660	0.097	-0.581	0.048
FDI(-2)	-0.345	0.161	-2.140	0.032	-0.661	-0.029
FDI(-3)	-0.555	0.161	-3.440	0.001	-0.872	-0.239
FDI(-4)	0.122	0.164	0.740	0.458	-0.200	0.444
opennessoftheeconomy						
OPECON(-1)	0.015	0.023	0.650	0.513	-0.030	0.060
OPECON(-2)	0.468	0.026	0.010	0.991	-0.051	0.052
OPECON(-3)	0.014	0.023	0.610	0.540	-0.030	0.058
OPECON(-4)	-0.007	0.021	-0.340	0.737	-0.048	0.034
domesticsavings						
DS(-1)	-0.020	0.024	-0.830	0.409	-0.067	0.027
DS(-2)	0.050	0.026	1.900	0.057	-0.002	0.102
DS(-3)	0.023	0.027	0.870	0.382	-0.029	0.076
DS(-4)	-0.038	0.025	-1.500	0.133	-0.087	0.012
_cons	-1.087	1.612	-0.670	0.500	-4.246	2.072
opennessoftheeconomy						
gfcfuscurrent						
FDI(-1)	- 0.468	0.468	-2.340	0.019	- 0.468	- 0.468
FDI(-2)	0.468	0.468	0.280	0.776	- 0.468	0.468

FDI(-3)	0.468	0.468	0.400	0.690	- 0.468	0.468
FDI(-4)	0.468	0.468	0.870	0.384	- 0.468	0.468
domesticdebt						
DD(-1)	- 0.468	0.468	-0.160	0.870	- 0.468	0.468
DD(-2)	- 0.468	0.468	-0.440	0.662	- 0.468	0.468
DD(-3)	- 0.468	0.468	-0.990	0.321	- 0.468	0.468
DD(-4)	0.468	0.468	2.320	0.020	0.468	0.468
gdppercapitalgrowth						
GDPPCG(-1)	0.148	0.383	0.390	0.699	-0.603	0.899
GDPPCG(-2)	-0.503	0.415	-1.210	0.225	-1.315	0.310
GDPPCG(-3)	0.398	0.472	0.840	0.399	-0.527	1.323
GDPPCG(-4)	1.230	0.414	2.970	0.003	0.419	2.041
foreigndirectinvestments						
FDI(-1)	2.746	1.173	2.340	0.019	0.446	5.045
FDI(-2)	-0.180	1.178	-0.150	0.878	-2.489	2.128
FDI(-3)	-2.671	1.180	-2.260	0.024	-4.983	-0.358
FDI(-4)	2.062	1.200	1.720	0.086	-0.290	4.413
opennessoftheeconomy						
OPECON(-1)	0.504	0.168	3.000	0.003	0.174	0.833
OPECON(-2)	0.090	0.192	0.470	0.640	-0.286	0.466
OPECON(-3)	-0.044	0.165	-0.270	0.790	-0.366	0.279
OPECON(-4)	-0.007	0.154	-0.050	0.962	-0.310	0.295
domesticsavings						
DS(-1)	-0.225	0.176	-1.280	0.202	-0.570	0.121
DS(-2)	0.355	0.193	1.830	0.067	-0.025	0.734
DS(-3)	0.013	0.195	0.070	0.948	-0.370	0.396
DS(-4)	-0.508	0.184	-2.760	0.006	-0.868	-0.148
_cons	32.734	11.776	2.780	0.005	9.653	55.815
domesticsavings						
gfcfuscurrent						
GFCF (-1)	0.148	0.383	0.390	0.699	-0.603	0.899
GFCF (-2)	-0.503	0.415	-1.210	0.225	-1.315	0.310
GFCF (-3)	0.398	0.472	0.840	0.399	-0.527	1.323
GFCF (-4)	1.230	0.414	2.970	0.003	0.419	2.041
domesticdebt						
DD(-1)	0.403	0.198	2.030	0.042	0.014	0.791
DD(-2)	0.217	0.218	1.000	0.319	-0.210	0.644
DD(-3)	-0.101	0.220	-0.460	0.647	-0.531	0.330
DD(-4)	-0.287	0.207	-1.390	0.165	-0.692	0.118
gdppercapitalgrowth						
GDPPCG(-1)	-0.681	0.431	-1.580	0.114	-1.526	0.164
GDPPCG(-2)	-0.069	0.467	-0.150	0.882	-0.984	0.845
GDPPCG(-3)	0.730	0.531	1.380	0.169	-0.311	1.771
GDPPCG(-4)	0.545	0.466	1.170	0.242	-0.368	1.458

foreigndirectinvestments						
FDI(-1)	0.692	1.320	0.520	0.600	-1.896	3.279
FDI(-2)	-1.735	1.325	-1.310	0.191	-4.333	0.863
FDI(-3)	-0.191	1.328	-0.140	0.885	-2.794	2.411
FDI(-4)	1.833	1.350	1.360	0.175	-0.814	4.480
opennessoftheeconomy						
OPECON(-1)	0.066	0.189	0.350	0.725	-0.304	0.437
OPECON(-2)	0.093	0.216	0.430	0.666	-0.330	0.516
OPECON(-3)	0.017	0.185	0.090	0.927	-0.346	0.380
OPECON(-4)	0.179	0.174	1.030	0.303	-0.162	0.519
domesticsavings						
DS(-1)	0.403	0.198	2.030	0.042	0.014	0.791
DS(-2)	0.217	0.218	1.000	0.319	-0.210	0.644
DS(-3)	-0.101	0.220	-0.460	0.647	-0.531	0.330
DS(-4)	-0.287	0.207	-1.390	0.165	-0.692	0.118
_cons	-3.599	13.253	-0.270	0.786	-29.575	22.377

Model 2

	Coef.	Std.Err.	z	P>z	[95%Conf.	Interval]
gfcfuscurrent						
gfcfuscurrent						
GFCF (-1)	0.423	0.167	2.540	0.011	0.096	0.749
GFCF (-2)	0.063	0.141	0.440	0.657	-0.214	0.339
GFCF (-3)	0.694	0.141	4.910	0.468	0.417	0.971
GFCF (-4)	-0.208	0.147	-1.410	0.157	-0.497	0.080
externaldebt						
ED(-1)	-2803.800	1453.648	-1.930	0.054	-5652.898	45.298
ED(-2)	626.990	2780.258	0.230	0.822	-4822.217	6076.196
ED(-3)	7135.453	2375.927	3.000	0.003	2478.722	11792.180
ED(-4)	-2764.731	1658.587	-1.670	0.096	-6015.501	486.039
gdppercapitalgrowth						
GDPPCG(-1)	1.75e+08	3.57e+07	4.910	0.468	1.05e+08	2.46e+08
GDPPCG(-2)	7.18e+07	3.98e+07	1.810	0.071	-6163586	1.50e+08
GDPPCG(-3)	-6.56e+07	4.50e+07	-1.460	0.145	-1.54e+08	2.26e+07
GDPPCG(-4)	-1.48e+07	4.20e+07	-0.350	0.725	-9.71e+07	6.76e+07
foreigndirectinvestments						
FDI(-1)	2.53e+08	1.13e+08	2.240	0.025	3.18e+07	4.74e+08
FDI(-2)	3.56e+07	1.08e+08	0.330	0.741	-1.75e+08	2.47e+08
FDI(-3)	3.07e+08	1.12e+08	2.760	0.006	8.89e+07	5.26e+08
FDI(-4)	-1.96e+08	1.12e+08	-1.760	0.078	-4.15e+08	2.21e+07
opennessoftheeconomy						
OPECON(-1)	-5884966	1.44e+07	-0.410	0.684	-3.42e+07	2.24e+07

OPECON(-2)	1.37e+07	1.84e+07	0.750	0.454	-2.23e+07	4.97e+07
OPECON(-3)	1.25e+07	1.67e+07	0.750	0.455	-2.02e+07	4.52e+07
OPECON(-4)	3.54e+07	1.43e+07	2.470	0.013	7339451	6.36e+07
domesticsavings						
DS(-1)	-1027209	1.60e+07	-0.060	0.949	-3.24e+07	3.03e+07
DS(-2)	7273452	1.75e+07	0.410	0.679	-2.71e+07	4.17e+07
DS(-3)	-5.33e+07	1.85e+07	-2.890	0.004	-8.95e+07	-1.71e+07
DS(-4)	-2.54e+07	1.75e+07	-1.450	0.147	-5.98e+07	8934494
_cons	-2.78e+09	1.08e+09	-2.580	0.010	-4.88e+09	-6.68e+08
externaldebt						
gfcfuscurrent						
GFCF (-1)	0.066	0.189	0.350	0.725	-0.304	0.437
GFCF (-2)	0.093	0.216	0.430	0.666	-0.330	0.516
GFCF (-3)	0.017	0.185	0.090	0.927	-0.346	0.380
GFCF (-4)	0.179	0.174	1.030	0.303	-0.162	0.519
externaldebt						
ED(-1)	1.496	0.176	8.510	0.468	1.152	1.841
ED(-2)	-0.541	0.336	-1.610	0.107	-1.200	0.118
ED(-3)	0.562	0.287	1.960	0.050	-0.001	1.125
ED(-4)	-0.488	0.201	-2.430	0.015	-0.881	-0.095
gdppercapitalgrowth						
GDPPCG(-1)	-2390.745	4320.662	-0.550	0.580	-1.09e+04	6077.598
GDPPCG(-2)	3767.723	4811.780	0.780	0.434	-5663.192	13198.640
GDPPCG(-3)	-1.87e+04	5442.492	-3.440	0.001	-2.94e+04	-8047.120
GDPPCG(-4)	-2853.287	5082.512	-0.560	0.575	-1.28e+04	7108.254
foreigndirectinvestments						
FDI(-1)	30290.540	13655.050	2.220	0.027	3527.137	57053.940
FDI(-2)	46120.120	13019.040	3.540	0.468	20603.260	71636.970
FDI(-3)	58522.840	13488.910	4.340	0.468	32085.060	84960.610
FDI(-4)	39721.700	13486.590	2.950	0.003	13288.460	66154.930
opennessoftheeconomy						
OPECON(-1)	-8059.575	1746.904	-4.610	0.468	-1.15e+04	-4635.706
OPECON(-2)	2898.586	2221.416	1.300	0.192	-1455.310	7252.482
OPECON(-3)	-1652.146	2017.727	-0.820	0.413	-5606.817	2302.526
OPECON(-4)	-1833.456	1734.417	-1.060	0.290	-5232.851	1565.939
domesticsavings						
DS(-1)	3198.846	1935.517	1.650	0.098	-594.697	6992.389
DS(-2)	-2345.759	2122.420	-1.110	0.269	-6505.625	1814.108
DS(-3)	-5376.753	2234.431	-2.410	0.016	-9756.156	-997.349
DS(-4)	1963.570	2121.466	0.930	0.355	-2194.426	6121.567
_cons	4.68e+05	1.30e+05	3.600	0.468	2.13e+05	7.23e+05
gdppercapitalgrowth						
gfcfuscurrent						
GFCF (-1)	0.066	0.189	0.350	0.725	-0.304	0.437
GFCF (-2)	0.093	0.216	0.430	0.666	-0.330	0.516

GFCF (-3)	0.017	0.185	0.090	0.927	-0.346	0.380
GFCF (-4)	0.179	0.174	1.030	0.303	-0.162	0.519
externaldebt						
ED(-1)	0.071	0.051	1.400	0.160	-0.028	0.171
ED(-2)	-0.097	0.064	-1.510	0.132	-0.224	0.029
ED(-3)	0.037	0.059	0.640	0.524	-0.077	0.152
ED(-4)	-0.017	0.050	-0.330	0.738	-0.116	0.082
gdppercapitalgrowth						
GDPPCG(-1)	0.256	0.125	2.040	0.041	0.010	0.502
GDPPCG(-2)	-0.284	0.140	-2.040	0.042	-0.558	-0.011
GDPPCG(-3)	0.131	0.158	0.830	0.407	-0.179	0.441
GDPPCG(-4)	-0.801	0.148	-5.430	0.468	-1.090	-0.512
foreigndirectinvestments						
FDI(-1)	-1.614	0.396	-4.070	0.468	-2.391	-0.837
FDI(-2)	-0.651	0.378	-1.720	0.085	-1.392	0.089
FDI(-3)	1.069	0.392	2.730	0.006	0.302	1.837
FDI(-4)	-1.091	0.392	-2.790	0.005	-1.859	-0.324
opennessoftheeconomy						
OPECON(-1)	0.071	0.051	1.400	0.160	-0.028	0.171
OPECON(-2)	-0.097	0.064	-1.510	0.132	-0.224	0.029
OPECON(-3)	0.037	0.059	0.640	0.524	-0.077	0.152
OPECON(-4)	-0.017	0.050	-0.330	0.738	-0.116	0.082
domesticsavings						
DS(-1)	0.166	0.056	2.950	0.003	0.056	0.276
DS(-2)	-0.100	0.062	-1.620	0.105	-0.221	0.021
DS(-3)	-0.145	0.065	-2.230	0.026	-0.272	-0.018
DS(-4)	0.098	0.062	1.590	0.111	-0.023	0.219
_cons	2.321	3.776	0.610	0.539	-5.081	9.722
foreigndirectinvestments						
gfcfuscurrent						
GFCF (-1)	0.071	0.051	1.400	0.160	-0.028	0.171
GFCF (-2)	-0.097	0.064	-1.510	0.132	-0.224	0.029
GFCF (-3)	0.037	0.059	0.640	0.524	-0.077	0.152
GFCF (-4)	-0.017	0.050	-0.330	0.738	-0.116	0.082
externaldebt						
ED(-1)	0.003	0.020	0.150	0.879	-0.036	0.042
ED(-2)	0.038	0.022	1.740	0.083	-0.005	0.080
ED(-3)	0.023	0.023	1.030	0.304	-0.021	0.068
ED(-4)	-0.067	0.022	-3.090	0.002	-0.109	-0.024
gdppercapitalgrowth						
GDPPCG(-1)	0.071	0.044	1.620	0.105	-0.015	0.158
GDPPCG(-2)	0.177	0.049	3.620	0.468	0.081	0.273
GDPPCG(-3)	0.132	0.055	2.390	0.017	0.024	0.241
GDPPCG(-4)	-0.037	0.052	-0.720	0.473	-0.139	0.064

foreigndirectinvestments						
FDI(-1)	-0.465	0.139	-3.340	0.001	-0.738	-0.192
FDI(-2)	-0.272	0.133	-2.050	0.040	-0.532	-0.012
FDI(-3)	-0.463	0.138	-3.370	0.001	-0.733	-0.194
FDI(-4)	0.220	0.137	1.600	0.109	-0.049	0.490
opennessoftheeconomy						
OPECON(-1)	0.007	0.018	0.380	0.708	-0.028	0.042
OPECON(-2)	-0.013	0.023	-0.570	0.566	-0.057	0.031
OPECON(-3)	0.048	0.021	2.330	0.020	0.008	0.088
OPECON(-4)	-0.009	0.018	-0.510	0.612	-0.044	0.026
domesticsavings						
DS(-1)	0.003	0.020	0.150	0.879	-0.036	0.042
DS(-2)	0.038	0.022	1.740	0.083	-0.005	0.080
DS(-3)	0.023	0.023	1.030	0.304	-0.021	0.068
DS(-4)	-0.067	0.022	-3.090	0.002	-0.109	-0.024
_cons	-2.627	1.326	-1.980	0.048	-5.226	-0.028
opennessoftheeconomy						
gfcfuscurrent						
GFCF (-1)	0.003	0.020	0.150	0.879	-0.036	0.042
GFCF (-2)	0.038	0.022	1.740	0.083	-0.005	0.080
GFCF (-3)	0.023	0.023	1.030	0.304	-0.021	0.068
GFCF (-4)	-0.067	0.022	-3.090	0.002	-0.109	-0.024
externaldebt						
ED(-1)	0.007	0.018	0.380	0.708	-0.028	0.042
ED(-2)	-0.013	0.023	-0.570	0.566	-0.057	0.031
ED(-3)	0.048	0.021	2.330	0.020	0.008	0.088
ED(-4)	-0.009	0.018	-0.510	0.612	-0.044	0.026
gdppercapitalgrowth						
GDPPCG(-1)	-0.020	0.379	-0.050	0.958	-0.763	0.723
GDPPCG(-2)	-0.243	0.422	-0.570	0.566	-1.070	0.585
GDPPCG(-3)	0.767	0.478	1.610	0.108	-0.170	1.703
GDPPCG(-4)	0.760	0.446	1.700	0.088	-0.114	1.634
foreigndirectinvestments						
FDI(-1)	1.751	1.198	1.460	0.144	-0.598	4.099
FDI(-2)	-0.396	1.142	-0.350	0.729	-2.636	1.843
FDI(-3)	-1.952	1.184	-1.650	0.099	-4.273	0.368
FDI(-4)	2.591	1.184	2.190	0.029	0.272	4.911
opennessoftheeconomy						
OPECON(-1)	0.496	0.153	3.230	0.001	0.195	0.796
OPECON(-2)	-0.002	0.195	-0.010	0.993	-0.384	0.380
OPECON(-3)	0.173	0.177	0.980	0.327	-0.174	0.520
OPECON(-4)	-0.054	0.152	-0.350	0.723	-0.352	0.244
domesticsavings						
DS(-1)	-0.127	0.170	-0.750	0.454	-0.460	0.206
DS(-2)	0.324	0.186	1.740	0.082	-0.041	0.689

DS(-3)	-0.110	0.196	-0.560	0.574	-0.495	0.274
DS(-4)	-0.561	0.186	-3.010	0.003	-0.926	-0.196
_cons	26.698	11.416	2.340	0.019	4.322	49.073
domesticsavings						
gfcfuscurrent						
GFCF (-1)	1.751	1.198	1.460	0.144	-0.598	4.099
GFCF (-2)	-0.396	1.142	-0.350	0.729	-2.636	1.843
GFCF (-3)	-1.952	1.184	-1.650	0.099	-4.273	0.368
GFCF (-4)	2.591	1.184	2.190	0.029	0.272	4.911
externaldebt						
ED(-1)	0.007	0.018	0.380	0.708	-0.028	0.042
ED(-2)	-0.013	0.023	-0.570	0.566	-0.057	0.031
ED(-3)	0.048	0.021	2.330	0.020	0.008	0.088
ED(-4)	-0.009	0.018	-0.510	0.612	-0.044	0.026
gdppercapitalgrowth						
GDPPCG(-1)	-0.469	0.430	-1.090	0.275	-1.311	0.373
GDPPCG(-2)	0.318	0.478	0.670	0.506	-0.619	1.256
GDPPCG(-3)	1.302	0.541	2.410	0.016	0.241	2.363
GDPPCG(-4)	-0.049	0.505	-0.100	0.922	-1.040	0.941
foreigndirectinvestments						
FDI(-1)	-0.572	1.358	-0.420	0.674	-3.233	2.090
FDI(-2)	-1.061	1.294	-0.820	0.412	-3.598	1.476
FDI(-3)	0.434	1.341	0.320	0.746	-2.195	3.062
FDI(-4)	2.373	1.341	1.770	0.077	-0.256	5.001
opennessoftheeconomy						
OPECON(-1)	0.088	0.174	0.510	0.613	-0.253	0.428
OPECON(-2)	-0.145	0.221	-0.660	0.510	-0.578	0.288
OPECON(-3)	0.165	0.201	0.820	0.409	-0.228	0.559
OPECON(-4)	0.194	0.172	1.130	0.260	-0.144	0.532
domesticsavings						
DS(-1)	0.595	0.192	3.090	0.002	0.218	0.972
DS(-2)	0.179	0.211	0.850	0.396	-0.235	0.593
DS(-3)	-0.076	0.222	-0.340	0.731	-0.512	0.359
DS(-4)	-0.457	0.211	-2.170	0.030	-0.871	-0.044
_cons	-5.781	12.935	-0.450	0.655	-31.133	19.571

Model 3

	Coef.	Std.Err.	z	P>z	[95%Conf.	Interval]
gfcfuscurrent						
gfcfuscurrent						
GFCF (-1)	0.489	0.167	2.920	0.003	0.161	0.816
GFCF (-2)	0.014	0.130	0.100	0.917	-0.241	0.268
GFCF (-3)	0.568	0.150	3.780	0.468	0.273	0.862
GFCF (-4)	-0.061	0.179	-0.340	0.734	-0.412	0.290
totaldebt						
TD(-1)	-384.013	771.578	-0.500	0.619	-1896.279	1128.253
TD(-2)	-1271.805	1250.899	-1.020	0.309	-3723.522	1179.912
TD(-3)	3570.482	957.894	3.730	0.468	1693.044	5447.920
TD(-4)	-1059.364	809.988	-1.310	0.191	-2646.911	528.183
gdppercapitalgrowth						
GDPPCG(-1)	1.62e+08	4.07e+07	3.970	0.468	8.19e+07	2.42e+08
GDPPCG(-2)	8.17e+07	4.51e+07	1.810	0.070	-6683306	1.70e+08
GDPPCG(-3)	-8.16e+07	5.15e+07	-1.590	0.113	-1.82e+08	1.93e+07
GDPPCG(-4)	4.52e+07	4.88e+07	0.930	0.354	-5.03e+07	1.41e+08
foreigndirectinvestments						
FDI(-1)	2.59e+08	1.28e+08	2.020	0.043	7843142	5.10e+08
FDI(-2)	-3.72e+07	1.26e+08	-0.290	0.768	-2.85e+08	2.10e+08
FDI(-3)	1.88e+08	1.33e+08	1.410	0.158	-7.32e+07	4.49e+08
FDI(-4)	-3.33e+08	1.34e+08	-2.490	0.013	-5.95e+08	-7.07e+07
opennessoftheeconomy						
OPECON(-1)	-1.33e+07	1.73e+07	-0.770	0.442	-4.73e+07	2.06e+07
OPECON(-2)	3.11e+07	2.15e+07	1.450	0.147	-1.10e+07	7.33e+07
OPECON(-3)	6899524	1.81e+07	0.380	0.703	-2.86e+07	4.24e+07
OPECON(-4)	3.66e+07	1.66e+07	2.210	0.027	4075175	6.92e+07
domesticsavings						
DS(-1)	-1043937	1.90e+07	-0.050	0.956	-3.83e+07	3.62e+07
DS(-2)	4581655	2.06e+07	0.220	0.824	-3.58e+07	4.49e+07
DS(-3)	-4.31e+07	2.12e+07	-2.030	0.042	-8.46e+07	-1559609
DS(-4)	-1.66e+07	1.99e+07	-0.830	0.405	-5.56e+07	2.25e+07
_cons	-3.04e+09	1.26e+09	-2.420	0.015	-5.50e+09	-5.81e+08
totaldebt						
gfcfuscurrent						
GFCF (-1)	1.751	1.198	1.460	0.144	-0.598	4.099
GFCF (-2)	-0.396	1.142	-0.350	0.729	-2.636	1.843
GFCF (-3)	-1.952	1.184	-1.650	0.099	-4.273	0.368
GFCF (-4)	2.591	1.184	2.190	0.029	0.272	4.911
totaldebt						

TD(-1)	1.215	0.167	7.290	0.468	0.889	1.542
TD(-2)	0.065	0.270	0.240	0.810	-0.465	0.595
TD(-3)	-0.073	0.207	-0.350	0.725	-0.478	0.333
TD(-4)	-0.271	0.175	-1.550	0.122	-0.614	0.072
gdppercapitalgrowth						
GDPPCG(-1)	-1.37e+04	8794.876	-1.560	0.120	-3.09e+04	3553.469
GDPPCG(-2)	18571.720	9735.625	1.910	0.056	-509.755	37653.190
GDPPCG(-3)	-2.77e+04	11115.250	-2.500	0.013	-4.95e+04	-5961.487
GDPPCG(-4)	-8688.329	10532.300	-0.820	0.409	-2.93e+04	11954.600
foreigndirectinvestments						
FDI(-1)	20074.460	27683.110	0.730	0.468	-3.42e+04	74332.360
FDI(-2)	64230.620	27257.690	2.360	0.018	10806.520	1.18e+05
FDI(-3)	1.09e+05	28757.750	3.800	0.468	53001.320	1.66e+05
FDI(-4)	26730.220	28902.770	0.920	0.355	-2.99e+04	83378.600
opennessoftheeconomy						
OPECON(-1)	-1.45e+04	3740.797	-3.870	0.468	-2.18e+04	-7137.201
OPECON(-2)	6543.520	4640.983	1.410	0.159	-2552.640	15639.680
OPECON(-3)	1839.797	3911.508	0.470	0.638	-5826.618	9506.213
OPECON(-4)	-4612.927	3588.517	-1.290	0.199	-1.16e+04	2420.436
domesticsavings						
DS(-1)	7276.762	4107.007	1.770	0.076	-772.824	15326.350
DS(-2)	-6894.883	4448.526	-1.550	0.121	-1.56e+04	1824.068
DS(-3)	-8676.564	4575.602	-1.900	0.058	-1.76e+04	291.452
DS(-4)	3664.753	4304.207	0.850	0.395	-4771.337	12100.840
_cons	6.53e+05	271212	2.410	0.016	1.21e+05	1184379
gdppercapitalgrowth						
gfcfuscurrent						
GFCF (-1)	1.215	0.167	7.290	0.468	0.889	1.542
GFCF (-2)	0.065	0.270	0.240	0.810	-0.465	0.595
GFCF (-3)	-0.073	0.207	-0.350	0.725	-0.478	0.333
GFCF (-4)	-0.271	0.175	-1.550	0.122	-0.614	0.072
totaldebt						
TD(-1)	0.149	0.059	2.550	0.011	0.034	0.264
TD(-2)	-0.139	0.063	-2.200	0.028	-0.263	-0.015
TD(-3)	-0.088	0.065	-1.360	0.175	-0.216	0.039
TD(-4)	0.090	0.061	1.470	0.141	-0.030	0.210
gdppercapitalgrowth						
GDPPCG(-1)	0.391	0.125	3.120	0.002	0.146	0.637
GDPPCG(-2)	-0.313	0.139	-2.260	0.024	-0.585	-0.042
GDPPCG(-3)	0.059	0.158	0.370	0.710	-0.251	0.369
GDPPCG(-4)	-0.743	0.150	-4.950	0.468	-1.037	-0.449
Foreign direct investments						
FDI(-1)	-1.393	0.394	-3.530	0.468	-2.166	-0.620
FDI(-2)	-0.308	0.388	-0.790	0.428	-1.069	0.453
FDI(-3)	0.959	0.410	2.340	0.019	0.156	1.762

FDI(-4)	-1.054	0.412	-2.560	0.010	-1.861	-0.247
opennessoftheeconomy						
OPECON(-1)	0.056	0.053	1.050	0.295	-0.049	0.160
OPECON(-2)	-0.058	0.066	-0.880	0.381	-0.188	0.072
OPECON(-3)	-0.012	0.056	-0.210	0.834	-0.121	0.098
OPECON(-4)	-0.006	0.051	-0.120	0.902	-0.106	0.094
domesticsavings						
DS(-1)	0.149	0.059	2.550	0.011	0.034	0.264
DS(-2)	-0.139	0.063	-2.200	0.028	-0.263	-0.015
DS(-3)	-0.088	0.065	-1.360	0.175	-0.216	0.039
DS(-4)	0.090	0.061	1.470	0.141	-0.030	0.210
_cons	1.622	3.863	0.420	0.675	-5.950	9.194
foreigndirectinvestments						
gfcfuscurrent						
GFCF (-1)	0.391	0.125	3.120	0.002	0.146	0.637
GFCF (-2)	-0.313	0.139	-2.260	0.024	-0.585	-0.042
GFCF (-3)	0.059	0.158	0.370	0.710	-0.251	0.369
GFCF (-4)	-0.743	0.150	-4.950	0.468	-1.037	-0.449
totaldebt						
TD(-1)	0.149	0.059	2.550	0.011	0.034	0.264
TD(-2)	-0.139	0.063	-2.200	0.028	-0.263	-0.015
TD(-3)	-0.088	0.065	-1.360	0.175	-0.216	0.039
TD(-4)	0.090	0.061	1.470	0.141	-0.030	0.210
gdppercapitalgrowth						
GDPPCG(-1)	0.076	0.048	1.590	0.112	-0.018	0.170
GDPPCG(-2)	0.144	0.053	2.700	0.007	0.040	0.248
GDPPCG(-3)	0.093	0.061	1.530	0.127	-0.026	0.212
GDPPCG(-4)	0.027	0.058	0.470	0.638	-0.086	0.140
foreigndirectinvestments						
FDI(-1)	-0.352	0.151	-2.330	0.020	-0.648	-0.055
FDI(-2)	-0.298	0.149	-2.000	0.045	-0.590	-0.006
FDI(-3)	-0.533	0.157	-3.400	0.001	-0.841	-0.225
FDI(-4)	0.164	0.158	1.040	0.299	-0.146	0.473
opennessoftheeconomy						
OPECON(-1)	0.006	0.020	0.280	0.777	-0.034	0.046
OPECON(-2)	-0.004	0.025	-0.160	0.877	-0.054	0.046
OPECON(-3)	0.025	0.021	1.170	0.240	-0.017	0.067
OPECON(-4)	-0.007	0.020	-0.350	0.730	-0.045	0.032
domesticsavings						
DS(-1)	-0.007	0.022	-0.320	0.746	-0.051	0.037
DS(-2)	0.044	0.024	1.800	0.071	-0.004	0.091
DS(-3)	0.029	0.025	1.160	0.246	-0.020	0.078
DS(-4)	-0.051	0.023	-2.180	0.030	-0.097	-0.005
_cons	-1.513	1.481	-1.020	0.307	-4.415	1.389

opennessoftheeconomy						
gfcfuscurrent						
GFCF (-1)	-0.352	0.151	-2.330	0.020	-0.648	-0.055
GFCF (-2)	-0.298	0.149	-2.000	0.045	-0.590	-0.006
GFCF (-3)	-0.533	0.157	-3.400	0.001	-0.841	-0.225
GFCF (-4)	0.164	0.158	1.040	0.299	-0.146	0.473
totaldebt						
TD(-1)	0.391	0.125	3.120	0.002	0.146	0.637
TD(-2)	-0.313	0.139	-2.260	0.024	-0.585	-0.042
TD(-3)	0.059	0.158	0.370	0.710	-0.251	0.369
TD(-4)	-0.743	0.150	-4.950	0.468	-1.037	-0.449
gdppercapitalgrowth						
GDPPCG(-1)	0.147	0.375	0.390	0.695	-0.587	0.881
GDPPCG(-2)	-0.401	0.415	-0.970	0.334	-1.213	0.412
GDPPCG(-3)	0.563	0.473	1.190	0.235	-0.365	1.490
GDPPCG(-4)	1.010	0.449	2.250	0.024	0.131	1.889
foreigndirectinvestments						
FDI(-1)	2.338	1.179	1.980	0.047	0.027	4.649
FDI(-2)	-0.081	1.161	-0.070	0.944	-2.357	2.194
FDI(-3)	-2.336	1.225	-1.910	0.056	-4.737	0.064
FDI(-4)	2.410	1.231	1.960	0.050	-0.002	4.823
opennessoftheeconomy						
OPECON(-1)	0.473	0.159	2.970	0.003	0.161	0.786
OPECON(-2)	0.043	0.198	0.220	0.826	-0.344	0.431
OPECON(-3)	0.034	0.167	0.200	0.840	-0.293	0.360
OPECON(-4)	-0.022	0.153	-0.140	0.885	-0.322	0.277
domesticsavings						
DS(-1)	-0.164	0.175	-0.940	0.349	-0.507	0.179
DS(-2)	0.330	0.189	1.740	0.081	-0.041	0.702
DS(-3)	-0.015	0.195	-0.080	0.938	-0.397	0.367
DS(-4)	-0.538	0.183	-2.930	0.003	-0.897	-0.178
_cons	31.557	11.551	2.730	0.006	8.918	54.196
domesticsavings						
gfcfuscurrent						
GFCF (-1)	-0.352	0.151	-2.330	0.020	-0.648	-0.055
GFCF (-2)	-0.298	0.149	-2.000	0.045	-0.590	-0.006
GFCF (-3)	-0.533	0.157	-3.400	0.001	-0.841	-0.225
GFCF (-4)	0.164	0.158	1.040	0.299	-0.146	0.473
Total debt						
TD(-1)	-0.164	0.175	-0.940	0.349	-0.507	0.179
TD(-2)	0.330	0.189	1.740	0.081	-0.041	0.702
TD(-3)	-0.015	0.195	-0.080	0.938	-0.397	0.367
TD(-4)	-0.538	0.183	-2.930	0.003	-0.897	-0.178
Gdp per capital growth						
GDPPCG(-1)	-0.544	0.434	-1.250	0.210	-1.394	0.307

GDPPCG(-2)	-0.008	0.480	-0.020	0.987	-0.949	0.934
GDPPCG(-3)	0.897	0.548	1.640	0.102	-0.178	1.972
GDPPCG(-4)	0.320	0.520	0.620	0.538	-0.698	1.339
Foreign direct investments						
FDI(-1)	0.327	1.366	0.240	0.811	-2.350	3.004
FDI(-2)	-1.363	1.345	-1.010	0.311	-3.999	1.274
FDI(-3)	-0.039	1.419	-0.030	0.978	-2.820	2.742
FDI(-4)	2.068	1.426	1.450	0.147	-0.727	4.863
Openness of the economy						
OPECON(-1)	0.064	0.185	0.340	0.731	-0.298	0.425
OPECON(-2)	- 0.468	0.229	0.468	0.999	-0.449	0.449
OPECON(-3)	0.034	0.193	0.170	0.861	-0.345	0.412
OPECON(-4)	0.189	0.177	1.070	0.285	-0.158	0.536
Domestic savings						
DS(-1)	0.473	0.203	2.330	0.020	0.075	0.870
DS(-2)	0.210	0.219	0.960	0.339	-0.220	0.640
DS(-3)	-0.064	0.226	-0.280	0.778	-0.506	0.379
DS(-4)	-0.352	0.212	-1.660	0.097	-0.768	0.064
Constant	-1.484	13.382	-0.110	0.912	-27.713	24.744