



The Relationship Between Public Investment To GDP Ratio And External Debt Stocks In Kenya

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ABSTRACT: *Debt is a two-edged sword. External borrowing for productive investment is associated with macroeconomics stability, increased domestic savings, improved welfare and enhanced debt repayment ability; while over accumulation of debt is associated with increased repayment and debt-service costs, depressed domestic investment, crowding out of private investment and increased vulnerability to debt crisis. The paper sought to establish the relationship between public investment to GDP ratio and external debt in Kenya over the period of 1972-2012. The study used time-series data for public investment, GDP, and external debt from IMF International Financial Statistics database. All data was evaluated, cross-checked, compared and critically analyzed. To ensure that the data does not violate the assumptions of classical linear regression model (CLRM) and test for stationarity, the study tested for unit tests using Augmented Dickey-Fuller (ADF). To test for the verifiability of the estimated long run model, additional diagnostic tests, notably: heteroskedasticity, autoregressive conditional heteroskedasticity (ARCH), autocorrelation and normality, were carried out before regression was used to determine the relationship between external debt and inflation. The gauge the relationship between the external debt and growth in Kenya, a simple open macroeconomic debt growth model will be applied. Regression analysis of Ordinary Least Squares (OLS) will be used to determine the relationship between public investment to GDP ratio and external debt over the 1972 and 2012 period in Kenya. The correlation findings indicated a Spearman's correlation coefficient of -0.5618 with a P value of 0.0001, implying a negative and significant correlation. The regression results show an R square of 0.0067 indicating that 0.7 percent of variations in external debt are explained by variations in total investment/GDP ratio, F statistic of 0.26 and a p value of 0.1828. The study recommends sustaining lower inflation rates through tight fiscal and monetary policies, financing of budget deficit from non-inflationary sources, implementation of price stabilization program by subsidizing basic food items, and effectively managing external debt.*

Keywords: *External debt, Public Investment, Gross Domestic Product, Public Expenditure.*

1.0. INTRODUCTION

Developing countries have been the subject of frequent debt crises characterized by low credit ratings and high sovereign spreads (Balassone *et al.*, 2010). Increased borrowing to fund development projects is attributed to the inability to raise adequate revenue through taxation (Baldacci, Gupta, & Granados, 2009; Nautet & Meensel, 2012). The process of capital formation and industrialisation require heavy investments in infrastructure like roads, railway lines, irrigation channels and power houses. Speedy industrialisation also necessitates heavy import of capital goods such as machinery and equipments and technical know-how from abroad (Nelasco, 2012). External borrowing is seen as a desirable and an indispensable tool that supplements domestic revenue, funds productive activities, and accelerates economic growth and prosperity (Checherita & Rother, 2010; Nelasco, 2012).

External borrowing for productive investment, creates macroeconomics stability (Amaoko-Adu, 2002), increases domestic savings, improves welfare and enhances growth (Karagol, 2002; Cecchetti & Zampolli, 2011), but when external debt accumulates; repayment and debt-service costs depress domestic investment. Further, debt obligations lead to crowding-out effect that dries capital that should have been invested in the economy (Karagol, 2002). Debt to GDP ratios are used to measure the ability of a country to pay back its debt by comparing what it produces to what it owes to other states. There is no ideal debt to GDP ratio; however, a country is considered stable when it is in a position to comfortably serve its foreign debt without harming its economic growth. When a country has a high debt to GDP ratio, it experiences difficulties refinancing its debt, the reverse is also true. When the ratio goes higher, the creditors often hike their interest rates for the borrowing country. If



there is a default in repayment of foreign debts, then panic is created in the international markets. When the ratio is high, then the default rate is also high. Foreign lenders, therefore, seem to shy away from those states with higher debt to GDP ratio, unless certain moderating conditions are introduced (Rogoff et al., 2009).

It is assumed by many academics and policymakers that both public and private investment plays a major role in accelerating economic growth in developing countries. Public investment in infrastructure and human capital is associated with increase in productivity of private capital and economic growth. On the other hand, it is also argued that it has the potential of crowding out private investment and negatively affecting growth. Therefore, the level of both public and private investment is an important issue of concern among developing countries (Lora, 2007). The relative contributions of private and public investments to the growth process have been examined in the empirical literature, although most of the studies focus on developed countries. In general the evidence is mixed. Some studies find that public investment tends to crowd in (increase) private investment, while others find that it has a crowding-out effect. However, research on the effect of public and private investment on economic growth and external remains limited.

Public investment rates in Africa have declined relative to the 1980s and are currently below optimal levels. It is therefore crucial to focus on the distribution of private and public investment. The long-term trends of investment in Africa show a dramatic decline in public investment since the beginning of the 1980s. Following a steady rise from 1970 (5%) to a peak of 11.5% in 1982, public investment has since declined to about 5 per cent in 2012. Today, public investment is at about half its peak level in the early 1980s. In the second half of the 1970s, public investment rose as private investment declined, and this trend was reversed in the early 1980s with public investment declining and private investment rising. While there was a significant decline in public investment in the 1980s, in the 1990s and 2000s it was relatively more stable at the continental level (UNCTAD, 2014).

The average public investment rate in Africa in the period 1990–1999 was 7.6 % and over the period 2000–2012 it was 7.5%. But the stable investment rates at the aggregate level hide the fact that many African countries have experienced a significant decline in public investment rates over the past

two decades. The evidence shows that there has been a decline in public investment rates in at least 23 countries over the past two decades, with the most dramatic declines observed in the following countries: in Cape Verde it fell from 18.1% to 13%; in Egypt it fell from 14.5% to 8.2 %; in Eritrea the decline was from 17.6 per cent to 13.4 per cent; and in Lesotho the public investment rate fell from 18.2% to 9.1% (UNCTAD, 2014).

There are many reasons behind the decline in public investment in Africa. The decline began in the early 1980s and coincided with the time most African countries were hit by the external debt crisis. As countries ran out of finances due to high commitments in debt servicing, public investment declined as a result of budgetary cost cutting measures. The 1980s were followed by a period of structural adjustment reforms which advocated for a reduction in the role of the state in the economy and recommended austerity measures. This led to a reduction in the amount of public investment. However, the degree of dependence on public investment varies widely across African countries. The countries that have with the highest debt to GDP ratios in Africa over the 2000–2012 period include Eritrea, Angola, Ethiopia, Libya, Mozambique, Guinea-Bissau, and Rwanda. According to Fosu et al (2012) the decline in public investment in Africa should be an issue of concern. This is because growth in African countries has been hampered by public “underinvestment”, since the actual public investment continues to remain below the optimal level required to attain high growth. Fosu et al (2012) reported that public investment of 8.4% to 11% maximizes consumption. However, in Africa, the public investment has averaged 7.5% between 2000 and 2012.

African countries have historically used external finance such as FDI, debt, and official development assistance (ODA) to complement domestic resources for investment and this is evidenced by the fact that the continent has had a positive investment–savings gap over the past few decades. For example, in the period 1980–1989 the investment–savings gap of the continent as a percentage of GDP was 1.2%. More recently, there has been a significant decrease in the gap. In particular, for the period 2000–2011, the continent had a negative investment, a savings gap of about 2.8 %, reflecting the fact that more investment is financed through domestic sources. While there can be a correlation between the level of saving and other forms of financing on one hand and investment on the other, it is not possible to



infer causality. There are other factors that influence investment decision which may also influence the relationship between investment and these potential sources of financing for investment (UNCTAD, 2014).

In Kenya, external debt stocks have been increasing since 2000, rising from US\$ 6,189 million in 2000 to US\$ 8,801 million in 2010. There has been also a steady increase from 2011 (US\$ 10,287), 2012 (US\$ 11,569), and 2013 (US\$ 13,471). There is concern among policymakers that the rapid increase in external debt in developing countries such as Kenya has the potential of eroding the country's sovereign rating, particularly if it is not supported by proportionate growth in the size of the economy (Nord, Harris, & Giugale, 2013). Higher government debt ratios may depress growth through crowding-out effects on investments and inefficient resource utilization (Checherita & Rother, 2010), increase government interest payments forcing the government to default or impose inflation tax (Miller & Foster, 2012). Clements, Bhattacharya & Nguyen (2003) established that a substantial increase in the stock of external debt for highly indebted poor countries (HIPCs) directly reduces per capita income growth; reductions in external debt service could also provide an indirect boost to growth through their effects on GDP to total investment ratio.

Various empirical studies have been done in Kenya on the relationship between debt and macroeconomic indicators. However, different studies have used different empirical strategies and data sets covering different time periods. A majority of the studies reviewed are limited in scope, and there is a paucity of research on the relationship between public investment as a percentage of GDP and external debt. This study investigates the empirical relationship between public investment to GDP ratio and external debt in Kenya, over the 1972 to 2012 period.

2.0. LITERATURE REVIEW

2.1. THEORETICAL REVIEW

Keynesian economics originated with the publication of *The General Theory of Employment, Interest and Money* in 1936. The theory was developed as a response to the inability of the classical economics theory to explain the massive unemployment rates following the Great Depression of the 1930s. The central assumption of the

theory is that aggregate demand for production is the primary source of business-cycle instability. The main economic implication is that without government intervention, economic instability runs rampant (Hawke, 2008).

There are five major propositions of Keynes in *The General Theory of Employment, Interest and Money*: equilibrium, competition, money, expectation and liquidity. With regard to equilibrium, employment is in continuous equilibrium that corresponds to the point of effective demand. Equilibrium does not imply that available labour and capital goods are employed, factor markets clear, or that expectations have been fulfilled. Competition in demand and supply is the force that holds the equilibrium. Agents take the prices in the market to be independent of their actions, and the degree of competition is different from the degree of monopoly. On money, equilibrium is a reflection of the decisions to incur money expenses by employers, investors and consumers, as opposed to being an optimal allocation of factors if production. Money is an integral part of value and employment but the factor cost-unit is not an equilibrium value. Effective demand in the economy corresponds to the level of expectation. All production, consumption, and investment decisions are based on expectation. The long and short term is different from the long and short equilibrium periods, and long-term expectations are uncertain. Liquidity is not just a measure of convertibility, but also includes the invariance of value relative to changes in expectation (Hawke, 2008).

According to the Keynesian theory, public spending is the remedy against unemployment. In a situation where there is unemployment and idle resources, there is a definite employment-creating effect of public outlays even when they are not fully covered by taxes. The Keynesian theory justifies debt-finance expenditure, since productive government expenditure enhanced by borrowing have the potential of enlarging the national income roughly by the amount of government expenditure, even though subsequently financed through consumption taxes (Joshi, 1995).

This theory was heavily relied on during the 1930s and 40s following the great depression. The non-burden borrowing was used by Keynesians to support the position that through debt-financing, governments could tap into surplus savings and use them for productive expenditures and increase national income. Debt creation opens the door for the



utilization of utilized resources for productive utilization, enough to allow tax payments for serving debt to be met by the increased income. Further, since the government is using the debt for productive investments, there is redistribution of wealth across generations, as the taxes they'll pay are balanced by the assets left by the current generation. However, classical economist Buchanan (1958) disagreed with this position noting that taxpayers in the future always bear the burden of public debt. He maintains that generations living at the time of debt creation, on aggregate do not bear the burden and only give a part of their income. Debt financing postpones the levy of taxes hence shifting taxes to the future generation.

The Keynesian approach opposed this approach advocated for unbalanced budget only when dealing with the effects of depression. In fact, Keynes's 'General Theory of Employment, Interest and Money' of 1936 provided the foundation for the scientific understanding of the theory of public debt. According to Keynes, resorting to public debt is desirable when an economy is going through depression. This was informed by the fact that, during depression aggregate demand decreases, investment shrinks, and unemployment rate increases leading to low growth rate of output. To avert these fluctuations, deficit financing can be sought and public borrowing permitted over the short term. In such a situation, public debt acts as an anti-cyclical fiscal policy measure that provides a push forward to economic operations and saves the economy from the danger of recession (Keynes, 1936).

According to Keynes, there is a limit to the extent to which the government can resort to debt-financing. If the government borrows during full-employment equilibrium, it would result in displacement of resources from the private sector for use in the public sector. Given the resources/funds availability in the economy and the private sector demand for the same capital, an increase in government demand for these funds increases the interest rate, which in turn leads to the crowding-out of private investment and setting off recessionary trends (Mallick, 2002). However, the overall impact if interest rate on aggregate investment *ceteris paribus* (as investment depends on other factors as marginal efficiency of investment and cost of capital depends on the elasticity of investment demand with regard to interest rates. This requirement for an unbalanced budget has been extended by theories in public finance to provide a framework through which a country could borrow to finance

development programs in the public sector in order to revive economic prosperity. It should therefore be understood that flexible budgeting is just an extension of classical/orthodoxy theory and its created to accommodate government borrowing as an instrument of fiscal policy (Mallick, 2002).

Under Keynesian economics, if GDP fell, private sector investment would fall too. However, if the government expenditure increased, the growth rate will increase as well and encourage the private sector to invest in the economy. This is the accelerator effect, and government investment would complement and not crowd-out private investment. Another Keynesian theme is that the economy is unable to get out of a recessionary gap without government support.

There are methods of computing GDP: the expenditure approach and the income approach. Under the expenditure approach, GDP is computed as the sum of consumption, expenditure, investment, government expenditure on goods and services and net exports (Viet, 2012). This is presented as:

$$Y=C+I+G+(X-M)..... (1)$$

Where Y is GDP, C is the consumption expenditure, I is the investment, G is the expenditure on goods and services, and $X-M$ is the net exports of goods and services.

In the income approach, GDP is a total of the incomes paid by firms to households for the factors of production that they engage. The incomes include wages, salaries and other forms of labour income, as well as other factor incomes. The total of all incomes is the *net domestic income at factor cost*. However, there are adjustments that must be made on this summation to get the GDP. The two adjustments are: indirect taxes less subsidies are added so as to move from *factor cost* to *market prices*; and second, depreciation is added so that the total moves from being *net domestic income* to *gross domestic income* (Viet, 2012). Therefore, compute GDP using the income approach, the following equation applies:

$$NIMP=NIFC-(IT-S).....(2)$$

Where *net domestic income at market prices* is the summation of *NIFC (net domestic income at factor cost)*, IT is Indirect taxes, and S is Subsidies.

$$GDP=NIMP+D.....(3)$$



Where, *NIMP* is the *net domestic income at market prices* and *D* is the Depreciation.

The real GDP is calculated using the expenditure approach since the components required to compute GDP using the income approach cannot be split between a quantity value and a price value, meaning that there is no indicator that can be used to eliminate the effect of inflation. Real GDP is used by government, policymakers, domestic and international financial institutions, and business to determine a country's health. An increase in real GDP means a positive development in the economy. Real GDP has a direct relationship with other key macroeconomic variables in the economy such as business cycles, productivity, employment and long-term economic growth. On the other hand, Nominal GDP is computed using current dollars and takes into account both income and expenditure approaches. Therefore, Nominal GDP is used to reconcile the income and expenditure-based GDP. However, these approaches may not always give equal results creating a statistical discrepancy. Ideally, the discrepancy is the difference between income-based GDP and expenditure-based GDP divided by 2, the result of which is added to the smaller GDP to reconcile the two figures (Statistics Canada, 2016).

At the end of every reporting period (government financial year), the real GDP at a time, *t*, is calculated as:

$$GDP_t = C_t + I_t + G_t + (X_t - M_t) \dots \dots \dots (2)$$

From equation 2, public investment is a component in the calculating of GDP, thus a change in public investment results in a change in GDP. Delong and Summers (2012) identified two scenarios under which public investment may affect the GDP output and debt-to-GDP ratio. First, an increase in public investment or any increase in government spending increases demand in the short term, though this effect varies from one economy to the other. The increase in government spending may also affect debt-to-GDP ratio depending on the fiscal multiplier and the elasticity of revenues to output. Delong and Summers (2012) note that in the short term, typically one year, an increase in public investment as a share of potential change in GDP changes the debt-to-GDP ratio.

Public investment incorporates business investment in equipment, but it does not include exchange of existing assets. Also called economic investment, it is capital investment and should not be confused with financial

investment, since capital is deployed in expectation of deriving income or profit from its use. Gross domestic private investment (*I_G*) includes all final purchases of machinery, all construction including residential, and changes in business inventory. To compute net private domestic investment (*I_N*), consideration is made for the production of current output wears out existing capital equipment and buildings deteriorate. This is what is called depreciation or consumption of fixed capital. Therefore, net private domestic investment is gross private domestic investment minus depreciation (consumption at fixed capital). From equation 2.3, public investment is presented as:

$$I = GDP - (C + G + (X-M)) \dots \dots \dots (3)$$

Where *GDP* is the Gross Domestic Product, *C* is the consumption expenditure, *I* is the investment, *G* is the expenditure on goods and services, and *X-M* is the net exports of goods and services.

2.2. EMPIRICAL REVIEW

Early researchers such as Servén & Solimano (1990) reported a positive effect of investment on growth, these studies had smaller samples and covered shorter periods and therefore do not provide a robust solution. Studies such as Khan & Kumar (1997) sought to increase the sample size and the duration when examining the effect of public and private investment on growth in developing countries. The sample used was 95 developing countries and the period covered was 1970 to 1990. The findings showed that there were significant differences in the effect of public and private investment in different regions (Africa, Asia, Europe, Middle East, and Latin America). Generally, public infrastructure projects are large and are implemented over a long duration of time. As such, they are mostly financed through public debt. However, over indebtedness may increase the costs of public investment projects and create a vicious cycle that increases the inability to source funds for new investment projects and negatively affect economic growth due to high levels of debt serving (Lora, 2007).

According to Easterly and Servén (2003), debt crisis in the 1980s was responsible for the collapse in public investment in infrastructure in Latin America and the Caribbean. In a study by Patillo *et al.* (2004), a growth-accounting framework was applied to 61 developing countries and the results showed that doubling the external debt leads to a



reduction in the per capita GDP growth and total factor productivity growth by one percentage point. Mahdavi (2004), studying 47 countries over the period spanning from 1972 to 2001, found that debt burden has an adverse effect on capital expenditure.

Clements *et al* (2003) investigated the determinants of public investment using a data set of 55 low income countries from 1970 to 1999. One of the determinants of public investment was external debt stocks and debt service. The results indicate that there was no significant effect of external debt stocks on public investment. This was because public investment was being driven by the current fiscal position and resource availability as opposed to factors affecting long term fiscal sustainability. On the contrary, the findings showed that high levels of debt service has a significant effect on public investment, noting that every percentage increase in debt-GDP ratio leads to a 0.2 percent decrease in public investment to GDP ratio.

Audu (2004) investigated the relationship between external debt on economic growth and public investment in Nigeria from 1970-2002. The empirical investigation was done using the Co-integration test and Error Correction Method. The findings reported demonstrate that there was a significant and adverse effect of high debt servicing pressures and growth. Further, past debt accumulation negatively affected public investment. In another study, Lora (2007) investigated public investment in Latin America, with the intention of examining the effect of increases in debt. The sample included 7 countries and the data covered the period, 1987 to 2001. The study reported that an increase in debt is associated with increase in public investment in infrastructure. The study also showed that there was a complementarity between total investment and the negative effect of IMF adjustment loans on public infrastructure expenditures. However, the study did not find any evidence supporting the position that debt defaults affect investment in public infrastructure (Lora, 2007).

Other studies in African data do show that public investment has a positive effect on growth through raising the effectiveness of private investment. In other words, public and private investments are complementary. Samake (2008) found that public investment crowds in private investment,

and that both types of investment have a significant impact on growth in Benin. Similar evidence has also been provided for Cameroon (Ghura, 1997). Other studies have found that public capital is generally productive and boosts output at the sectoral or national level. An example is the study on South Africa by Fedderke *et al.* (2006). Additional supportive empirical evidence on the role of public investments in the growth process in Africa can be found in Fosu *et al.* (2012). These findings confirm the strategic role of public investment in the growth process. It is practically difficult to imagine strong economic performance in Africa in the absence of the supply of adequate quantity and quality of infrastructure, and this is one area where public investment plays an important role.

Debt to GDP ratio is an indicator of economic stability and is often used to determine a country's ability to absorb more debt. Higher debt to GDP ratios leads to difficulties in debt refinancing its debt. At the same time, higher debt levels also increases the risk of default in repaying external debts. According to Clements, Bhattacharya & Nguyen (2002), a substantial reduction in the stock of external debt for highly indebted poor countries (HIPC)s directly increases per capita income growth by about 1 percentage point per annum. Reductions in external debt service could also provide an indirect boost to growth through their effects on public investment. If half of all debt-service relief were channelled for such purposes without increasing the budget deficit, then growth could accelerate in some HIPC)s by an additional 0.5 percentage point per annum. The study focuses on the nature of the relationship between external debt and total investment in the country.

3.0. METHODOLOGY

The study used time-series data for public investment, GDP, and external debt from IMF International Financial Statistics database. All data was evaluated, cross-checked, compared and critically analyzed. The gauge the relationship between the external debt and growth in Kenya, a simple open macroeconomic debt growth model will be applied. Regression analysis of Ordinary Least Squares (OLS) will be used to determine the relationship between public investment to GDP ratio and external debt over the 1972 and 2012 period in Kenya.



The model took the form of:

ED = f(PIGDP)..... (4)

Where ED = External debt and PIGDP = Public Debt to GDP ratio

In stochastic form, the question becomes:

ED=β0+β1PIGDP+ε..... (5)

Where:

ε = Error term

β1 = slope of the regression equation

To ensure that the data does not violate the assumptions of classical linear regression model (CLRM) and test for stationarity, the study tested for unit tests using Augmented Dickey-Fuller (ADF). To test for the verifiability of the estimated long run model, additional diagnostic tests, notably: heteroskedasticity, autoregressive conditional heteroskedasticity (ARCH), autocorrelation and normality, were carried out before regression was used to determine the relationship between external debt and inflation.

4.0. RESULTS

4.1. DESCRIPTIVE STATISTICS

Total investment to GDP ratio for Kenya has been experiencing fluctuations for the period between 1972 and 2012. The spike in public investment in 1978 was due to the coffer boom. The financial liberalization and structural adjustment programs in 1980s led to a decline in public investment, with significant decline going up to the early 1990s as a result of the oil crisis. For instance, after oil crisis of the early 1970s total investment as a percentage of GDP rose sharply until 1978 where it started to fall though with some mild fluctuations. After the Kibaki took over power in 2002, total investment as a percentage of GDP has been steadily rising.

From 2002, Kenya put into place a new development blueprint, Vision 2030, which has been responsible for the increase in public investment. Under Vision 2030, Kenya aims to raise the level of investments from the current estimate of 20% of GDP to above 30% of GDP consistent with the levels of double-digit growth the country aspires to. Further, increases in investment are expected to be achieved through maintaining a strong revenue position, restructuring outlays toward development expenditures, increased project financing from development partners, judicious recourse to domestic and foreign borrowing to build infrastructure, and increasing private sector investment (Government of Kenya, 2007).

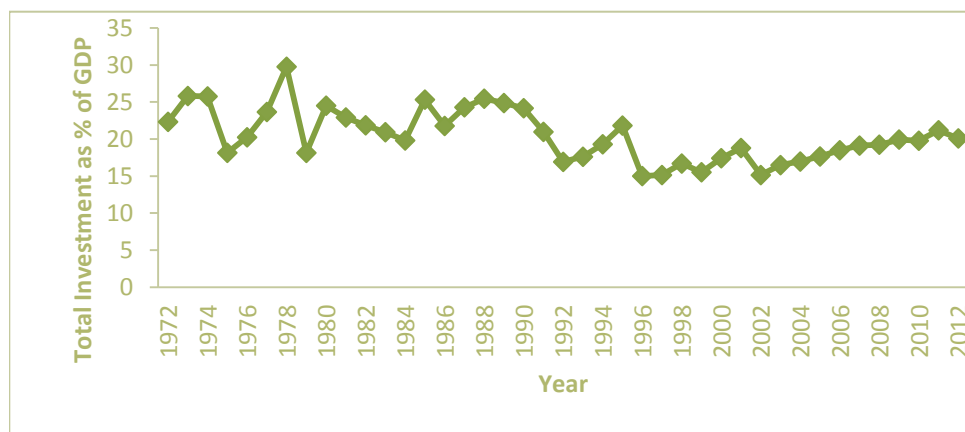


Figure 1: Total Investment as Percentage of GDP

4.2. INFERENCE STATISTICS



The correlation analysis for external debt and total investment indicate a Spearman's correlation coefficient of -0.5618 with a P value of 0.0001. The negative value of Spearman's correlation coefficient indicates that external debt and total investments are negatively related and the relationship is statistically significant since the P value is smaller than 0.05.

The regression results for total investment as a percentage of GDP on external debt indicate an F statistic of 0.26 with a p value of 0.6156 implying that the F statistic is insignificant. The R square is 0.0067 indicating that 0.7 percent of variations in external debt are explained by variations in total investment/GDP ratio. This value of R square is way below that of 50 percent implying that total investment/GDP ratio poorly fits the regression model. The coefficient for total investment is 0.0724 and has p value of 0.3618 implying that individually total investment as a percentage of GDP does not significantly influence external debt.

Table 2: Total Investment/GDP Ratio on External Debt

Source	SS	df	MS	Number of obs = 40
				F (1,38) = 0.26
Model	0.0053	1	0.0053	Prob> F = 0.6156
Residual	0.7868	38	0.0207	R-squared = 0.0067
				Adj R-squared = -0.0194
Total	0.7921	39	0.0203	Root MSE = 0.1439

	Coefficient	Standard Error	T	P>t	[95% Confidence Interval]	
					Lower	Upper
Total Investment	0.0724	0.1430	0.51	0.616	-0.2170	0.3618
Constant	0.1367	0.0228	6.01	0.000	0.0907	0.1828

4.3. DISCUSSION OF THE RESULTS

The study sought to establish the relationship of total investment/GDP ratio and external debt. Correlation analysis indicated a negative and significant relationship between external debt and total investment/GDP ratio. The results show as external debt increases, total investment as a

percentage of GDP decreases. Increase in total investments implies less and less dependency. Therefore, in the long run, an increase in total investment leads to a decrease in external debt thus the negative relationship demonstrated by correlation analysis. The regression findings did not report a statistically significant relationship between total investment as a percentage of GDP and external debt.



According to UNCTAD (2014), public investment rates in Africa have declined relative to the 1980s and are currently below optimal levels. While there was a significant decline in public investment in the 1980s, in the 1990s and 2000s it was relatively more stable at the continental level (UNCTAD, 2014). The average public investment rate in Africa in the period 1990–1999 was 7.6 % and over the period 2000–2012 it was 7.5%. But the stable investment rates at the aggregate level hide the fact that many African countries have experienced a significant decline in public investment rates over the past two decades. The evidence shows that there has been a decline in public investment rates in at least 23 countries over the past two decades. In Kenya, while the public investment as a percentage of GDP has been increasing since 2002, the levels are still below public investment 1970s. The UNCTAD report confirms the negative correlation reported in this study, which shows that an increase in external debt has been accompanied by a decrease in public investment/GDP ratio.

Easterly and Servén (2003) noted that the debt crisis in the 1980s was responsible for the collapse in public investment in infrastructure in Latin America and the Caribbean. Lora (2007) investigated public investment in Latin America, with the intention of examining the effect of increases in external debt. The sample included 7 countries and the data covered the period, 1987 to 2001. The study demonstrated that public infrastructure projects are large and are implemented over a long duration of time. As such, they are mostly financed through external debt. However, over indebtedness may increase the costs of public investment projects and create a vicious cycle that increases the inability to source funds for new investment projects and negatively affect economic growth due to high levels of debt servicing (Lora, 2007).

Another study by Clements *et al* (2003) which focused on the determinants of public investment using a data set of 55 low income countries from 1970 to 1999, also found out that there was no significant effect of external debt stocks on public investment. This was because public investment was being driven by the current fiscal position and resource availability as opposed to factors affecting long term fiscal sustainability. On the contrary, the findings showed that high levels of debt service has a significant effect on public investment, noting that every percentage increase in debt-GDP ratio leads to a 0.2 percent decrease in public investment to GDP ratio.

A study by Audu (2004) focused on the relationship between external debt on economic growth and public investment in Nigeria from 1970-2002. The empirical investigation was done using the Co-integration test and Error Correction Method. The findings reported demonstrate that there was a significant and adverse effect of high debt servicing pressures. Debt accumulation negatively affected public investment.

According to Clements, Bhattacharya and Nguyen (2002), a substantial reduction in the stock of external debt for highly indebted poor countries (HIPCs) directly increases per capita income growth by about 1 percentage point per annum. This reduction in external debt service provides an indirect boost to growth through its effect on public investment. If half of all debt-service relief were channelled for such purposes without increasing the budget deficit, then growth could accelerate in some HIPCs by an additional 0.5 percentage point per annum.

5.0. CONCLUSIONS

The study concludes that over the 1972-2012 study period in Kenya, an increase in the level of public investment to GDP ratio was associated with a decrease in the level of external debt; however, only a mere 0.7 percent of variations in external debt are explained by variations in total investment/GDP ratio. The relationship between total/investment to GDP ratio and external debt was not significant. Since increase in total investments implies less and less dependency in debt, the historical decrease in the level of public investment as a percentage of GDP means that the country continues to rely on external debt to fund the country's investment needs. The study recommends a reduction of this dependency through public-private partnerships for mega-infrastructure developments since this will not increase budget deficit and necessitate external borrowing.

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