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Effects of Fiscal Policy on Private Investment and Economic Growth in Kenya

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Abstract
The purpose of this study was to investigate the effects of fiscal policy on private investment and economic growth in Kenya, the study uses a time series data from 1973 to 2009, the choice of the study period was informed by availability of data and the magnitude of the problem on the study period. We adopted Two stage instrumental variable estimation method to perform our regression analysis because of its adaptability. The results indicate that fiscal policy impacts on investment and investment plays a major role in the determination of the economic growth in Kenya. It is from this findings that we recommend that the following three measure a can be adopted accordingly;- reexamination of government spending to eventually make it complementary to investment, channeling more credit to the private sector, and finally designing appropriate policies that deal with the current high domestic public debt and budget deficit.
Keywords: - Fiscal policy, Private investment, Economic growth, Instrumental Variable Method

1.1 Introduction.

To understand the relationship between the fiscal instruments and the target variables, let recalls that the target variables are interrelated with independent variables. Therefore, a change in one policy variable intended to affect one target variable affects all other macro variables. The extent of effect depends on the extent of their relationships. For example, change in taxation, changes disposable income which in turn changes the consumption expenditure, savings and investment. This affects the external balance by changing imports. Also, an autonomous change in one of the macro variables can cause a change in other macro variables and policy variables.

Fiscal policy affects aggregate demand, the distribution of wealth, and the economy's capacity to produce goods and services. In the short run, changes in spending or taxing can alter both the magnitude and the pattern of demand for goods and services. With time, this aggregate demand affects the allocation of resources and the productive capacity of an economy through its influence on the returns to factors of production, the development of human capital, the allocation of capital spending, and investment in technological innovations. Tax rates, through their effects on the net returns to labor, saving, and investment, also influences both the magnitude and the allocation of productive capacity.

To illustrate the importance of the difference in these two views for fiscal policy stabilization, consider the effects of a cut in personal taxes is a classic countercyclical fiscal policy action. Lower taxes, everything else being constant, increase households 'disposable income, allowing consumers to increase their spending. The consequences of the cut are how much is spent or saved, and the responses of economic activity depend on the way households make their decisions and on prevailing macroeconomic conditions.

However, consumption can increase more significantly when the economy is not at full employment and if the tax cut is seen as an instance of a continuing fiscal policy that stabilizes economic activity, or if the tax cut otherwise raises households 'expected income by increasing the economy's future productive capacity. Although the tax cut entails an increase in public debt, higher current and future income diminishes the burden of servicing or repaying this debt. In this case, the tax cut is essentially an investment in a public good that redounds to the benefit of households.

Over time, an increase in the budget deficit resulting from a tax cut will increase the public debt. That increase raises important issues concerning the long-run effects of the tax cut on interest rates, capital investment, and future economic welfare. The rich range of possible consequences makes this a very controversial and interesting topic. Fiscal policies that increase the deficit will result in future taxes being higher than they otherwise would have been, but, depending on the policies 'effects on incentives for investing in human or physical capital, they might also raise future living standards. Policies that absorb slack resources or foster investment might reduce government saving, as reflected in the greater budget deficit, while they increase total saving, as reflected in the greater rate of capital formation. This additional saving might be supplied by the increase in national income, or

it might come from foreign sources. Policies that fail to raise income and investment not only reduce government saving, but also reduce total saving.

Closely related to investment is foreign aid. In theory, foreign aid could relax any or all of the constraints on investment (Bacha, 1990). The savings constraint arises if, as is likely in low-income countries, domestic savings are insufficient to meet (public) investment requirements; aid (foreign savings) relaxes the constraint. The foreign exchange constraint arises because investment requires imported capital goods and the 'free' foreign exchange available from export earnings may be insufficient; as aid is in the form of foreign exchange, it permits a higher level of (capital) imports. The fiscal constraint captures the possibility that government behavior affects private savings and public investment can affect private investment; aid, by financing public investment and reducing the need to raise revenue to finance a deficit, can relax this constraint. This study therefore investigates the effects of fiscal policy on private investment and economic growth in Kenya

2.0 Methodology.

The studies reviewed have been very informative about the analytical techniques that were suitable to investigate the interrelationship between fiscal policy, investment and growth. Many of the studies have used regression analysis which produced convincing and reliable results suitable for generating useful policy recommendations. This study also follows the same line of analysis. Regression analysis was used and one of the hypotheses to be tested postulate that the use of fiscal policy in Kenya since 1971 has given rise to an increase in investment and growth rate in the Kenyan economy.

2.1 The Econometric Models

The estimated equations in this study were specified in linear form. The choice of linear relationship has been based on its performance in many situations reviewed in the literature.

Two sets of equations were estimated: one set corresponding to investment and the second set corresponding to growth. In each case the first model represents the investment equation and the second representing growth equation.

2.1.1 MODEL 1- The Investment Equation

By following Helms (1983), Bleaney (1993), Fielding (1997); Adam and Kupukile(1996); Hilt and Pastor (1993), Mensa 2005, Kiptui (2005) and others with little modification in terms of the variable that they included in their analysis and the functional forms adopted, and also taking into consideration the fiscal characteristics of Kenya, the study postulate that investment in Kenya is determined by past investment, foreign capital inflow, budget deficits, real interest rate, government consumption expenditure, tax burden and public debt burden among other factures. The investment equation was expressed as:

$$INV = \alpha_0 + \alpha_1 INV(-1) + \alpha_2 GCX + \alpha_3 FCI + \alpha_4 RINT + \alpha_5 TB + \alpha_6 BD + \alpha_7 EXDS + D + \mu \quad \ldots\ldots (1)$$

Where INV is Investment level, INV(-1) is the past investment level, FCI represent foreign capital inflow, BD is the size of budget deficit, RINT is the real interest rate, GCX is the government consumption expenditure, TB is tax burden, EXDS is the debt service, D is the dummy variable and μ is the stochastic error term. The sign of the coefficients that estimated in the study was determined in accordance with theoretical expectation.

2.1.2 MODEL 2- The Growth Equation

From the literature reviews, the growth equation was also specified in linear form. The growth equation to be estimated would be dependent on growth rate of exports, Investment/GDP ratio, exchange rate, debt service and growth in terms of trade. Thus the equation was written as:

$$GGDP = \beta_0 + \beta_1 GNEX + \beta_2 INV + \beta_3 EXR + \beta_4 EXDS + \beta_5 GTT + D + \varepsilon \quad \ldots\ldots\ldots\ldots (2)$$

Where, GGDP *is* the Growth rate of Gross domestic product; GNEX is the growth of exports. EXR is exchange rate; GTT is a measure of Growth in terms of trade. EXDS is the debt service. INV represents investment/GDP ratio and ε is the stochastic error term.

2.3 Data Analysis and Estimation Procedure

Annual data from 1973-2009 for the domestic economy was used for estimations. Since the two equations form a system of simultaneous equations and all the equations in the system are over identified by both the rank and order conditions, the system was estimated using Two Stage Instrumental Variable technique. Standard statistics was used to analyze the results from our regression techniques. Especially, the popular t-statistics would be used to verify for the significance of individuals parameters estimated. The F -test and adjusted R^2 was used to

determine the overall significance of the models. The Durbin Watson statistic (DW) was used to test for autocorrelation. The econometrics package used in running the regressions was Microfit.

3.0 Discussion of Findings

3.1 Investment and Growth Equation Analysis.

The Investment-Growth equation simultaneous equation was estimated. The endogenous variables were investment/GDP ratio (INV) and growth rate of gross domestic product(GGDP) while the exogenous variables were lagged investment (INV(-1)); government consumption expenditure (GCE) real interest rate (RINT), tax burden (TB); budget deficit (BD); foreign capital inflow (FCI); external debt services (EXDS); for the investment equation and investment (INV); growth of export (GNEX); exchange rate (EXR); and growth of terms of trade (GTT) for the growth equation. The results and their analysis are presented in the section that follows.

3.2 Regression Analysis.

3.2.1MODEL 1: The Investment Equation.

In model 1.0, representing the period 1973-2009 respectively, we used the adjusted coefficient of determination R^2 to measure the fraction of the variation in investment that is explained by the regression equation. According to Mukras (1993), the main weakness of the unadjusted R^2 is that it does not take the degrees of freedom into account, a weakness that is corrected by using the adjusted R^2.

Thus, in the model 1.0, the adjusted R^2 shows that about 95 percent of the variations in the INV are explained by the explanatory variables. Only 5 percent of the variations remains unexplained and are taken care of by the error term. We therefore concluded that the investment model has a good fit. It was expected that the sign of the coefficient of INV (-1), FCI and GCX would be positive while the sign of the coefficients of RINT, EXDS TB and BD would negative.

The sign of the coefficient of INV (-1) was positive as expected. There is a lag effect in investment meaning that during the adjustment period, the level of investment in a previous period did affect the level of investment in the following period. The t-statistics of 26.1785 indicates that the variable is significant at the 5% level.

The sing of the coefficient of GCX variable was positive as expected. The t-statistics of 1.8874 indicates that, the variable did assume it's a-priori sign; it is significant at 5% level. The reason for this may be attributed to the fact that during the adjustment period, GCX was so large that it constituted a significant portion of public investment in Kenya.

The sign of coefficient of the FCI variable was positive as expected. This conforms to our theoretical expectations. The t statistic of -0.41906, indicates that the variable is insignificant at 5% level. This can be explained by the fact that during the adjustment period, foreign capital inflows mainly made up of grants really had a positive but insignificant effect on investment in the country. Thirwall (1989) noted that the role of foreign capital needed to finance the difference between domestic investment requirements. Hence, the positive relationship between foreign capital inflow and investment.

The sign of coefficient of the RINT variable conforms to theoretical expectations. The implication is that during the adjustment period, INV and RINT were negatively related. The t statistics of -1.8832 indicates that the variable is significant. This result is therefore in accordance with the empirical studies that found a negative relationship between RINT and investment. Our finding also conforms to Keynes traditional theory of investment which postulates a negative relationship between investment and interest rate. This is because of the prevailing high inflation rate in the country even up to now. Mckinnon and Shaw (1973) argued that liberalization of financial sector and high real interest rate resulting from fiscal policy adjustment has a tendency of increasing rather than reducing investment in the aggregate.

The sign of the coefficients of TB and BD were negative as expected. The t ratios of TB and BD which are -2.5638 and -0.30842 respectively indicate that TB is significant at 5% level in determining the rate of investment while BD is insignificant at 5% level.

The sign of the coefficient of EXDS was negative and does conform to our theoretical expectations. The t ratio of -0.50527 implies that EXDS is insignificant at 5% level. The implication is that an increase in debt service can only be met by reducing domestic absorption. Brempong (1996) and Darko (1998) found similar negative relationship between INV and EXDS. The reason for the increase in debt service follows the fiscal policy adjustment on debts which was aimed at gradually honoring the payment of all outstanding debt with the idea of uplifting Kenya's image and improve the confidence of international trading and finance community in Kenya's economy.

A critical analysis shows that a negative causal relation from liberalization to investment is observed implying

that liberalization linkage is not automatic to the growth of the investment in Kenya as observed from the dummy variable coefficient. It has further been showed that countries ability to take advantage of the positive effects of liberalization depends on absorptive capacity and the local conditions favoring the growth of development local investors. This finding is in line with the findings of Kiptui (2005) who analyzed the effects of fiscal policy on the private investment in Kenya.

As already stated, the econometric problem of serial correlation was tested in investment model. Thus Durbin's w is normally distributed. So a 95 percent two-tailed test implies a critical z-value of 1.96. Therefore the decision rule is that if the absolute value of w is greater than 1.96 we reject the null hypothesis of no first order serial correlation. If the absolute value of w is less than 1.96, we accept the null hypothesis of no first-order serial correlation.

Since w=n<1.96 we accept the null hypothesis of no first-order serial correlation and concluded that there is indeed no significant correlation in investment model.

Finally, the statistical significance of F-statistics for the joint significance of explanatory variables implies a strong causality between fiscal policy variables and investment. The observed results are consistent with previous evidence of existence of causality relationship between fiscal policy variables and investment in a two variable framework.

3.2.2 MODEL 2: The Growth Equation

In model 2, covering the period 1973-2009, the equation has high explanatory power as indicated by the adjusted R^2 of 0.58580 implying that 59 percent of the variations in GGDP are explained by the explanatory variables and only about 41 percent of the variations remained unexplained. GGDP model 2.0 is therefore a good fit. It was expected that the sign of coefficients of INV, EXR, and GNEX, wound be positive while the signs of the coefficients of EXDS and GTT would be negative.

The sign of coefficient of INV was positive as expected. The t statistic of 3.3150 indicates that INV is significant at 5% level. The implication is that INV is important in determining GGDP in Kenya. This shows that during the adjustment period, investment was really seen as an engine of economic growth in Kenya

The EXR coefficient sign was positive and does conform to the expected theoretical a-priori. However the variable is also insignificant as indicated by the ratio of - 0.44947. The positive sign implies that fiscal policy adjustment of exchange rate policy characterized by devaluation of the currency did really lead to output growth in Kenya. Devaluation was considered the centerpiece of any fiscal policy reforms. As Dornbush et al. (1994) put it, devaluation increases the level of foreign prices measured in domestic currency terms. This therefore tends to increase competitiveness by inducing foreigners to buy more Kenya's exports, an outcome which is in conformity with the implementation of the fiscal policy reforms in Kenya.

The sign of the coefficient of GNEX was positive as expected. The t statistics of 0.84996 indicates that GNEX is insignificant in determining GGDP in Kenya in the period 1991-2008. The positive and significant relationship between the growth of export variable and economic growth shows of trade under the fiscal policy reforms conditions. The policies of trade and export promotions are deemed to be beneficial to Kenya in determination of growth of GDP. During this period, Kenya adhered to the World Bank and IMF conditionalities by embarking on diversification from traditional to non-traditional exports.

The coefficient of EXDS did assume its expected sign. However, the t-statistics of -0.39186 indicates that EXDS is insignificant at 5% level. The negative sign of the debt service variable explains Kenya situation of outstanding debt during the period. The implication is that an increase in debt service can only be met by reducing domestic absorption.

The sign of the coefficient of the GTT was positive as expected. The t ratio of 4.1925 indicates that GTT is significant at 5% level. The positive sign can be explained by the fact that during the adjustment period, collapsing commodity prices did help improve Kenya's terms of trade and hence an improvement in the economic growth.

A critical analysis shows that a negative causal relation from liberalization to investment is observed implying that liberalization linkage is not automatic to the growth of the investment in Kenya as observed from the dummy variable coefficient. It has further been showed that countries ability to take advantage of the positive effects of liberalization depends on absorptive capacity and the local conditions favoring the growth of development local investors. This finding is in line with the findings of Kiptui (2005) who analyzed the effects of fiscal policy on the private investment in Kenya.

Therefore based on the model 2.0, the study also finds that the variables that are significant in determining growth in Kenya are investment, growth in terms of trade and the openness of the economy, while external debt service was insignificant in influencing economic growth in Kenya.

As already stated at the beginning of this chapter, the econometric problem of serial correlation was tested in

investment model. Thus Durbin's w is normally distributed. So a 95 percent two-tailed test implies a critical z-value of 1.96. Therefore the decision rule is that if the absolute value of w is greater than 1.96 we reject the null hypothesis of no first order serial correlation. If the absolute value of w is less than 1.96, we accept the null hypothesis of no first-order serial correlation.
Since w=n<1.96 we accept the null hypothesis of no first-order serial correlation and concluded that there is indeed no significant correlation in investment model.
Finally, the statistical significance of F-statistics for the joint significance of explanatory variables implies a strong causality between explanatory variables and growth. The observed results are consistent with previous evidence of existence of causality relationship between those variables and growth in a theoretical analysis.

3.3Conclusions

The central hypotheses of the study have been to test how fiscal policy affected investment and economic growth. There is a significant change in investment and growth in Kenya within the study period. The econometric analysis shows that the benefits of fiscal restraint are even larger considering that domestic and foreign debt service; real interest rate, budget deficit and the tax burden all have negative effects on investment. The results also show that lag investment has positive effects on investment suggesting that the former has been complementary to the latter. These suggest that the benefits of fiscal restraints are not immediately realized. The implication was that previous year investment has had a significant effect on current investment. Surprisingly, government consumption expenditure has positive effects on investment.
The study confirms the importance of investment as the most important determinant of economic growth. The openness of the Kenyan economy also promoted investment as firms configured themselves in the face of increased competition for markets following liberalization. However, a dummy variable representing liberalization of the 1990s suggests that its effects were generally negative over this period. The study findings further indicate that increase in imports has a positive effect on investment (imports are investment related). The appreciation of the exchange rate promotes investment and a negative relationship exists between investment and real interest rate and hence a negative relationship between exchange rate and economic growth. Intuitively, lack of financial sector reforms and macroeconomic instability are the key factors that hindered investment over the study period.
The results have shown that the variables that are significant in determining investment and economic growth in Kenya are lagged investment, government consumption expenditure, foreign capital inflow, and terms of trade, real interest rate, debt service, budget deficit, tax burden and investment, growth of exports, debt service respectively.
These conclusion therefore show even though we obtained interesting results for first half and second half of the study periods, these cannot be relied upon for policy purposes. The result that are more important for this study are those obtained by data for the period 1971-2007 which covers the whole study period. This provides broader information on the determinants of investment and economic growth in Kenya and can be relied upon for the policy purposes.

3.4Policy Recommendations

The findings of this study call for government intervention in three areas: reexamination of government spending to eventually make it complementary to investment; channeling more credit to the private sector; and designing appropriate policies that deal with the current high domestic public debt and budget deficit.

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APPENDIX: REGRESSION RESULTS

Table 1.1: Regression results for the Investment Equation.

Instrumental Variable Estimation

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Dependent variable is INV
List of instruments:
C INV (-1) GCX FCI RINT
TB BD EXDS D
36 observations used for estimation from 1973 to 2009

****

Regressor	Coefficient	Standard Error	T-Ratio[Prob]
C	.71766	.020280	35.3883[.000]
INV (-1)	.19494	.0074464	26.1785[.000]
GCX	.7567E-3	.4009E-3	1.8874[.070]
FCI	.1686E-5	.2261E-4	.074542[.941]
RINT	-.7640E-3	.4057E-3	-1.8832[.070]
TB	-.3591E-5	.1401E-5	-2.5638[.016]
BD	-.1794E-4	.5816E-4	-.30842[.760]
EXDS	- .9725E-5	.1925E-4	-.50527[.617]
D	-.7632E-3	.0074434	-.10254[.919]

****

R-Squared	.96824	R-Bar-Squared	.95916
GR-Squared	.96824	GR-Bar-Squared	.95916
S.E. of Regression	.014808	F-stat. F(8, 28)	106.6849[.000]
Mean of Dependent Variable	.20490	S.D. of Dependent Variable	.073272
Residual Sum of Squares	.0061394	Value of IV Minimand	.0000
DW-statistic	1.6413		

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Diagnostic Tests

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* Test Statistics	* LM Version	* F Version	*
* A: Serial Correlation	*CHSQ(1)= .91277[.339]*	Not applicable	*
* B: Functional Form	*CHSQ(1)= 35.9174[.000]*	Not applicable	*
* C: Normality	*CHSQ(2)= 5.8460[.054]*	Not applicable	*
* D: Heteroscedasticity	*CHSQ(1)= .37284[.541]*	Not applicable	*

****

A: Lagrange multiplier test of residual serial correlation
B: Ramsey's RESET test using the square of the fitted values
C: Based on a test of skewness and kurtosis of residuals
D: Based on the regression of squared residuals on squared fitted values

Test of Serial Correlation of Residuals (IV case)

****

Dependent variable is INV
List of the variables in the regression:
C INV (-1) GCX FCI RINT
TB BD EXDS D

List of instruments:
C INV (-1) GCX FCI RINT
TB BD EXDS D
36 observations used for estimation from 1971 to 2007
****
Sargan's test statistic for serial correlation CHSQ(2)= 1.8168[.403]

Table1.2: Regression Results for the Growth Equation

Instrumental Variable Estimation
****
Dependent variable is GGDP
List of instruments:
C INV GNEX EXR GTT
EXDS D
36 observations used for estimation from 1973 to 2009
****

Regressor	Coefficient	Standard Error	T-Ratio[Prob]
C	.80020	.94856	.84359[.406]
INV	13.7126	4.1365	3.3150[.002]
GNEX	.026751	.031473	.84996[.402]
EXR	.0087751	.019523	.44947[.656]
GTT	.26013	.064102	4.0580[.000]
EXDS	-.8233E-3	.0020963	-.39272[.697]
D	-1.7245	.90850	-1.8982[.067]

****
R-Squared .65290 R-Bar-Squared .58348
GR-Squared .65290 GR-Bar-Squared .58348
S.E. of Regression 1.5927 F-stat. F(6, 30) 9.4051[.000]
Mean of Dependent Variable 3.9486 S.D. of Dependent Variable 2.4679
Residual Sum of Squares 76.1023 Value of IV Minimand .0000
DW-statistic 1.4313
****

Diagnostic Tests
****
* Test Statistics * LM Version * F Version *
****
* * * *
* A: Serial Correlation*CHSQ(1)= 2.9665[.085]* Not applicable *
* * * *
* B: Functional Form *CHSQ(1)= 2.2535[.133]* Not applicable *
* * * *
* C: Normality *CHSQ(2)= 1.5281[.466]* Not applicable *
* * * *
* D: Heteroscedasticity*CHSQ(1)= 3.2978[.069]* Not applicable *
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A: Lagrange multiplier test of residual serial correlation
B: Ramsey's RESET test using the square of the fitted values
C: Based on a test of skewness and kurtosis of residuals
D: Based on the regression of squared residuals on squared fitted values

Test of Serial Correlation of Residuals (IV case)
****
Dependent variable is GGDP
List of the variables in the regression:
C INV GNEX EXR GTT
EXDS D
List of instruments:
C INV GNEX EXR GTT
EXDS D
36 observations used for estimation from 1971 to 2007
****
Sargan's test statistic for serial correlation CHSQ(1)= 2.9665[.085]
****