Effect of External Budget Deficit Financing On Economic Growth in Kenya

Odongo George Otieno[1], Dr. Scholastica Odhiambo[2], Dr. Benjamin Ombok[3]

[1] Department of Economics,Maseno University ,Kenya
[2] Department of Economics,Maseno University ,Kenya
[3] Department of Accounting and Finance,Maseno University ,Kenya
Corresponding Author: Odongo George Otieno

Abstract: *The trend in external borrowing by Kenyan government has been increasing while economic growth has shown fluctuating trend. External debt rose from 2.04 billion in 1970 to 1.14 trillion in 2014 .Annual growth rate was 5.9% in the period 1978-1979 and dropped to 3.1% in the period 1979-2001 and later increased to 4.4% in the period 2002-2014.Following lack of consensus from empirical perspective, relationship between external budget deficit financing and economic growth is not clear. Subsequently, despite the role of external budget deficit financing to the government financing mechanisms, there are conflicting information about their effect on economic growth. The purpose of this study was to determine the effect of external budget deficit financing mechanisms on economic growth in Kenya. The study used secondary time series data for the period 1970-2014 from Economic Survey published by Kenya National Bureau Statistics. The study was guided by neoclassical growth theory and adopted correlational research design. The models were estimated using Ordinary Least Squares method. The results indicated a negative and significant effect of external budget deficit financing on economic growth (where $\beta = -0.9385; p = 0.02.$).The study recommends that policies that will promote consecutive borrowing in order to reduce the negative effect of external budget deficit financing on the economy should be adopted.*

I. Introduction

External borrowing is an important source of finance mainly used to supplement the domestic sources of funds for supporting development and other needs of a country. Usually external debt is incurred by a country which suffers from shortages of domestic savings and foreign exchange needed to achieve its developmental and other national objectives (Abu 2015). The developing countries facing current account deficit always borrow from developed countries as well as an international community to boost their economic growth. External borrowing in Kenya has been rising across the period 1970-2014. The value of external debt in 1970 was at KShs. 2040.8 million which rose to KShs. 1138504.7 million in 2014.

Economic theory suggests that reasonable levels of borrowing by developing countries are likely to enhance their economic growth. In this view Pattillo et al (2002) found that countries at early stages of development have small stocks of capital and are likely to have investment opportunities with rates of return higher than those in advanced economies. As long as they use the borrowed funds for productive investment and do not suffer from macroeconomic instability, policies that distort economic incentives, or sizeable adverse shocks, growth should increase and allow for timely debt repayments. The best known explanation comes from "debt overhang" theories, which show that if there is some likelihood that, in the future, debt will be larger than the country's repayment ability, expected debt service costs will discourage further domestic and foreign investment and thus harm growth(Krugman 1988). Potential investors will fear that the more a country produces, the more it will be taxed by creditors to service the external debt, and thus they will be less willing to incur costs today for the sake of increased output in the future.

Empirical studies have established that external borrowing can have negative or positive effects on economic growth.Nersisyan and Wray (2010) report that if debt financing is prudently pursued; it exerts positive effects on economic growth. Ceccheti and Zampoll (2011) also report that external debt exerts a positive effect on domestic savings, investment and economic growth. The same result was also found by Kasidi and said (2013) but the study by Were (2001) in Kenya found that external debt accumulation has a negative effect on economic growth. Ezeabasili et al (2011) and Kibui (2009) also found negative relationship. The study by Ogunmuyiwa (2010) on whether external debt actually promotes economic growth in developing countries using Nigeria as a case study found relationship to be weak and insignificant while the study by Makau (2008)

on external public debt on economic growth found relationship to be significant. These divergent views on the external budget deficit financing and economic growth relationship bring about the need to establish the effect of external budget deficit financing on economic growth in Kenya.

II. Review of Theoretical and Empirical studies

Theoretical literature review

Conventional view of public borrowing based on the neoclassical setting informed theoretical literature analysis in this study. According to the neoclassical theories, the growth models are augmented with variables depicting issuance of debt to finance government expenditure which include both consumption and capital goods (Adam & Bevan, 2005). At a theoretical level, much of the literature focuses on the relationship between private investment and public expenditure, mainly because of the crowding-out effect of public spending. Some of these studies such as Cordella et al, (2005) asserted that financing the budget deficit by borrowing from the public implies an increase in the supply of government bonds. To improve the attractiveness of these bonds, the government offers them at a lower price, which leads to higher interest rates. The increase in interest rates discourages issuance of private bonds, private investment, and private spending. In turn, this contributes to the financial crowding out of the private sector.

Studies of various kinds have been embarked upon on the subject matter of budget deficit financing over the years. However, differences emerged from the approach and results of the various scholars. This study focused on external budget deficit financing on economic growth in Kenya based on Neo-classical growth theory.

Empirical literature review on effect of external budget deficit financing on economic growth.

Different studies done on external financing on economic growth yield varied results. Greiner (2010) says that the outbreak of the Euro crisis following the depression has made people to realize the effect of public debt levels and debt-to-GDP ratios in both the developing and developed countries. Checcherita and Rother (2010) in an investigation of the average impact of government debt per-capita GDP growth among Euro-zone countries over the past 40 years from 1970-2009 shows non-linear negative impact of government debt on economic growth.

Rabia and Kamran (2012) examined the impact of domestic and external debt on the economic growth of Pakistan. They examined the determinants of economic growth for Pakistan, the impact of domestic debt and external debt on the economic growth of Pakistan separately over period of 1980 to 2010, using Ordinary Least Square (OLS) approach to Cointegration, Unit Root Testing, Serial Correlation Testing, test for checking Heteroskedasticity and CUSUM test of stability. The findings suggested an inverse relationship between domestic debt and economic growth and also the relationship between external debt and economic growth was found to be inverse. These relationships were found to be significant as well. The results also concluded that external debt amount slows down economic growth more compared to domestic debt amount. The negative effect of external debt is stronger on the economic growth in comparison to domestic debt. Their findings contrast the finding of Checcherita and Rother (2010) .

Ogunmuyiwa (2010) examined whether external debt actually promotes economic growth in developing countries using Nigeria as a case study. Time series data covered the years 1970-2007. The findings analyzed using regression showed that there is no causality between external debt and economic growth, and that the relationship was weak and insignificant in the Nigerian case. However, in a study carried out by Ezeabasili, Isu, and Mojekwu (2011) to investigate the relationship between Nigeria's external debt and economic growth between 1975 and 2006, a period characterized by external debt escalation using the cointegration approach, the study confirmed the existence of a one cointegrating relationship. Error estimates showed that there is a negative relationship between external debt and economic growth in Nigeria. Different findings of Ogunmuyiwa (2010) and Ezeabasili, Isu, and Mojekwu (2011) on the same country confirm lack of consensus from empirical perspectives on relationship between borrowing and economic growth.

Kasidi and Said (2013) study investigated the impact of external debt on economic growth in Tanzania over the period 1990-2010.The study used time series data on external debt and economic performance. The study revealed that there is significant impact of the external debt and debt service on GDP growth. The total external debt stock has a positive effect of about 0.36939 and debt service payment has a negative effect of about 28.517. The cointergration test shows that there is no long run relationship of the external debt and GDP. Even though the study covered the recent years, the study period was short. This study will increase the number of years because long annual time series data will enable us to establish a reliable relationship between dependent and independent variables.

In relation to Kenya Were (2001) established that low income countries classified as HIPCs have continued to experience difficulties in managing and servicing their huge stocks of external debt. Most of these countries including Kenya are in sub-Saharan Africa. The relatively high level of Kenya's external indebtedness

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and rising debt burden has serious implications on the country's development and debt sustainability initiatives. In a study examining the magnitude and structure of Kenya's external debt and its impact on growth and private investment. Using time series data covering the period between 1970 and 1995, the study confirmed external debt accumulation and its negative impact on economic growth and development.

By expanding study period compared to Were (2001), Makau (2008) did an empirical analysis on the external public debt servicing and economic growth in Kenya. The study used a single growth equation model estimated using Ordinary least Square (OLS) method with annual time series data covering the period 1970 - 2003. The findings of the study indicated that Kenya's external debt is mainly official, of which a bigger proportion is from multilateral sources. External debt accumulation has been rising over the years with debt burden indicators increasing steadily in the early 1990s. A specification associated with error correction modeling (ECM) was applied. By using Cointegration and error correction model, the study established both the short run and long run equilibrium. The estimated model was a single regression equation with the growth rate of Gross Domestic Product as the dependent variable and explanatory variables were savings as-a ratio of GDP, stock of external debt as a ratio of GDP, debt service as a ratio of GDP, interest payment as a ratio of GDP and the annual growth rate of labour force. The empirical results in the short run estimated model indicated that the coefficients of external debt to GDP, savings to GDP and debt service to GDP had the correct sign and significant while the coefficients of interest to GDP and growth in labour force were insignificant. In the long run estimated model, the coefficients of debt to GDP, debt service to GDP and savings to GDP were significant while the coefficient for growth in labour force and interest to GDP were insignificant.

Kibui (2009) studied the impact of external debt on public investment and economic growth in Kenya (1970-2007). The study used time series data for the period 1970-2007 and reduced form growth model augmented with debt variables to examine the impact of external debt on public investments and economic growth in Kenya. The findings of the study indicate that the key debt indicators have been above the critical level since 1982. The Empirical results of the time series data analysis for the period 1970-2007 indicate that debt service ratio is significant in explaining the GDP growth in Kenya. Public investment has a negative relationship with both the stock of external debt expressed as a percentage of GDP and debt service ratios. The results indicate that debt relief could act as a catalyst for investment recovery and economic growth.

The different findings of scholars confirm the contradictions in relationship between external borrowing and economic growth in different countries. The contradictions may emanate from different econometric technique used or differences across countries. Most studies even those carried in Kenya have used OLS techniques in estimation which could render the result bias even though consistent to theory according to Engle and Granger (1987). Other studies have applied time series data and panel data respectively to estimate the relationships between variables and got different results hence besides econometric methodologies, country specific empirical studies are critical to help in policy formulation.

III. Reserch Methodology

Model specification

The model was specified according to the model employed by Isu (2010) who investigated the impact of external debt on Nigeria's economic growth. However this model included Gross Domestic Product Growth rate lagged once nd Gross Domestic Product Growth rate lagged twice

$$RGDP = f \text{ (L.RGDP, L2.RGDP, EXT)} \qquad (3.6.1)$$

The econometric equation is as follows:
$$RGDP_t = \beta_0 + \beta_1 \text{ L.RGDP}_t + \beta_2 \text{ L2RGDP}_t + \beta_3 EXT_t + \beta_4 + \varepsilon \qquad (3.6.2)$$

Where: β_0 = Constant term

β = Responsiveness coefficient of the independent variable to the dependent variable.

$RGDP_t$ = Gross Domestic Product Growth rate at time t

$L.RGDP_t$ = Gross Domestic Product Growth rate lagged once at time t

$L2.RGDPt$ = Gross Domestic Product Growth rate lagged twice at time t

EXT_t = External Borrowing at time t

ε = Random error term.

t = time

To capture the elasticities of output or growth rate with respect to all the regressors, the variable EXT in the model was log transformed and the final estimate model became:

$$RGDP_t = \beta_0 + \beta_1 L.RGDP_t + \beta_2 L2RGDP_t + \beta_3 LOG\ EXT_t + \beta_4 + \varepsilon \qquad (3.6.3)$$

Data type and sources

The study used secondary annual time series data for the period covering 1970 – 2014. Data was extracted from the Economic Surveys published by the Kenya National Bureau of Statistics (KNBS)

Data analysis

The primary analytical technique that was applied for this study was the multivariate analysis comprising multiple regression and correlation. This was because the model comprised of more than two independent variables and an interplay between different independent variables also existed. The system of the equation was represented in a linear format indicated in equation (3.6.3) above. Before estimating the relationship between the variables, time series properties of data were investigated using the following test:

Test for stationarity

As a preliminary analysis, data are checked for stationarity. If the series are nonstationary, using standard econometric techniques can point to misleading results, so standard economic theory requires the variables to be stationary. The econometric methodology first examines stationarity. The augmented Dickey Fuller test was used to test for stationarity in time series. The regression equation for the ADF test of unit root can be written as follows:

$$\Delta Y_t = \alpha + \beta_t + \delta Y_{t-1} + \sum \delta \Delta Y_{t-1} + u_t \qquad (3.6.4)$$

Where
t denotes time trend,

Y is the variable in estimation procedure,

μ represent the distributed random error tem with zero value of mean and constant variance.

Assuming that μ_t is serially uncorrelated and using the AR (ρ) process, the hypothesis for the

ADF test was specified as follows;

H0: $\delta = 1$ is the Null Hypothesis implying unit root, and

H1: $\delta < 1$ is the Alternative Hypothesis implying stationary

If the null hypothesis is rejected, it implies that the variable is integrated of order zero, i.e. it is
I (0) and thus stationary. If the null hypothesis cannot be rejected then the series has a unit root i.e. it is non-stationary in levels.

OLS Estimation

This study applied Ordinary Least Squares (OLS) method to analyze the data and the results.
The method was used to estimate the relationship between dependent and the independent variables using equation 3.6.3 below.

$$RGDP_t = \beta_0 + \beta_1 L.RGDP_t + \beta_2 L2RGDP_t + \beta_3 LOG\ EXT_t + \varepsilon \qquad (3.6.3)$$

Diagnostic test

Diagnostic test establishes whether the model is consistent or not. These tests include, test for normality, serial correlation, multicollinearity test and heteroscedasticity test. To test for normality, skewness/kurtosis test for normality was used. Durbin Watson Test for Autocorrelation was used to establish whether the residual variances are correlated. Multicollinearity test is done to determine whether there exists any relationship between the explanatory variables. This study used the centered Variance Inflation Factor

to test for multicollinearity.The robust OLS estimation was conducted to account for heteroscedasticity. Correlation matrix was used to test for the implied relationship between the independent variables.

IV. Results and Discussion
Descriptive statistics
The result of the summary of descriptive statistics of the variables used is given in Table 1 below. The variable EXT is in million Kenya shillings. RGDP is annual growth rate (%).

Table 1 Descriptive statistics

Statistics	RGDP	EXT
MEAN	4.16	231,751.80
STANDARD DEVIATION	2.01	266,941.10
SKEWNESS	-0.470	1.370
KURTOSIS	2.088	4.692

Key: RGDP=Growth rate EXT=External budget deficit financing,
Source: Study data

It is observed from the Table 1 above that the RGDP for Kenya has a mean annual growth of 4.16%; EXT has a mean of 231,751.80; over the study period of 45 years.

Standard deviation is a measure of the dispersion of a set of data from its mean. The more spread apart the data, the higher the deviation. From Table 1 above, the standard deviation of the variables RGDP, EXT, were 2.01 and 266,941.10 respectively.

Skewness defines the extent to which a distribution differs from a normal distribution. They are measures of normality of the distribution. A normal distribution often rotates around zero. A positive skew means that the mean is greater than the mode while a negative skew means that the mean is less than the mode. From the results above, all the parameters are positively skewed and regarding the normality of the distribution, the statistics indicates that all the variables namely RGDP, EXT, were not normally distributed as the value for the skews deviated away from zero at-0.470 and 1.370 respectively.

Kurtosis measures the thickness or the thinness of the distribution's tail. They are also a measure of normality of the distribution. The kurtosis of a normal distribution is always 3. If it is more than 3, then the distribution has a thick tail but if it is less than 3, the distribution has a thin tail. From the Table 1 above, the variable EXT has a kurtosis greater than 3 i.e. 4.692 meaning that it had a thick tail (Leptokurtic) while the kurtosis of RGDP had a value of less than 3 (2.088) i.e. it had a thin tail (platykurtic).

Correlation of the variables
Correlation test was done to study the linear association between the dependent and the independent variables. Correlation coefficient falls between -1 and +1. There is a strong (-, +) correlation if the level of association exceeds 0.5 and approaches 1. Below 0.5, the correlation is a weaker one. Negative correlation means that the variables move in a linear format but in the opposite direction whereas a positive correlation means that the variables move in a linear format in the same direction. Table 4.3.1 below shows the kind of associations that existed between RGDP and EXT

Table 2: Correlation matrix

	RGDP	L.RGDP	L2.RGDP	EXT
RGDP	1.0000			
L.RGDP	0.4854 (0.00)	1.0000		
L2.RGDP	0.1726 (0.27)	0.4787 (0.00)	1.0000	
EXT	0.0254 (0.87)	-0.0382 (0.81)	-0.1351 (0.39)	1.0000
INT	0.1345 (0.38)	0.0849 (0.58)	0.0135 (0.93)	0.9578 (0.00)
EXT-INT	-0.3012 (0.04)	-0.2473 (0.1055)	-0.2657 (0.09)	-0.0712 (0.64)

Key: RGDP=Growth rate L.RGDP Growth Rate lagged once. L2.RGDP Growth Rate lagged twice EXT=External budget deficit financing,
Source: Study data

Results portrayed in Table 2 indicate the degree of correlation as well as the statistical significance represented by the probabilities. From the results, both economic growths lagged once (L.RGDP) and twice (L2.RGDP) showed positive association with economic growth (where$\beta = 0.4854; p = 0.00$.) and (where$\beta = $

$0.4854; p = 0.00.$) respectively, but economic growth lagged once had a significant correlation while lagged twice shown insignificant correlation. External budget deficit financing (EXT) had insignificant positive association with economic growth RGDP.(where $\beta = 0.0254; p = 0.87.$)for external budget deficit financing

Stationarity test

It is necessary to verify the stationarity properties of variables included prior to attempting an econometric analysis. This is vital because econometric analysis of non stationary variables affects the efficiency and consistency of estimation results (Granger, 1974). To determine the order of integration, Augmented Dickey Fuller (ADF) unit root test and the Phillips-Perron (PP) unit root test were carried out on levels and differences for variables used in both models. The null hypothesis underlying unit root testing is that the variable under investigation has a unit root (non-stationary) and the alternative is that it does not (stationary) (Dick and Fuller, 1979). The results of the unit root test for variables used in the analysis in their log form are reported in Table 3 and Table 4 below

Table 3: PP Unit Root Test of Variables at Levels & Difference with Trend included

At Levels with Trend						Differenced with Trend					
Variable	Test-statistic	P-Value	5% Critical Value	No. of lags	I(d)	Variable	Test-statistic	P-Value	5% Critical Value	No. of lags	I(d)
RGDP	-3.745	0.02	-3.524	3	I(0)	DRGDP	-8.621	0.00	-3.528	3	I(1)
LOGEXT	-1.128	0.92	-3.524	3		DLOGEXT	-6.912	0.00	-3.528	3	I(1)

Mackinnon approximate p-values are used.

Table 4: ADF Unit Root Test of Variables at Levels & Difference with Trend included

At Levels with Trend						Differenced with Trend					
Variable	Test-statistic	P-Value	5% Critical Value	No. of lags	I(d)	Variable	Test-statistic	P-Value	5% Critical Value	No. of lags	I(d)
RGDP	-2.559	0.30	-3.536	3		DRGDP	-4.814	0.00	-3.540	3	I(1)
LOGEXT	-1.406	0.86	-3.524	3		DLOGEXT	-4.197	0.00	-3.532	1	I(1)

Mackinnon approximate p-values are used.
Source: Study data

The PP unit root test in Table 3 above show that at levels we cannot reject the null hypothesis of unit root for the variablesRGDP implying that it was non-stationary. LOGEXT was nevertheless stationary at levels. However, the null hypothesis of unit root test applied to the variables in their first differences was rejected for all the variables showing that they were stationary and integrated of order I (I).The ADF unit root test in Table 4 show that at levels LOGEXT was stationary. The null hypothesis of unit root test applied to the variables in their first differences was rejected for all the variables showing that they were stationary and integrated of order I(I).Inferring from the results in Table 3 and Table 4 above, we can conclude that all the variables are stationary at first difference and are integrated of the same order (order I(I))

OLS ESTIMATION

Multiple regression analysis was conducted where RGDP was regressed against LOGEXT, L.RGDP and L2.RGDP to determine the kind of relationship that exists between RGDP and each of the independent variables LOGEXT, L.RGDP and L2.RGDP and the results presented in Table 5 below.

Table 5 Ordinary Least Square

LINEAR REGRESSION					No. of Obs	43
					F(4,38)	5.67
					Prob	0.00
					R-Squared	0.297
Robust					Root MSE	1.771
Dependent Variable : RGDP	oef.	Std.Err	t	P	95% Conf. Interval	
L.RGDP	0.4378	0.155	2.83	0.01	0.125	0.751
L2. RGDP	-0.1728	0.185	-0.94	0.36	-0.547	0.201
LOGEXT	-0.9385	0.372	-2.52	0.02	-1.692	-0.185
CONS	4.7238	2.263	2.09	0.04	0.144	9.304

Key: RGDP=Growth rate L.RGDP Growth Rate lagged once. L2.RGDP Growth Rate lagged twice LOGEXT= Log of External budget deficit financing,
Source: Study data

The tables present the robust OLS estimates of effect of external budget deficit financing on economic growth. The robust OLS estimates accounts for heteroscedasticity in the model. From table 5, the coefficient of determination (R^2) is 0.297 meaning that the 29.7% of the variations in the dependent variable are explained by the independent variables. The remaining 70.3% can be attributed to factors beyond the scope of this study. Regression model is statistically significant, $F(4,38)=5.67$, p=0.000. This indicates that, overall, the model applied can statistically and significantly predict the dependent variable. The ρ values for LOGEXT and L.RGDP were below the critical value of 0.05, the results concluded that LEXT and L.RGDP were significant in determining RGDP while the ρ values for L2. RGDP was above the critical value of 0.05; the result concluded that L2. RGDP was insignificant in determining RGDP.

From the Table 5 external deficit financing have significant effect on economic growth. External deficit financing (EXT) has a negative effect on economic growth (RGDP) (where $\beta = -0.9385; p = 0.02$.) This indicates that a percentage increase in external deficit financing reduces economic growth by 0.93% annually. Also, from the same table, RGDP lagged once (L.RGDP) has significant positive effect on economic growth (RGDP). (where $\beta = 0.4378; p = 0.01$.).This indicates that past growth positively affect current growth by 0.43% annually.

The objective of the study was to determine the effect of external budget deficit financing on economic in Kenya. The result revealed that there was statistically significant negative relationship between external budget deficit financing and economic growth. The coefficient indicates a percentage increase in external deficit financing reduces economic growth by 0.93% annually in Kenya. The results were in agreement with what Ezebiasili et al (2011) in the study of Nigeria found and also what Rabia and Kamran (2012) in the study of Pakistan found. Their studies concluded that external budget deficit financing have significant negative effect on economic growth.

Diagnostic tests
Multicollinearity

This refers to a statistical phenomenon where two or more independent variables are highly correlated making it difficult to isolate the effect of one of the variables upon the dependent variable. Multicollinearity is a problem of degree. When the correlations among the independent regression variables are minor, the effects may not be serious. A higher degree of Multicollinearity may have an adverse effect on the regression results leading to unreliable regression estimates (although, unreliability does not mean that the estimates are poor) and its presence can be depicted by highly estimated standard errors and high R^2 (Gujarat, 2004). To detect Multicollinearity, correlation analysis among the independent variables was analyzed. The one with the highest P-value from the correlation matrix is to be dropped since as the P-value goes up, the level of significance goes down. The study used centered Variance Inflation Factor (VIF) and the results were shown below:

Table 6 Variance Inflation Factor Multicollinearity

Variable	VIF	1/VIF
LOGEXT	12.050	0.083
L.RGDP	1.49	0.671
L2.RGDP	1.37	0.729
Mean VIF	4.97	

Source: Study data
The mean VIF 4.97 indicates that there is no multicollinearity among the variables.

Serial correlation

This refers to a situation whereby an error term in one period is correlated with another error term in another period. This was used to measure whether the covariance and the correlations between different disturbances are no longer non-zero. This is because in time series data, there are tendencies for random shocks or disturbances that spill over from one time period to the next. This was done using Durbin Watson Test For Autocorrelation and the results shown below:

Table7 Durbin Watson Test for Autocorrelation for model 1

Durbin Watson d-Statistic (5,43)= 2.063	

Source: Study data
The statistic indicated there is no autocorrelation.

Skewness/ kurtosis test for normality

In theskewness/kurtosis test for normality when p value > 0.05 means the null hypothesis (that the distribution is normal) is accepted and when p<0.05 means that the null hypothesis is rejected and the distribution is not normal.

Table 8 Skewness/ kurtosis test for normality

Variable	Obs	Pr (Skewness)	Pr (Kurtosis)	Adj Chi2(2)	Prob
RGDP	45	0.0005	0.0309	13.16	0.0014
EXT	45	0.0000	0.0019	21.92	0.0000

Source: Study data

The variables RGDP and EXT show statistically significant lack of normality.

V. Conclusions and Recommendations

It can be concluded that external budget deficit financing has a significant negative effect on economic growth in Kenya. Based on the findings of this study, the government should adopt policies that will promote consecutive borrowing in order to reduce the negative effect of external budget deficit financing on the economy. In this regard the government should find ways of enhancing its revenue generation capacity especially by broadening the tax base to reduce the deficit which is financed by budget deficit financing.

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