



# EFFECT OF INTERNAL BUDGET DEFICIT FINANCING ON ECONOMIC GROWTH IN KENYA

Odongo George Otieno<sup>1\*</sup>, Scholastica Odhiambo<sup>2</sup>, Benjamin Ombok<sup>3</sup>

<sup>1\*,2</sup> Department of Economics, Maseno University, Kenya

<sup>3</sup> Department of Accounting and Finance, Maseno University, Kenya

**ABSTRACT:** Economic growth is an increase of a country's output of goods and services commonly financed by internal and external sources some of which comprise public borrowings. Internal borrowing by Kenyan government has been increasing while economic growth has shown fluctuating trend. Internal debt rose from 1.16 billion in 1970 to 1.08 trillion in 2014 while 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. Despite the role of internal budget deficit financing to the government financing mechanisms, there are conflicting information about its effect on economic growth based on lack of consensus from empirical perspective. The purpose of this study was to determine the effect of internal budget deficit financing 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 positive and significant effect of internal budget deficit financing on economic growth (where  $\beta=0.8302$ ;  $p=0.03$ ). The study recommends that 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 internal borrowing.

**Keywords:** Budget Deficit, Internal Budget Deficit Financing, Economic Growth.

## 1. INTRODUCTION

### 1.1. Background of the Study

There are several reasons of public internal debt. First, it is used to finance the budget deficit when the government is not able to meet its expenditure commitments using domestically raised revenue and externally sourced grants and borrowing. Second, internal debt is contracted during implementation of monetary policy through open market operations. Third, debt instruments are important in financial markets development (Sheikh *et al.*, 2010). Kenyan government has majorly resorted to internal borrowing to finance budget deficit. However the main challenge of government borrowing internally to cover a growing budget deficit is the accumulation of internal debt (Beaugrand *et al.*, 2002). Internal borrowing in Kenya has been rising across the period 1970-2014. The value of domestic debt in 1970 was KShs. 359.80 million which rose to KShs. 1078807.30 million in 2014. The expectation is that the rise in domestic borrowing should have achieved a steady rise in economic growth.

According to Cashell (2007), the impact of internal public debt on economic growth of many nations remains a controversial issue in both academic and policy making fora. This is because empirical reviews do not bring out clear indication on the relationship between internal budget deficit financing and economic growth. Abbas (2007), Maana *et al.* (2008), and Putunui and Mutuku (2013) found positive relationship while Muhdi and Sasaki (2009), Sheikh *et al.* (2010) and Onyeiwu (2012) found a negative relationship. It is evident that there is lack of consensus on the relationship between internal budget deficit financing and economic growth from the findings of above scholars. This study therefore sought to fill this research gap by investigating the effect of internal budget deficit financing on economic growth in Kenya.

## **1.2. Statement of the Problem and Objective of the Study**

The relationship between budget deficit financing and economic growth has become a major economic and political issue in all the world economies. The target of achieving sustainable growth and of maintaining macroeconomic stability is the dream of many developed, developing and underdeveloped economies. The Kenyan government has persistently failed to collect adequate resources to finance its budget. Consequently, the government has had to borrow to finance the budget deficits. The available information reveal trend of increasing internal budget deficit financing in Kenya from 1970 to 2014. Whereas this implies increased financial boost to the diverse projects financed by the exchequer, economic growth has however continued to register fluctuating performance coupled with rising cost of living. It is also evident that there is lack of consensus on the effect of internal budget deficit financing on economic growth from the findings of different scholars. Thus the motivating question arises as to whether financing budget deficits by borrowing from the domestic market have had any adverse effects on economic growth in Kenya. The purpose of this study was to examine the effect of internal budget deficit financing on economic growth in Kenya.

## **1.3. Theoretical Framework**

This study was modeled on the neoclassical growth theory. The neoclassical growth theory which has its origin from the Harrod Domar 1956 model explains the relationship between investment, growth rate and employment in an economy. According to this theory, production capacity is proportional to capital stock. [Solow \(1956\)](#) in his contribution to economic growth focused on the process of capital formation and assumed that production was a function of capital, labor and technology.

This relationship can be written as follows:  $Y = f(A, K, L)$  where  $Y$  is aggregate output,  $A$  is a number based on the current state of technology,  $K$  is a quantitative measure of the size of the stock of manufactured capital, and  $L$  the quantity of labor used during that period of time  $K$ ,  $A$  and  $L$  are the only factors of production explicitly included in the model. All factors are needed for the production of output, with the exponents in the equation reflecting their relative contributions. An increase in growth output results from increases in production factors (physical capital and labor) and productivity, which rises as a result of technological change, including changes in organization and practices.

This model has three important assumptions. First, increasing capital relative to labour creates economic growth, since people can be more productive given more capital. Second, poor countries with less capital per person will grow faster because each investment in capital will produce a higher return than rich countries with ample capital. Third, because of diminishing returns to capital, economies will eventually reach a point at which any increase in capital will no longer create economic growth. This point is called "steady state".

According to [Solow \(1956\)](#) neoclassical model a country will attain economic growth if it increases its savings and investments. This automatically implies that for the least developed countries to grow economically they need to implement policies that support greater savings which will then increase investment and hence growth. Due to limited revenue streams of developing countries, an external source is needed for greater investment and growth. This argument implies that foreign savings complement domestic savings and investments [Eaton \(1993\)](#). In this connection, debt can potentially help foster higher economic growth, provided that it is used to help finance investment. Debt is taken as capital inflow with a positive effect on domestic saving and investment and thus growth. This theory was relevant to this study considering the fact that if public debt is borrowed for financing education, health and development investments, it is considered to be productive and expected to positively contribute to economic growth through improved capital, labour and technology. This will result to an increase in government spending. So instead of having the function  $Y = f(A, K, L)$  now the function was written as:  $RGDP = f(INT)$  Where  $RGDP$  is gross domestic product growth rate,  $INT$  is internal budget deficit financing.

## **2. RESEARCH METHODOLOGY**

### **2.1. Research Design**

The study was conducted based on correlational design. Correlation method determines whether or not two variables are correlated. This means to study whether an increase or decrease in one variable corresponds to an increase or decrease in the other variable. It involves collecting data in order to determine whether and to what degree a relationship exists between two or more quantifiable variables [Mugenda \(2008\)](#). It enabled the establishment of strength and sign of the relationship between internal budget deficit financing and economic growth.

## 2.2. Model Specification

The model that the study used was borrowed and modified from the model employed by Isu (2011) who investigated the impact of external debt on Nigeria's economic growth. However this model focused on internal debt and included Gross Domestic Product Growth rate lagged once and Gross Domestic Product Growth rate lagged twice.

$$RGDP_t = f(L.RGDP_t, L2.RGDP_t, INT_t) \quad (2.2.1)$$

The econometric equation is as follows:

$$RGDP_t = \beta_0 + \beta_1 L.RGDP_t + \beta_2 L2.RGDP_t + \beta_3 INT_t + \varepsilon \quad (2.2.2)$$

Where:  $\beta_0$  = Constant term

$\beta$  = 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

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

$INT_t$  = Internal Borrowing at time t

$\varepsilon$  = Random error term.

t = time

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

$$RGDP_t = \beta_0 + \beta_1 L.RGDP_t + \beta_2 L2.RGDP_t + \beta_3 LOGINT_t + \varepsilon \quad (2.2.3)$$

## 2.3. Data Collection Methods

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) using data schedule.

## 2.4. Sample Design and Sample Size

The sample size in this study consisted of annual time series data set for a period of 45 years spanning from 1970-2014. This was aimed at achieving a comprehensive coverage and gives much accurate results.

## 2.5. Data Analysis

The primary analytical technique that was applied for this study was the multivariate analysis comprising multiple regression and correlation. The system of the equation was represented in a linear format indicated in equation (2.2.3) above. Before estimating the relationship between the variables, time series properties of data were investigated using the following test.

### 2.5.1. Test 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:

$$\Delta Y_t = \alpha + \beta_t + \delta Y_{t-1} + \sum \delta \Delta Y_{t-1} + u_t \quad (2.5.1)$$

Where

t denotes time trend,

Y is the variable in estimation procedure,

$\mu$  represent the distributed random error term with zero value of mean and constant variance.

Assuming that  $\mu_t$  is serially uncorrelated and using the AR (p) 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.

### 2.5.2. OLS Estimation

Ordinary Least Squares (OLS) method was used to estimate the relationship between dependent and the independent variables using equation (2.2.3) below.

$$RGDP_t = \beta_0 + \beta_1 L.RGDP_t + \beta_2 L^2RGDP_t + \beta_3 LOGINT_t + \varepsilon \quad (2.2.3)$$

### 2.5.3. 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.

## 2.6. Data Presentation

The study applied descriptive techniques such as graphs, charts and tables to present the results of the study. Tables were used to guide readers in making quick comparison and ease understanding of the relationship between the variables.

## 3. RESULTS AND DISCUSSION

### 3.1. Descriptive Statistics

The result of the summary of descriptive statistics of the variables used is given in Table 3.1 below. The variable INT is in million Kenya shillings while RGDP is annual growth rate (%)

**Table 3.1. Descriptive statistics**

Statistics	RGDP	INT
MEAN	4.16	163,209.10
STANDARD DEVIATION	2.01	254,957.70
SKEWNESS	-0.470	2.020
KURTOSIS	2.088	6.591

Key: RGDP=Growth rate, INT= Domestic budget deficit financing

Source: Study data

It is observed from the Table 3.1 above that the RGDP for Kenya has a mean annual growth of 4.16% while INT has a mean of 163,209.10 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 3.1 above, the standard deviation of the variables RGDP and INT were 2.01 and 254,957.70 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 and INT were not normally distributed as the value for the skews deviated away from zero at -0.470 and 2.020 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 above, the variable INT had a kurtosis greater than 3 i.e 6.591 meaning that it had a thick tail (Leptokurtic) while RGDP had a value less than 3 ( 2.088) i.e. it had a thin tail (platykurtic).

### 3.2. 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 3.2 below shows the kind of associations that existed between the RGDP, INT, INV, L.RGDP and L2.RGDP.

**Table 3.2. Correlation matrix**

	RGDP	L.RGDP	L2.RGDP	INT
RGDP	1.0000			
L.RGDP	0.4854 (0.00)	1.0000		
L2.RGDP	0.1726 (0.27)	0.4787 (0.00)	1.0000	
INT	0.1345 (0.38)	0.0849 (0.58)	0.0135 (0.93)	1.0000

Key: RGDP=Growth rate L.RGDP Growth Rate lagged once. L2.RGDP Growth Rate lagged twice  
INT= Internal budget deficit financing,

Source: Study data

Results portrayed in Table 3.2 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  $\beta = 0.1726; p = 0.27.$ ) respectively, but economic growth lagged once had a significant correlation while lagged twice shown insignificant correlation. Internal budget deficit financing (INT) had insignificant positive association with economic growth RGDP (where  $\beta = 0.1345; p = 0.38.$ ).

### 3.3. Stationarity Test

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) (Dickey and Fuller, 1979). The results of the unit root test for variables used in the analysis in their log form are reported in Table 3.3.1 and Table 3.3.2 below.

**Table 3.3.1. 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)
LOGINT	-3.681	0.02	-3.524	3	I(0)	DLOGINT	-7.095	0.00	-3.528	3	I(1)

Source: Mackinnon approximate p-values are used.

**Table 3.3.2. 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)
LOGINT	-4.334	0.00	-3.536	3	I(0)	DLOGINT	-5.455	0.00	-3.540	3	I(1)

Mackinnon approximate p-values are used.

Source: Study data

The PP unit root test in Table 3.3.1 above show that at levels we cannot reject the null hypothesis of unit root for the variables RGDP and LOGINT implying that they were non-stationary. 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 3.3.2 show that at levels we cannot reject the null hypothesis of unit root for RGDP implying that it was non-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 3.3.1 and 3.3.2 above, we can conclude that all the variables are stationary at first difference and are integrated of the same order (order I(I))

### 3.4. OLS Estimation

This method was used to estimate the relationship between RGDP and the independent variables. The robust OLS estimation was conducted to account for heteroscedasticity in the model and the results presented in the table 3.4 below.

**Table 3.4. 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	coef.	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
LOGINT	0.8302	0.374	2.22	0.03	0.073	1.587
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 ,LOG INT= Log of Internal budget deficit financing

Source: Study Data

The tables present the robust OLS estimates of effect of internal budget deficit financing on economic growth. The robust OLS estimates accounts for heteroscedasticity in the model. From table 3.4 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  $\rho$  values for LOGINT and L.RGDP were below the critical value of 0.05, the results concluded that L.RGDP and LINT were significant in determining RGDP while the  $\rho$  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 3.4, internal deficit financing has significant effect on economic growth (where  $\beta = 0.8302$ ;  $p = 0.03$ ). This shows that a percentage increase in internal deficit financing raises economic growth by about 0.83% 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 internal budget deficit financing on economic growth in Kenya. From the result internal budget deficit financing has positive significant effect on economic growth in Kenya. A percentage increase in internal deficit financing raises economic growth by about 0.83% annually. The result was in agreement with what Putunui and Mutuku (2013) in the study of Kenya found. Their study all concluded that domestic budget deficit financing have significant positive effect on economic growth.

### 3.5. Diagnostic Tests

#### 3.5.1. Multicollinearity

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 3.5.1.** Variance Inflation Factor Multicollinearity

Variable	VIF	1/VIF
LOGINT	10.90	0.092
L.RGDP	1.49	0.671
L2.RGDP	1.37	0.729
Mean VIF	4.59	

**Source:** Study Data

The mean VIF 4.59 indicates that there is no multicollinearity among the variables.

### 3.5.2. Serial Correlation

This was used to measure whether the covariance and the correlations between different disturbances are no longer non-zero. This was done using Durbin Watson Test for Autocorrelation and the results shown below:

**Table 3.5.2.** Durbin Watson Test for Autocorrelation for model 1

Durbin Watson d-Statistic (5,43)= 2.063	
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**Source:** Study data

The statistic indicated there is no autocorrelation.

### 3.5.3. Skewness/ Kurtosis Test for Normality

In the skewness/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 3.5.3. 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
INT	45	0.1610	0.0761	5.02	0.0814

**Source:** Study data

The variables RGDP show statistically significant lack of normality.

## 4. CONCLUSIONS AND RECOMMENDATIONS

### 4.1. Conclusion

The objective of the study was to determine the effect of internal budget deficit financing on economic growth in Kenya. . The regression results showed that, internal budget deficit financing has a positive significant effect on economic growth (where  $\beta = 0.8302$ ;  $p = 0.03$ .). It can be concluded that internal budget deficit financing has a significant negative effect on economic growth in Kenya.

### 4.2. Recommendations

The study recommends that 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 internal borrowing.

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