

## **The Causal Relationship between Government Revenue and Expenditure in the Determination of Budget Deficit in Sri Lanka**

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### **Introduction**

The total government revenue which heavily depends on tax revenue and the total expenditure as a percentage of GDP is continuously declining over the past few years in Sri Lanka. However, the budget deficit as a percentage of GDP has not been reduced commensurately and still remains high (CBSL, 2014). It shows that the failure of fiscal policy makers to understand the relationship between government expenditure and revenue, and to manage the budget deficit appropriately. Ravinthirakumaran (2012) suggested that the government decisions on revenue and expenditure are jointly made by the fiscal policy makers. However he asked that why the budget deficit remains high and it is not properly addressed. Another study by Kesavarajah (2012) found that various types of fiscal expenditures have different degree of impacts on economic growth. The author sheds some lights on the significant potential to improve growth efficiency of fiscal spending and thereby improve tax revenues. Although the relationship between government revenue and expenditure has been attracted by previous researchers attention has not been made adequately to explore the particular aspect referring in the determination of the budget deficit in Sri Lanka that focusing in this study.

Therefore this study attempts to examine the interrelationship between government revenue and expenditure drawing particular attention on the impact of some selected variables, such as

expenditures for education, health, defense and unemployment as major components that basically causing the persistent budget deficit of Sri Lanka.

### **Objectives**

The primary objective of this research is to identify the causal relationship between government revenue and expenditure in the determination of budget deficit in Sri Lanka. Also this study investigates the reasons for budget deficit continue to be high as a percentage of GDP and to provide implications on failure to manage such expenditures and to keep the budget deficit at a manageable level.

### **Methodology**

In order to achieve the above objectives, this study uses data from Sri Lanka over the period of 1990-2014. The data were extracted from various issues of the Central Bank of Sri Lanka annual reports. Government expenditure and revenue are converted in to natural logarithm.

ADF test is used to test the stationarity property of time series data and Granger causality test is adapted to identify the direction of causality between variables.

In order to identify the long run relationship between the variables, Engle-Granger co-integration technique is employed which can be specified as follows:

$$\text{LREV}_t = \beta_0 + \beta_1 \text{LEXP}_t + U_t \quad (1)$$

$$\text{LEXP}_t = \beta_0 + \beta_1 \text{LREV}_t + U_t \quad (2)$$

Where, LREV is the log value of government revenue and LEXP is the log value of government expenditure

This study adopts a multiple regression model to estimate the determinants of budget deficits in Sri Lanka. The model can be specified as follow:

$$BD_t = \beta_0 + \beta_1 UNEMP_t + \beta_2 EDU_t + \beta_3 HEL_t + \beta_4 MIL_t + U_t \quad (3)$$

Where;  $BD_t$  is the budget deficit as a percentage of GDP,  $UNEMP_t$  is the unemployment rate  $EDU_t$  is the government expending on education as a percentage of GDP,  $HEL_t$  is the government expending on health as a percentage of GDP,  $MIL_t$  government expending on Military as a percentage of GDP and  $U_t$  error term with zero mean and constant variance. All variables values are given in percentage.

### Results and Discussion

The unit root tests confirmed that all variables are stationary at their first difference, suggesting that they are integrated in order one [I(1)]. In order to determine the causality relationship between the variables, granger causality test was used. The results of granger causality test are presented in Table 1.

Table 1: Results of Granger Causality Test

Null hypothesis ( $H_0$ )	obs	F-Statistic	Prob
LREV does not Granger Cause LEXP	23	3.18405	0.0655
LEXP does not Granger Cause LREV	23	2.24260	0.0512

As shown in Table 1, in both cases we reject null hypothesis at 10% suggesting that LREV granger causes LEXP and LEXP granger causes LREV. It revealed that there is a bi-directional causality relationship between government revenue and expenditure in Sri Lanka.

Since both variables are I(1) and error term is I(0) suggesting to test the co integration in order to identify the long run relationship. The results are given below.

$$\text{LREV} = 0.067 + 0.966\text{LEXP}$$

$$\text{P value} = (0.000)$$

The results reveal that there is a positive and significant relationship between LEXP and LREV in the long run. That is 1% increases in LEXP raises the LREV by 0.96%.

$$\text{LEXP} = -0.0297 + 1.0316\text{LREV}$$

$$\text{P value} = (0.000)$$

The results reveal that there is a positive and significant relationship between LREV and LEXP in the long run. That is 1% raises in LREV increases the LEXP by 1.031%.

When we consider a multi regression model, the results of the model is given in Annex 1.

According to the results of multiple regression model (given in Annexure in Table 3) the variables unemployment rate, education expenditure and Health expenditure are not statistically significant at any level in determining the budget deficit of Sri Lanka whereas military expenditure has a statistically significant impact on budget deficit of Sri Lanka. That is when military expenditure increases by 1% the budget deficit increase by 0.627%. Since the  $R^2$  value of this model is 0.287 suggesting that total variation of budget deficit explain by the variables included in the model only 28.7 %. This concludes that the model is not enough to explain the variation of budget deficit.

## **Conclusion**

The empirical results indicate that bidirectional causality relationship exists between government revenue and expenditure in Sri Lanka. This suggests that there exist a feedback mechanism between revenue and expenditure for Sri Lanka. It means both revenue and

expenditure levels affect each other so that higher tax level are caused by higher spending levels and vice-versa. Under this scenario the fiscal authority should raise revenue and decrease expenditure simultaneously to manage budget deficits. This implies that government revenue and expenditures decisions should be jointly taken by the fiscal policy makers.

The expenditures on education and health and employment rate are not significant variables to determine budget deficit whereas military expenditure still highly contributes to budget deficit in Sri Lanka. Therefore the study recommends allocating more on education and health which lead to improve human capital and thereby raising tax revenues through economic growth to manage the budget deficit in the long run.

### **Reference**

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## Appendix

Table 1: Results of Multiple Regression Model

Variables	Coefficient	S.E	P value
Constant	-5.603	-5.603	0.024
UNEMP	-0.229	0.171	0.195
EDU	1.801	1.661	0.291
HEL	-1.478	1.987	0.465
MIL	-0.627	0.269	0.030*

$R^2 = 0.287$ ,

Note: \* represents the variable is significant at 5%.

Table 2: Results of Co-integration Test

Dependent Variable: LREV

Method: Least Squares

Date: 06/04/15 Time: 15:22

Sample: 1 25

Included observations: 25

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LEXP	0.966422	0.011189	86.36918	0.0000
C	0.067401	0.145668	0.462704	0.6479

Dependent Variable: LEXP

Method: Least Squares

Date: 06/04/15 Time: 08:39

Sample: 1 25

Included observations: 25

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LREV	1.031564	0.011944	86.36918	0.0000
C	-0.029608	0.151070	-0.195989	0.8463

Table 3: Results of Multiple Regression Model

Dependent Variable: BUDGET\_DEFICIT

Method: Least Squares

Date: 06/04/15 Time: 10:43

Sample: 1990 2014

Included observations: 25

Variable	Coefficient	Std. Error	t-Statistic	Prob.
EDUCATION	1.801025	1.660936	1.084343	0.2911
HEALTH	-1.478426	1.986761	-0.744139	0.4654
MILITARY_EXPENDITURE	-0.627217	0.268591	-2.335208	0.0301
UNEMPLOYMENT	-0.228946	0.170798	-1.340450	0.1951
C	-5.603084	2.302903	-2.433053	0.0245
R-squared	0.287581	Mean dependent var		-7.744000
Adjusted R-squared	0.145097	S.D. dependent var		1.274454
S.E. of regression	1.178373	Akaike info criterion		3.343002
Sum squared resid	27.77124	Schwarz criterion		3.586778
Log likelihood	-36.78753	Hannan-Quinn criter.		3.410615
F-statistic	2.018339	Durbin-Watson stat		1.762266
Prob(F-statistic)	0.130533			