The Impact of Government Expenditure on Economic Growth in Sri Lanka: An Econometric Analysis

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Abstract

Over the decades, in many developing countries the government sector plays a vital role in promoting economic growth and development. In a general view, the government sector tries to achieve its macroeconomic objectives through its fiscal and monetary policy. However, in macroeconomics, the increasing government expenditures and its impacts on long-run economic growth arouses a great issue theoretically as well as empirically. This study examines the effects of government expenditure on economic growth in Sri Lanka over the period 1977-2009. This study seeks to investigate the impact of specific government expenditure components including, education, health, defense and transport and communication. In this context, the present study employed a multivariate co-integration and error correction modeling technique by utilizing the time series annual data drawn from the Central Bank of Sri Lanka various annual reports. The empirical evidence from the study suggests that the existence of long run dynamic relationship among the variables. Further the study reveals that, the expenditure on education has a significant positive impact on economic growth while, defense and health expenditure has a significant negative impact on economic growth in Sri Lanka. Therefore, the implication from this study is the allocation of government expenditure towards the education sector is an important key to economic growth in the long run in Sri Lanka.

Key words: economic growth, government expenditure, co-integration, and Sri Lanka.

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Introduction

Over the decades, government sector plays a significant role in promoting economic growth and development in both developed and developing countries of the world. Particularly with the global economic recession in 1930s, the role of government sector in the economic activity was generated considerable interest among policy makers. Since then, every country had tried to achieve economic growth through the increase in government expenditures. Despite the government sector tries to achieve its macroeconomic objectives through its fiscal and monetary policy, the impacts of government expenditures on economic growth arouses a great issue theoretically as well as empirically.

The size of government expenditures and its impact on economic growth has emerged as a major public choice issue facing economies in transition [Devarajan, 1995]. Although the financing of government expenditures can be growth retarding, in a general view, the provision of social and physical infrastructure through government expenditure can improve productivity through a more efficient allocation of resources. In a small country like Sri Lanka, the issues on government expenditure among different sectors are of special policy relevance, since it directly related with the country's economic growth and development. Since the economic liberalization and other market-oriented reforms, Sri Lanka has come almost full circle with respect to economic policy regimes and experienced a decreasing trend in government expenditure with the pattern of the composition of expenditure changes.

Many studies have attempted to examine the impact of government expenditures on economic growth in Sri Lanka. A few of them identified positive and significant relation between government expenditures and economic growth, while some of them found negative or no relation. Among the related studies, few studies attempted to examine expenditure on defense and education individually on economic growth. However, this study differs from the previous studies since the government expenditure includes, expenditures on defense, education, health and transport and communication. Further, this study uses co-integrating and error correction modeling technique and incorporating more recent data set. Moreover, the present study tries to identify whether the above components of government expenditure has plays an important role in promoting economic growth in Sri Lanka over the period and attempt to identify the real parameters.

The objective of this study is to examine the impact of government expenditure on economic growth in Sri Lanka over a period from 1977 to 2009, with the particular focus on specific government expenditure components such as, education, defense, health and transport and communication. Moreover, to test the existence of long run co-integrating relationship among variables in the model, this study has applied the Johansen multivariate co-integrating and error correction methodology. The major limitation of the study is that, it does not consider the potential impact of the other factors that could contribute towards economic growth. And the sample period also limited since it considers economic growth and the government expenditure only post economic liberalization period.

The rest of the paper is organized as follows: section two reviews some empirical literature, and section three presents and overview of government expenditure and economic growth in Sri Lanka, and section four present the data and methodology used in this study and empirical results are discussed subsequently. Concluding remarks are presented in the last section.

Literature Review

A Large number of studies have attempted to examine the impact of government expenditure on economic growth in both developed and developing countries and many literatures on government expenditure and economic growth provides mixed evidence. Landau (1986) concluded that government expenditure of education, defense and capital development had a weak or even no impact on economic growth. Ranjan and Sharma (2008) examined the effect of government development expenditure on economic growth during the period 1950-2007 in India. The authors discovered a significant positive impact of government expenditure on economic growth. They also reported the existence of co integration among the variables. Castles and Dowrick (1990) used the shares of disaggregated government expenditure in health, education and social transfers in GDP to explain economic growth. They found that social transfers and education had a positive effect on growth. Devarajan, Swaroop, and Zou (1996) also assessed the impact of different types of government expenditure on economic growth and they did not find any significant link.

Komain and Brahmasrene (2007) examined the relationship between government expenditures and economic growth in Thailand, by employing the granger causality test. The results revealed that government expenditures and economic growth are not co-integrated. Moreover, the results

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indicated a significant positive effect of government expenditure on economic growth. Barro (1991) in a study of 98 developed and developing economies finds a positive but insignificant relation between government expenditure and economic growth over the 1960-1985 period. Devarajan (1996) find a negative relation between the capital component of public investment and economic growth for a group of developing economies.

Kwabena, Oliver and Workie (2005) investigates the effects of higher education human capital on the growth rate of per capita income in African countries during the 1960–2000. They identified that all levels of education human capital, including higher education human capital, have positive and statistically significant effect on the growth rate of per capita income in African counties. Ramayandi (2003) has reviewed the relationship between government size and economic growth in the context of Indonesia and identified that government size tends to have a negative impact on growth.

Shanaka, (2009), examined the relationship between government expenditure and economic growth in Sri Lanka for the period 1959 to 2003. The study found government expenditure has a positive effect on economic growth; further this study suggests that openness is beneficial for Sri Lanka as it increases economic growth. Dilrukshini (2004) studied the relationship between government expenditure and economic growth in Sri Lanka during 1952-2002. The author used time series data to tests the validity of Wagner's Law, and confirmed that there is no empirical support either for the Wagner's Law or for the Keynesian hypothesis, in the case of Sri Lanka.
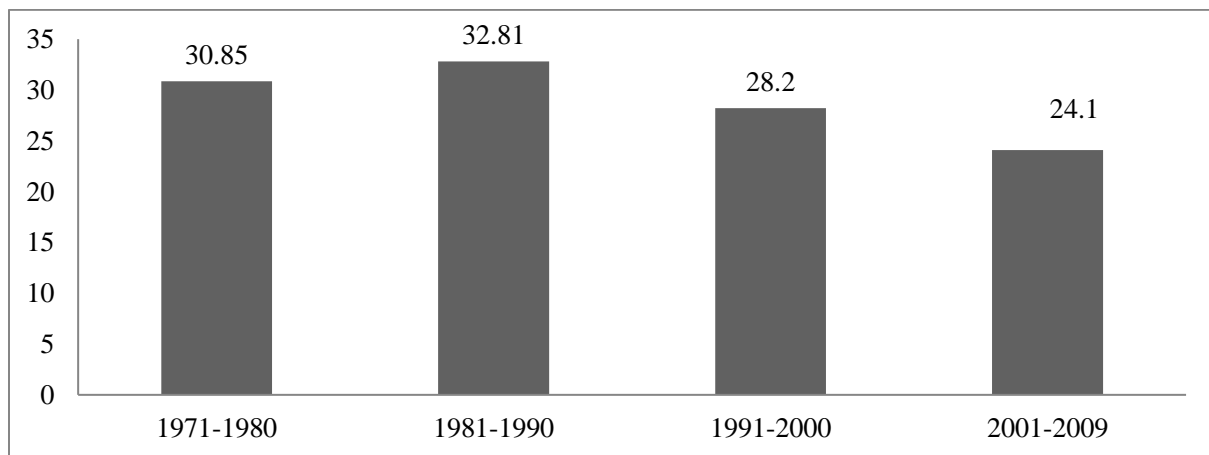
Economic growth and government expenditure in Sri Lanka

Since post economic liberalization, Sri Lanka has come almost full circle with respect to economic policy regimes. Despite a number of external and domestic shocks, including global economic crisis, oil crisis, internal civil war and natural disaster, Sri Lanka has recorded an average about 5 percent economic growth during the past three decades. The graph below shows the historical trend of economic growth in Sri Lanka.
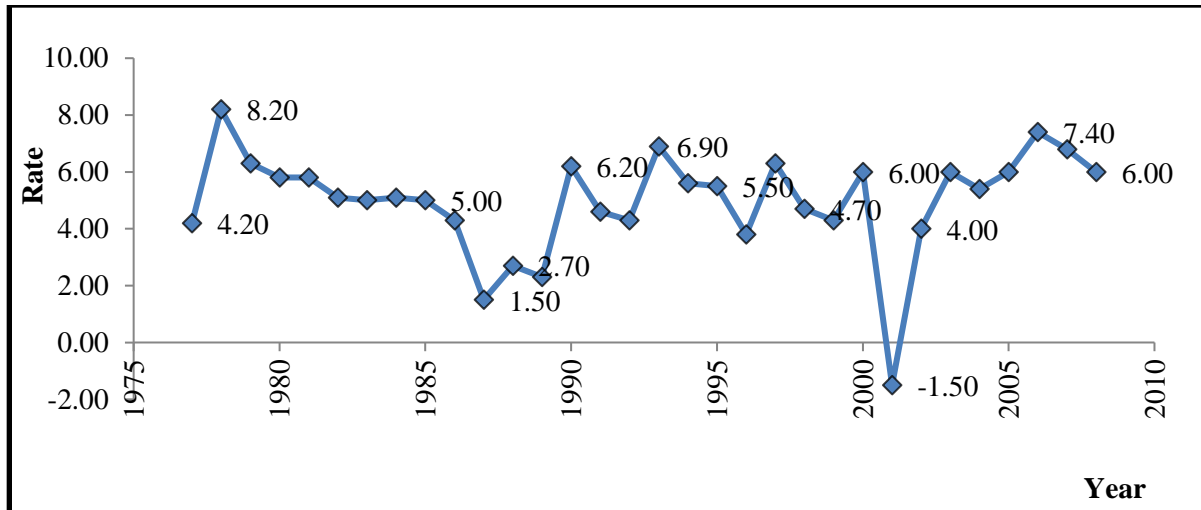
Figure 1: Trend of Economic Growth in Sri Lanka, 1977-2009
Source: Central Bank Annual Report, various years

In the backdrop of considerable economic growth record, it is useful to look at the trend of government expenditure in Sri Lanka. The government expenditures as a percentage of GDP had experienced a decreasing trend after economic liberalization. During 1981-1990 periods, the average government expenditure as percentage of GDP was, 32.81 percent; whereas the comparable figure for the next period, 1991-2000 was 28.2 per cent. Further, this figure decreased to 24.1 percent for the 2001-2009 periods (Figure: 2)

Figure 2: Government expenditure in Sri Lanka, (% GDP) 1977-2009
Source: Central Bank Annual Report, various years

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In a small country like Sri Lanka, the magnitude of the effects of government expenditure on economic growth is primarily depends on the share of expenditure allocated to each sector in total expenditure and crucially depends on the overall policy environment in place. Over the last three decades, despite Sri Lanka has experienced a decreasing trend in government expenditure; the pattern of the composition of expenditure has changed over the period. Figure 3, below shows the average share of the government expenditure on selected components including education, defense, health and transport and communication during the period 1980-2009 and shows the fluctuation over the periods.
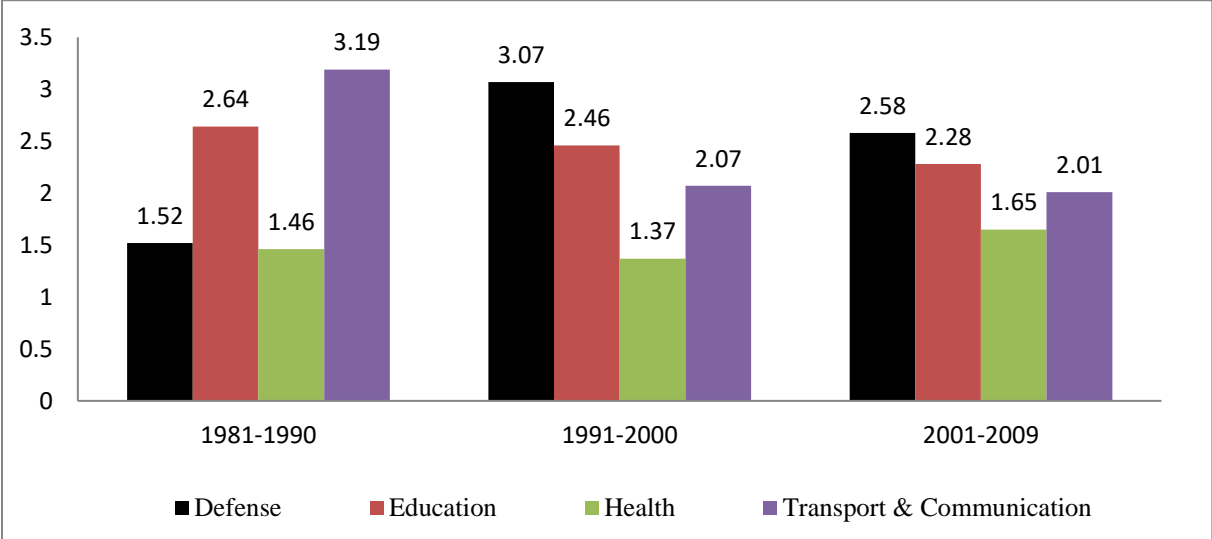
Figure 3: Government expenditure in selected components (% GDP)
Source: Central Bank Annual Report, various years

It is evident that during 1970-2009 periods the defense expenditure dominated all other expenditure categories accounting 2.5 of GDP, which is not surprising given the civil war situation in the country (see Figure 3). Secondly, expenditure in the education sectors shows the highest allocation since government in the country recognize the role of education in development and therefore devoted much public resources to this sector. On the other hand, due to higher private sector participation in health care, expenditure on health sector remained averaged about 1.5 percent of the GDP. Moreover, government expenditure as a percentage of GDP on transport and communication sector declined from 3.9 percent in 1981-1990 to 2.01 percent in 2000-2009.

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Data and Research Methodology

For the purpose of analysis, annual time series data for the period of 1977 to 2009 has been used and all the data has been obtained from the annual reports and monthly bulletins of the Central Bank of Sri Lanka. The annual data covers the period, comprising 33 numbers of observations. All data figures are expressed in Millions rupees, unless otherwise stated. The summary statistics of the variables are reported in table 01, where the total number of observations used in the empirical analysis, means, standard deviation, minimum and maximum values of variables during the time period are given.

Table: 01, Descriptive Statistics of the Economic Variables

Variable	Minimum	Maximum	Mean	Std. Deviation
GDP	36407.00	10179869.00	1328673.66	2043741.83
DEF	223.90	144284.00	32234.54	38110.46
EDU	976.60	100507.00	25192.64	29190.91
HEL	498.10	74548.00	17121.79	21855.61
TRC	444.80	170172.00	23955.32	35219.39

Further, in this study, the government expenditure includes, expenditures on defense, education, health and transport and communication. To test the effects of Government expenditure on economic growth, the model used can be specified as follows:

$$EG_t = \beta_1 + \beta_2 DEF_t + \beta_3 EDU_t + \beta_4 HEL_t + \beta_5 TRC_t + U_t$$

Where dependent variable is economic growth (EG_t) and the independent variables are is the defense expenditure (DEF_t), education expenditure (EDU_t) health expenditure (HEL_t) and transport and communication expenditure (TRC_t). U_t is the Error Term. For the purpose of estimation, the above equation could be rewritten as follows by taking the log on both sides.

$$\ln EG_t = \beta_1 + \beta_2 \ln DEF_t + \beta_3 \ln EDU_t + \beta_4 \ln HEL_t + \beta_5 \ln TRC_t + U_t$$

Where variable on the left side is dependent variable and variables on the right side are the exogenous variables. Further, the tests of stationarity in the Time Series of all the variables in the above equation are tested by applying the popular Augmented Dickey-Fuller (ADF) test.

The Augmented Dicky Fuller (ADF) test is conducted using the following regression.

$$\Delta X_t = a + b_t + pX_{t-1} + \sum_{i=1}^{k} \Delta X_{t-1} + U_t$$

Where, X_t is the individual time series,

ΔX_t, is the first difference of the series X_t

Here, $\Delta X_t = X_t - X_{t-1}$

k is the lag order, t is the linear time trend.

U_t is serially uncorrelated random term and a - is constant.

Moreover, to test the existence of co-integrating relationship among variables in the model, this study has applied the Johansen multivariate co-integration and error correction methodology.

Empirical Evidence

Test for Stationarity (Unit root test)

To have a meaningful understanding of the relationship between two or more economic variables using regression technique, the time series data should satisfy some stationarity properties. Therefore, standard econometric tests like stationarity test and co-integration test were conducted in order to avoid the generation of spurious regression results in the study. Augmented Dickey Fuller test have used to determine the level of integration of the variables in the model. The result of unit root test is presented in Table 2.

The estimated results show that the null hypothesis of have unit roots cannot be rejected for all the variables. Further, the results of the unit root test indicate that, only the RGDP variable is stationary in levels forms. However, all the variables were identified as stationary in the first difference, which means that they are integrated of order one forms. After observing the difference in unit root test results of ADF statistics, these variables were included in the co-integration analysis.

Table 2: Results of the Unit root test

Variables	Level	First Difference	I (d)
lnRGDP	-4.40 (0.02)	--	I (0)
lnEDU	2.14 (0.06)	-5.32 (0.00)	I (1)
lnDEF	1.06 (0.13)	-3.89 (0.03)	I (1)
lnHEL	2.07 (0.09)	-3.36 (0.04)	I (1)
lnTRC	1.58 (0.11)	-4.28 (0.02)	I (1)

Johansen Test for Co integration

The results for the Johansen Maximum likelihood test reported in Table 2, 3 and 4 confirm the rejection of the null hypothesis of no co integration among the variables. In particular, the computed Trace, the maximum Eigen value statistic and their corresponding critical values indicate that the null hypothesis of no co integration (r =0) can be rejected under 5 percent level of significance. Both maximum Eigen value and Trace test indicate one co integrating equation at 5 percent level of significance. This implies that there is a long run relationship among the variables.

Table 3: Trace Test

No of cointegration equations	Trace Statistics	Critical Value (5%)
None[**]	114.41	69.82
At most 1	47.85	65.06
At most 2	29.79	36.38
At most 3	15.49	17.21
At most 4	0.94	3.84

Note: Trace test indicates one co integration equation at the 0.05 level.
   **denotes rejection of the hypothesis at the 0.05 level.

Table 4: Maximum Eigen value Test

No of co integration equations	Maximum Eigen Statistic	0.05 Critical Value
None[**]	49.35	33.87
At most 1	27.58	28.68
At most 2	19.18	21.13
At most 3	14.26	16.28
At most 4	0.94	3.84

Note: Maximum Eigen value test indicates one co integrating equation at the 0.05 level.
**denotes rejection of the hypothesis at the 0.05 level.

Estimation of Long Run Regression Results

The results of long run regression that measure the impact of government expenditure on economic growth in Sri Lanka for the period 1977 to 2009 presented in the Table 5. In government expenditure, four sectors have been considered in the analysis, particularly, expenditure on education, defense, health and transport and communication. The estimated results show that there exists a long run relationship among the variables. Significance of the regressions parameters is tested by the usual t statistic. As evidenced from the estimation shows, education and defense expenditure variable found to be highly significant at the 5 percent critical level, with coefficients showing a 0.61, -0.24 effects on economic growth respectively. The result also reflects the increase of government expenditure on education in Sri Lanka, which is heavily contributing in the long run economic growth. It implies that when the education expenditure in the economy increases by 1 percent, the economic growth rate will also increase by 0.61 percent. On the other hand, a one-percent increase in the defense expenditure leads to a decline in economic growth rate by 0.24 percent. In the case of health expenditure, one percent increase in health expenditure leads to a decline in economic growth rate by 0.3 percent. Further, regression results show, the transport and communication expenditure also significant at the 10 percent critical level, suggesting that an increase in the transport and communication expenditure by 10 percent would increase annual economic growth by 0.16 percent. The explanatory power of the regression is 0.91, which indicates that independent variables are explaining about 91 percentages of the variations in the dependent variable of economic growth.

Table 5: Estimation of Long Run Regression Results

Variable	Coefficient	Std. Error	t - Statistic	Prob
lnDEF	-0.24**	0.08	-2.91	0.00
lnEDU	0.61**	0.28	2.13	0.04
lnHEL	-0.19***	0.25	-1.79	0.03
lnTRC	0.03***	0.02	1.94	0.06
Constant	-709.13	825.43	-0.86	0.39
R^2	0.91			
$\bar{R}^2$	0.89			
DW Statistics	1.04			
F-Statistic	68.53			

Note: *, **, * ** Represents significance at 1%, 5% and 10% critical value respectively.

Error Correction Model

The error correction model approach is useful for the formulation of a short-term adjustment model, which adjustment towards the long run equilibrium in each time period. Table 6 shows the ADF unit root tests for residuals. The results suggests that the residuals are integrated of order zero I (0). Therefore, it can be concluded that the dependent and independent variables are co integrated and thus a valid and stable long run relationships exist among the variables considered.

Table 6: Unit root test for the Residual

Variable	ADF statistic	Critical Values (Level)			Decision (order of Integration)
		1%	5%	10%	
Error term	-5. 20*	-3.69	-2.97	-2.62	I(0)

**Note: * ** Represents significance at 1% critical value.

Moreover, To determine the short run dynamics of the regression model, the following error correction model (ECM) is established.

$$\ln EG_t = \beta_1 + \beta_2 \ln DEF_{t-1} + \beta_3 \ln EDU_{t-1} + \beta_4 \ln HEL_{t-1} + \beta_5 \ln TRC_{t-1} + ECT_{t-1}$$

Table 7: Error Correction Model (ECM)

Variable	Coefficient	Std. Error	t- Statistic
$\Delta LlnDEF$	-0.18***	0.09	-1.77
$\Delta lnEDU$	0.34	0.34	1.01
$\Delta lnHEL$	0.01	0.23	0.06
$\Delta lnTRC$	0.01	0.02	0.74
$EC(-1)$	-0.42**	0.21	-2.01
Constant	337.42	795.21	0.42
R^2	0.23		
$\bar{R}^2$	0.04		
DW Statistics	2.19		
F-Statistic	1.24		

Note: *, **, * Represents significance at 1%, 5% and 10% critical value respectively.**

The estimated coefficient of the error correction model is presented in Table 7. The results show that the estimated error correction term is significant at 5 percent level. It also shows that 42 percent of the deviation of the real GDP from its long run equilibrium level is corrected each year. Further, the error correction coefficient carries negative sign, which is significant, indicating that in Sri Lanka expenditure on education, defense, health, and transport and communication are co-integrated. Moreover, the results show that the coefficient of the education, health and transport and communication are positive but statistically insignificant. Only the defense expenditure is statistically significant at 10 percent level. A one-percent increase in education expenditure in the previous one year leads to 0.34 percent increase in economic growth, on the other hand, a one percent increase on government expenditure on defense in the previous one-year results to a decrease in economic growth by approximately 0.18 percent. The increase in government expenditure on transport and communication expenditure in the previous one year enhance the economic growth by 0.01 percent thus creates an enabling environment for business to strive through reduced cost of production in this

manner promoting economic growth. Further, the short run model also shows that R-square is quite low (0.23), which indicates that the model is not strong enough to explain the variation of economic growth in short run.

Conclusion and Recommendation

This study examines the impacts of government expenditure on economic growth in Sri Lanka over the period 1977 to 2009. In this connection an econometric model is estimated by considering the four main components of the government expenditure including education, defense, health and transport and communication. According to the analysis, there is significant evidence on impact of individual government expenditure on economic growth. The results show, while the government expenditure on education has a positive significant impact on growth, the health expenditure has a negative and significant impact on economic growth. This results suggest that expenditure on health does not a necessarily leads to increase the economic growth, but can leads to reduce the long run economic growth. In case of defense expenditure, the results shows that both in long run and short run defense expenditure has a negative and significant impact on economic growth. The study also indicates that transport and communication expenditure has a positive impact on economic growth. Further, in order to improve the productivity and enhance the economic growth the government should increase its expenditure on education and transport and communication and also should create supportive legal, institutional, infrastructure and stable macroeconomic environment that would facilitate the economic growth. Therefore, the policy implication from this study is that; government needs to place more emphasis on the education and transport and communication sector and divert the defense expenditure to the productive sectors.

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