

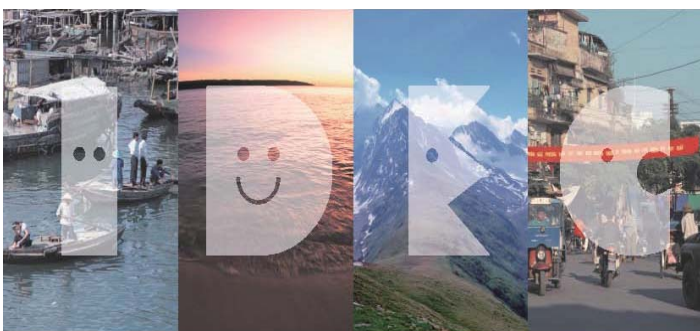
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The Composition of Government Expenditure and Economic
Growth: The Case of Sri Lanka

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**The Composition of Government Expenditure and Economic Growth:
The Case of Sri Lanka**

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ABSTRACT

Government expenditure is one of the key fiscal policy variables that can influence economic growth in any country. Empirical studies examining the impact of government expenditure on economic growth have been heavily debated in recent years, in both developed and developing countries, and most investigations provided mixed results. This study recommends policy implications based on results derived from the following objectives: (1) to investigate the impact of government size on economic growth and determine which government budget will provide the biggest impact on economic growth; (2) to investigate the impact of each component of government investment and government consumption on economic growth. This study employed the Ordinary Least Squares (OLS) regression technique. Data from the Central Bank of Sri Lanka and World Bank from 1960 to 2013 were employed for the aggregated and disaggregated analysis.

This study confirms that government size is positively associated with economic growth in Sri Lanka, while government investment provides the biggest impact on growth. Government consumption in Agriculture, Health, and Welfare, and government investment in Education, Agriculture, and Transportation and Communication, have a positive and statistically significant impact on economic growth. However, government consumption in Education and Defense has a negative, but significant, impact on economic growth. Moreover, this study found that private investment and exports promote economic growth of Sri Lanka.

Keywords: Government expenditure, GDP, economic growth, Sri Lanka

GEL Codes: E62, I22, O11, O38

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1.0 Introduction

The relationship between government expenditure and economic growth has emerged as an interesting research issues in both developed and developing countries. For a long time, many arguments arose about the relationship between government expenditure and economic growth. According to Keynesian theory, government expenditure is an exogenous policy instrument that causes changes in the aggregate level of real output in the short run, and expansion of government expenditure accelerates economic growth.

Empirical studies examining the impact of government expenditure on economic growth have been heavily debated in recent years, in both developed and developing countries, and most investigations provided mixed results. Some developing countries with big governments have high economic growth, while others do not. Sri Lanka is one such nation, with the highest economic growth in the south Asian region over the last five decades. The government size (Total Government expenditure as a percentage of GDP) of Sri Lanka averaged 29% of GDP from 1960 to 2013. Sri Lanka spent at least 21% of its GDP annually on government expenditure. In extreme cases, government spending was as high as almost 38%.

In the past six decades, the Sri Lankan economy has been ruled by different political groups and affected by different kinds of internal conflicts, economic shocks, and natural disasters. Accordingly, government policies were implemented by preparing the national budget of Sri Lanka mainly aiming the intention of politicians. According to Dilrukshini (2004), public expenditure in Sri Lanka is not directly dependent on or determined by economic growth. Also, the growth of government expenditure was not designed to create economic growth, and it was influenced by political pressure, intervention by other outside groups (such as trade unions), civil struggles and so on. Perhaps to secure votes, policy makers, allocated government expenditure for different sectors of the economy by government consumption and government investment expenditure.

Furthermore, Sri Lanka has experienced frequent strikes from different field of public servants demanding higher portion of budgetary allocations for their individual sectors. For instance, state universities are often closed due to academics strikers, demanding that Education spending be taken from 1.86% to 6% of GDP. Doctors and others in the healthcare sector strike, demanding a similar increase for healthcare sector. Indeed, even the general public strikes, demanding a reduction in the price of consumption goods. Accordingly, we can extrapolate a mismatch in composition of government expenditures in Sri Lanka.

Although many macroeconomic studies have empirically tested this by stimulating each component of GDP, there is considerable room for continued research on the composition of government expenditure and economic growth. But, it is often controversial and incites debate on the most appropriate ways of allocating limited public funds for each sector to increase economic growth.

As briefly discussed above, the relationship between government expenditure and economic growth in Sri Lanka seems to be arguable in terms of economic development. Accordingly, this study is organized into six sections, including the Introduction. Section Two presents an overview of the Sri Lankan economy, including current economic performance and government expenditure, as well as the government expenditure patterns of some selected South

Asian countries. Section Three reviews the theoretical background and some previous literature related to the impact of government expenditure on economic growth. The data and methodology used in this study are clearly explained in Section Four. After getting the empirical results, the interpretation, discussion, and comparison with previous findings are presented in Section Five, as well as some policy recommendations. Finally, Section Six concludes the overall discussion of research findings and produces a direction for future research.

2.0 An Overview of the Sri Lankan Economy

Sri Lanka is a lower-middle-income developing country in the south Asian region. It has recorded 5% average real GDP growth rate in the last fifty years. Sri Lanka has the strongest growth rates at present with GDP \$67.2 billion and per capita GDP of about \$3,280, which is higher than other countries in the South Asian region. The main economic sectors of the country are tourism, tea exports, apparel, textiles, rice production, and other agricultural products. In addition to these economic sectors, remittance employment contributes highly in foreign exchange; 90% of expatriate Sri Lankans reside in the Middle East.

After becoming independent from Britain in February 1948, the economy of Sri Lanka has been affected by natural disasters, like the Indian Ocean earthquake (tsunami) in 2004 and internal conflicts from 1971-1972, 1987-89, and the civil war from 1983-2009. The parties, which governed the country after 1948, did not implement any unique national plan or policy on the economy by changing between pro-left and pro-right economic practices.

2.1 Government Expenditure and GDP growth

Figure 2.1 shows the trend of government expenditure as a percentage of real GDP, real GDP in rupees million, and economic growth in Sri Lanka from 1960 to 2013. It shows the total government expenditure as the percentage of GDP (Government size) was 29%, on average, from 1960 to 2013. Sri Lanka spent at least 21% annually from the GDP in this period, as high as almost 38% at the extreme end.

Figure 2.1: Growth Rate of Real GDP, Real GDP, and Total Government Expenditure as a Percentage of GDP (both in real terms) from 1960 – 2013

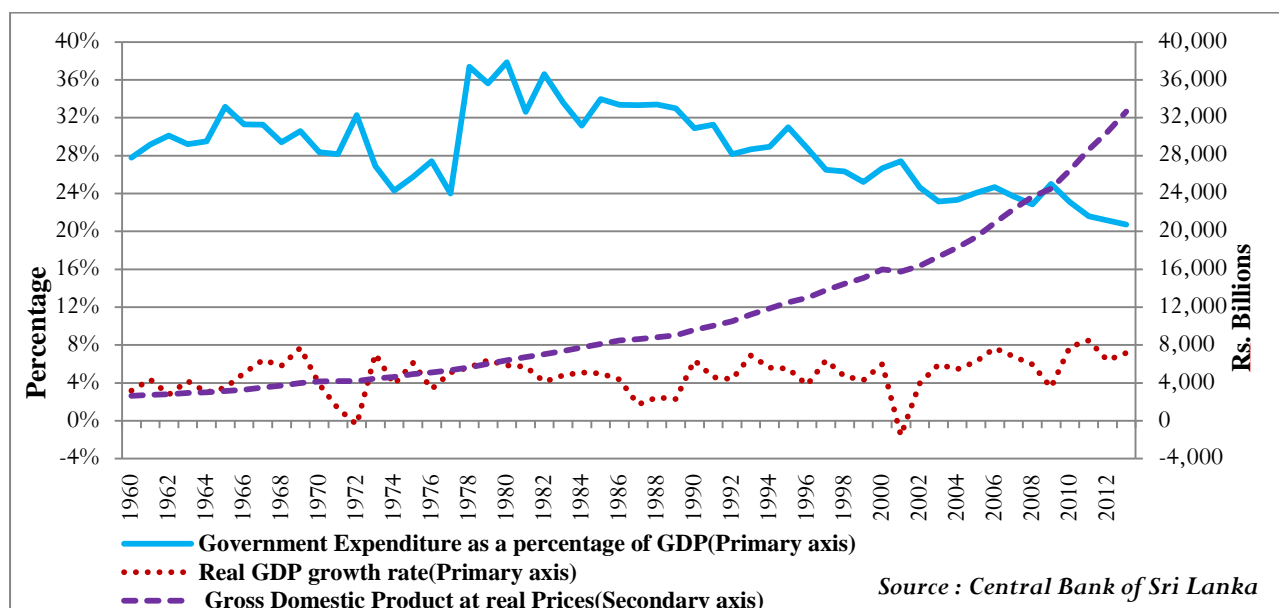


Figure 2.1 shows stagnation in government expenditure from 1960 to 1977. The rapid increase in government expenditure can be seen subsequent to introducing the open economic policy. Sri Lanka was the first country in the south Asian region to liberalize their trade and investment policies in 1977, so, many inflows of capital resources were generated through favorable aid terms and investment conditions. Therefore, government investment was rapidly increased during the early stages of economic liberalization.

Government expenditure as a percentage of GDP shows a downward trend after introducing the open economy in 1978. However, total public expenditure, in nominal terms, has shown an upward trend, reflecting the expansion of the overall public sector. Herath (2010) mentioned that government policies and spending decisions changed frequently, since the left- and right-aligned political parties won general elections one after the other, and came into power interchangeably. Accordingly, government expenditure policies were changed. However, real GDP still rapidly increased over the period of study.

Table 2.1 shows government expenditure as a percentage of GDP, and GDP growth rates in selected south Asian countries from 1990 to 2012. The total government expenditure of India was 17.3% of GDP in the 1990s, reduced to 14.3% of GDP in 2012. Average government expenditure was 15.4%, and average GDP growth rate was 6.5% over the last 23 years.

Table 2.1: Government Expenditure (% GDP) and GDP Growth Rates in South Asian Countries

Years	Sri Lanka		India		Nepal		Bangladesh	
	Government expenditure (% GDP)	GDP growth rate	Government expenditure (% GDP)	GDP growth rate	Government expenditure (% GDP)	GDP growth rate	Government expenditure (% GDP)	GDP growth rate
1990	28.7	6.24	17.3	5.29	17.7	4.72	12.4	5.94
1995	29.6	5.53	14.1	7.29	16.6	3.36	14.4	4.92
2000	25.0	5.98	15.5	4.40	16.3	5.99	14.5	5.95
2002	23.8	4.00	16.8	3.80	17.4	1.00	14.9	4.40
2004	22.6	5.40	15.8	7.50	14.7	4.70	14.8	6.30
2006	24.2	7.67	13.6	9.57	15.5	3.36	14.7	6.63
2008	22.1	5.95	15.7	6.72	18.4	6.10	17.1	6.19
2010	22.1	8.02	15.4	9.32	21.0	4.82	15.2	6.07
2012	19.4	6.41	14.3	4.99	20.8	4.85	16.0	6.23
Average	24.2	6.13	15.4	6.54	17.6	4.32	14.9	5.85

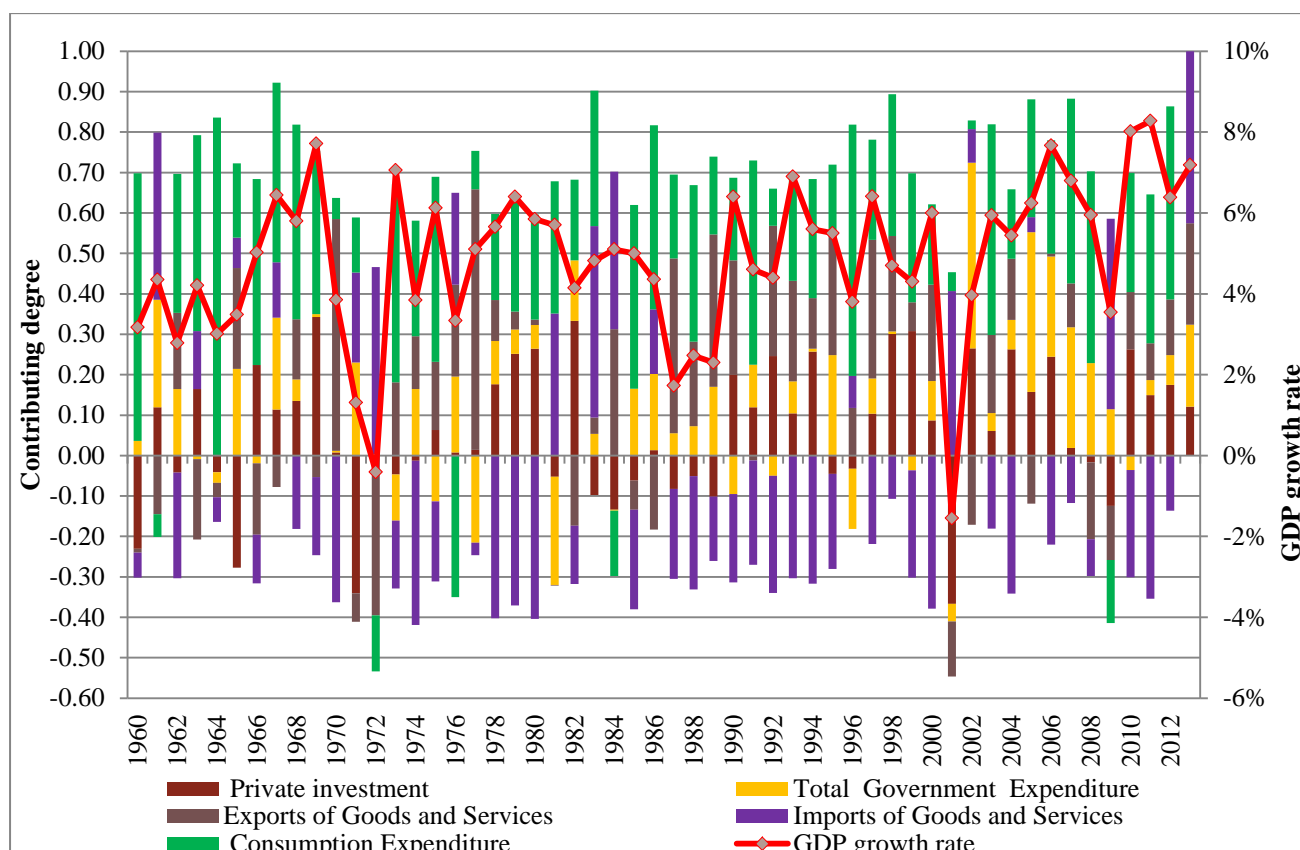
(Source- Key indicators of Asia and Pacific 2013, ADB)

In Nepal, total government expenditure was only 17.7% of GDP in the 1990s, gradually increasing to 20.8% of GDP in 2012, with average expenditure and GDP growth of 17.6% and 4.3% respectively. In Bangladesh, government expenditure during the 1990s was 12.4%, but this has slightly increased to 16% of GDP in 2012. However, government expenditure in Sri Lanka during the 1990s was 28.7% of GDP; it has drastically reduced to 19.4% in 2012. It has demonstrated an average government expenditure of 24.2% and average growth rate of 6.1% over the last 23 years. This confirms that government expenditure in Sri Lanka results in the highest GDP growth rate among south Asian countries.

2.2 Contributing Degrees to Economic growth

Figure 2.2 shows the contribution of each expenditure component of the GDP and GDP growth rate in Sri Lanka between 1960 and 2013. We can see the private consumption expenditure shows a very positive contribution to economic growth. But, in some years such as, 1961, 1971, 1977, 1984 and 2004, it contributed negatively to economic growth with a reduction in private consumption expenditure.

Figure 2.2: Contributing Degrees to Real GDP Growth Rate in Expenditure Approach from 1960 to 2013.



(Source- Author's calculations based on data from Central Bank of Sri Lanka)

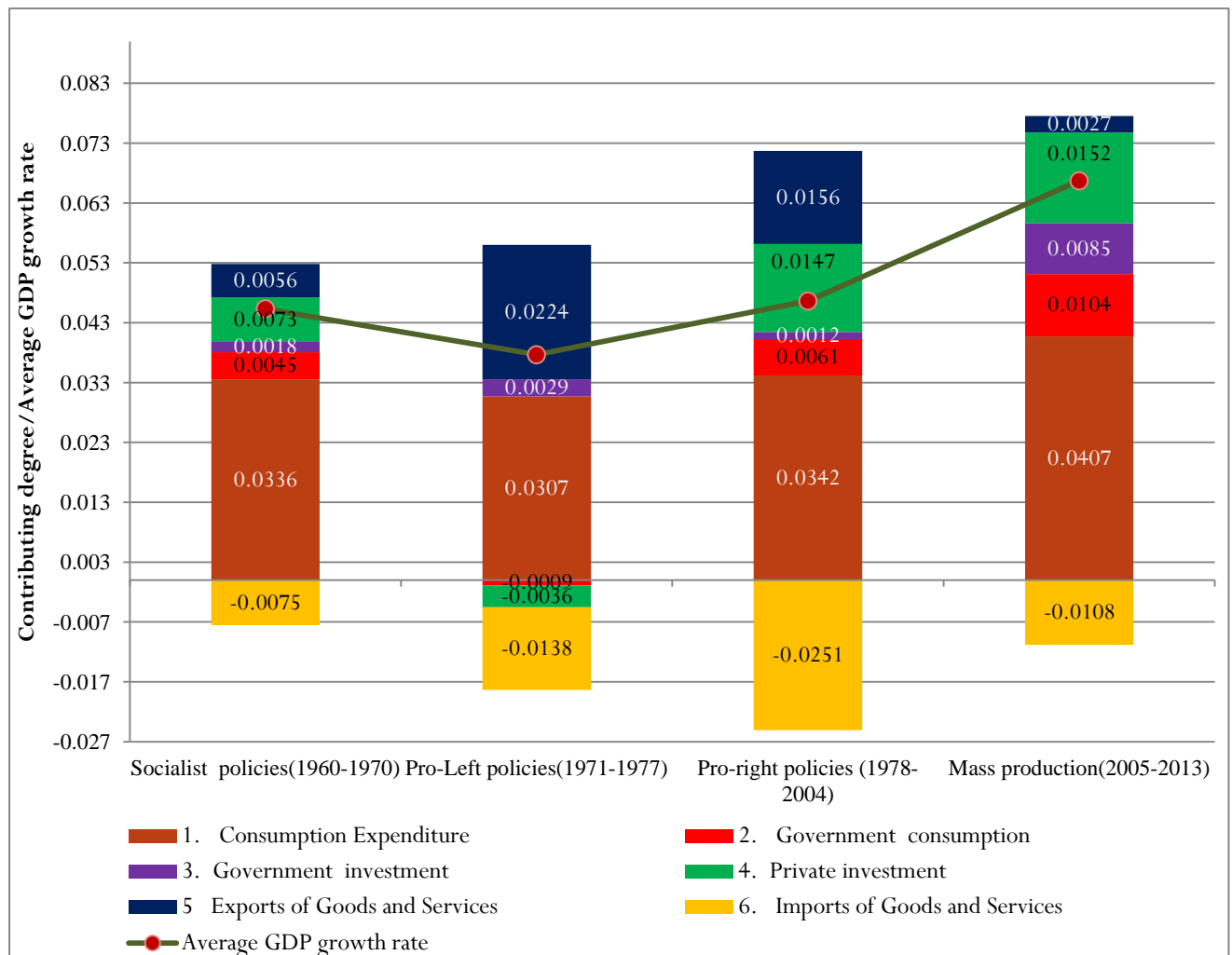
Exports and imports have contributed positively to economic growth in some years, but not others. Overall, we can conclude that an import has contributed negatively to GDP growth. Private investment and total government expenditure have most often contributed positively to GDP growth. Total government expenditure, private investment, and exports have all contributed negatively during periods of recession in the Sri Lankan economy, including 2001.

According to Figure 2.3, the Sri Lankan economy has been divided into four periods based on government expenditure policy in each administration. That is; Socialist policies (1961-1970), Pro-left policies (1971-1977), Pro-right policies (1978-2004), and Mass production (2005-2013). Moreover, Herath (2010) mentioned that government policies and spending decisions were changed frequently, since the left- and right-aligned political parties won general elections one after the other, and came into power interchangeably. This resulted in four distinct economic periods in Sri Lankan history.

The present government of Sri Lanka has implemented production-based economic policy to achieve sustainable economic development in the near future. It is concentrated on mass production of goods for domestic consumption, such as rice, grain, and other agricultural products. This framework is based on the policy statement, “Mahinda Chintana: Towards a new Sri Lanka.” This is envisioned as a resolution to prolonged conflict, implementing large infrastructure development initiatives in electricity generation, ports, airports, Water supply and irrigation, roads and Transportation, Agriculture, and domestic enterprises. These policies are intended to strengthen public services and state-owned enterprises, promote the private sector and SME’s and implement integrated rural development initiatives aiming to empower villages (Project called “Gama Neguma”).

Government consumption expenditure shows a negative contribution to GDP growth under the pro-left policies from 1971 to 1977, but government investment contributed positively. In another economic time period, government investment and government consumption expenditures have positively contributed to GDP growth, for instance, during the mass production years from 2005 to 2013. The average GDP growth rate is also highest in this period. This period is the most efficient example of economic growth in Sri Lanka.

Figure 2.3: Contributing Degrees to Real GDP Growth from 1960 – 2013 (by government expenditure policy period)



(Source- Author’s calculations based on data from the Central Bank of Sri Lanka)

3.0 Review of Empirical Studies

The impact of government expenditures on economic growth is a topic of great interest among researchers. Many have empirically tested this topic with individual and cross-national analysis. The findings are mixed, some positive, some negative, and some inconclusive. Next, we will review the previous studies into total government expenditure, government consumption, government investment, and the impact of these components on economic growth.

3.1 Empirical Studies of Aggregated Government Expenditure and Economic Growth-Positive Relationships

Some literature shows a positive relationship between government expenditure and economic growth. According to Keynesian macroeconomic theory, government expenditure can contribute positively to economic growth. Therefore, an increase in government consumption or government investment is seen to result in an increase in employment, investment, and profitability through the multiplier effect on aggregate demand. Accordingly, it causes an increase in output depending on expenditure multipliers.

Ram (1986) showed a positive relationship between government size and economic growth, especially in developing countries, by using the data of 115 developed and less-developed countries from 1960 to 1980. He created a two-sector production function framework for the data of each individual country. He further confirmed that the effect of government expenditure differs from relative factor productivity to positive externality effect.

Dar and Amirkhakali (2002) concluded that government consumption expenditure has a positive and statistically significant impact on economic growth in OECD countries between 1971 and 1999. In addition, Loizides and Vamvoukas, in 2005, found a positive relationship by utilizing annual data from the United Kingdom, Greece, and Ireland. They concluded that public expenditure can foster overall economic performance in both short-run and long run. They further confirmed growth in output can increase public expenditure in Greece and the UK, but Ireland did not support this conclusion.

Wu, Tang and Lin (2010) suggested the impact of government expenditure was dependent on institutional capacity and quality. They studied the impact of government expenditure on economic growth by using panel data of 182 countries. According to their findings, government expenditure of developed countries had a positive impact on economic growth, while in the low-income countries; it destroyed economic growth, due to poor international capacity and corruption.

More recently, Irfan, Attari, and Javed (2013) measured the positive relationship between government expenditure and economic growth in Pakistan by using the time series data from 1980 to 2010. In this study, government expenditure has been disaggregated into current expenditure and development expenditure. The coefficient of the current expenditure is positive and statistically insignificant, but the coefficient of development is positive and statistically significant. They concluded that government expenditures yield positive externalities and linkages. Similarly, Knoop (1997), Sinha (1998), Komain and Tantatape(2008), Ranjan and Sharma (2008), and Liu et al (2008) found that government expenditure had a positive impact on economic growth.

Turning to the Sri Lankan situation, Herath (2010) found a positive relationship between government expenditure and the economic growth of Sri Lanka from 1959 to 2003. Further, he suggested that openness is beneficial for Sri Lanka, in terms of economic growth. Furthermore, this positive relationship is confirmed by Shaista, et.al. (2010), who examined the long-run relationship between government expenditure and economic growth in Asian developing countries, including Sri Lanka.

3.2 Empirical studies of Aggregated Government Expenditure and Economic Growth- Negative Relationship

A review of some literature shows government expenditure as detrimental to economic growth. Landau (1983, 1985) has concluded a negative relationship between the two corollaries, suggesting the increase of government expenditure is correlated with a slowdown in growth in developing countries.

Grier and Tullock (1989) confirmed a negative relationship between government consumption expenditure on economic growth by utilizing the data from 113 countries. They used the 24 OECD countries' data ranging from 30 years, and 20 years of all the others, including African, Central and South American, and Asian countries. All the countries supported the negative relationship except the Asian countries.

Devarajan, Swaroop, and Zou (1996) have found the negative relationship between government investment expenditure and economic growth by disaggregating the government expenditure into productive and unproductive expenditure in developing countries. They concluded that productive expenditure becomes unproductive, in excessive amount. The reasons for these results imply that the developing country's government has been misallocating investment expenditures at the expense of consumption expenditures.

In 1997, Guseh examined the relationship between growth in government size and economic growth in the case of 59 middle-income developing countries over the period 1960-1985. He developed a model, which differentiates the effect of government on growth across political and economic institutions. The results confirmed growth in government size has adverse effects on economic growth in developing countries. However, adverse effects are three times greater in non-democratic, socialist countries, as opposed to countries with a democratic market system. Likewise, Engen and Skinner (1992), Romero-Avila and Strauch (2008), and Afonso and Alegre (2008) found that government expenditure was not a significant determinant of economic growth.

3.3 Empirical studies of Aggregated Government Expenditure and Economic Growth- No Relationship

Although previous studies generally found mixed results between government expenditure and economic growth, some researchers did not find any relationship. Lai and Hsieh (1994) studied the Group-of-7 (G-7)² countries, based on Barrow's (1990) endogenous growth model. They conducted a multivariate time series analysis with Vector Auto Regressions (VAR). Results suggested that the relationship between government expenditure and growth

² G-7 is a forum of the world's most industrialized economies, established in 1975. It is comprised of seven nations; Canada, France, Germany, Italy, Japan, the United Kingdom, and the United states. G-7 became G-8 when Russia joined in 1998.

could differ significantly across time, and among major industrialized countries that probably belong to the same overall growth trend. They were unable to find any consistent evidence that government expenditure can increase economic growth. Further, government spending was found to contribute, at best, a small proportion of the growth of an economy.

In 1997, Ghali attempted to estimate the nature of the relationship between government expenditure and economic growth in Saudi Arabia by using Barrow's (1990) endogenous growth model and Vector autoregressive (VAR) analysis. He found no consistent evidence that government-spending increase Saudi Arabia's per capita output growth, so suggests the government has to control the budget deficit by shrinking the size of the government and limiting its role in the economy.

In the case of Malaysia, Sinha (1998) studied the relationship between government expenditure and economic growth by adopting six versions of Wagner's Law. He did not find any evidence that the growth of government expenditure contributes to the growth of GDP, nor was there evidence of reverse causality. The policy implication was to consider different structures of government expenditure to contribute more effectively to economic growth, because the present structure was not helpful to economic growth.

Most recently, Rehman, Iqbal, and Siddiqi (2010) studied the relationship between these two variables in the case of Pakistan, by considering the aggregate level and disaggregate level of government expenditure data from 1971 to 2006. They used the co-integration test and the Granger causality test to confirm the six versions of Wagner's law. They concluded there was no impact of government spending on economic growth. Therefore, the Keynesian hypothesis was clearly rejected in the case of Pakistan.

According to the above empirical studies, the relationship between government expenditure and economic growth has clearly not been decided. It varies case to case, country to country, and time to time. Simple aggregate analysis is not sufficient for decision-making. For the best results, a disaggregate analysis should also be performed, as we will here, in the case of Sri Lanka.

3.4 Empirical studies of Disaggregated Government Expenditure and Economic Growth

As seen in the above empirical studies, the relationship between aggregate government expenditure and economic growth is still debatable. As Barrow (1990) suggested, the impact of public spending on economic growth may vary depending on the structure or composition of the expenditures themselves. Therefore, it is better to classify government expenditure into different functional sectors. This provides a more reasonable explanation of why aggregate analysis shows a positive, negative, or insignificant relationship.

This was further confirmed by World Bank (2007), which urges governments to consider the growth effect of composition of public expenditure. Some previous researchers have studied disaggregate government expenditure on either an individual or cross-country basis. To my knowledge, no complete study has decomposed government expenditure into each sector of the economy. This study creates more motivation to examine these two variables in depth.

Landau (1986) tested government expenditure and economic growth in less developed countries by utilizing data from 1960 to 1980. He found that government investment expenditure has a weak positive impact on economic growth, while education expenditure has a negative

impact on growth. Building on this, Baum and Lin (1993) empirically tested the differential impacts of various types of government expenditure on economic growth. They derived the econometric model from the aggregate production function and used the data from 58 developed and developing countries, concluding that the growth rate of educational expenditure has a significant positive impact on economic growth, while the growth rate of Welfare expenditures has an insignificant negative impact on growth. However, growth rate of Defense expenditure has a positive impact on economic growth. This was contrary to the negative findings of the relationship between education expenditure and economic growth in developing countries by Miller and Russek (1997).

Devarajan, Swaroop, and Zou (1997) found a positive relationship between spending on Transportation and Communication on per capita growth, but education and Health did not have a positive impact, based on data from 43 developing countries, including Sri Lanka, over the period 1970 to 1990.

Karagol and Palaz (2004) found a negative relationship between Defense expenditure and GNP in the case of Turkey from 1960-2002. Similarly, Tang (2008) examined the relationship between Defense expenditure and economic growth in Malaysia between 1960 and 2008, using the bounds testing procedure. He found that Defense expenditure and economic growth is negatively correlated in both the short-run and long run.

Abu and Abudullahi (2010) used annual data for Nigeria from 1970 to 2008, and the Co-integration and Error Correction method, to investigate the relationship between government expenditure and economic growth. According to them, government total expenditure, total recurrent expenditure, and government expenditure on education have a negative effect on economic growth.

However, Ganegodage and Rambaldi (2011) tested the impact of education investment for Sri Lankan economic growth using the data from 1959 to 2008, and found that education expenditure had a positive impact on economic growth, while physical capital could not produce positive externalities. In addition, Shasta, et al. (2010) concluded that expenditures in Education, infrastructure, and Health play a major role in promoting economic growth in selected Asian developing countries, including Sri Lanka.

Most recently, Shahbaz et al. (2013) found a negative relationship between Defense expenditure and economic growth in Pakistan by using time series data from 1972 to 2008. They utilized the aggregate demand-and-supply model to investigate the relationship of these two variables.

So, different types of government expenditure may have a differential impact on economic growth in developed countries, as well as in developing countries. Empirical results in previous studies found positive, negative, and mixed impact of each component of government expenditure on economic growth. Most researchers have analyzed the impact of total government expenditure for each sector of the economy, because of the unavailability of expense details in each sector. However, this study separately analyzes each functional component of government consumption and government investment expenditure on economic growth.

4.0 Methodology Specifications

Most empirical studies of government expenditure on economic growth have been conducted using cross-country data. However, Lee et al (1998) stated that a cross-country, or panel data, analysis does not allow for consistent estimation of country-specific growth effects, and might cause bias in the estimation of the average growth.

Moreover, Colombier (2011) explains that although cross-country and panel data analyses have their advantages, they suffer severely from heterogeneity of the underlying data set, because countries differ from each other in culture, political and economic systems, geographical features, and so on. Hence, it is difficult to capture the country-specific nature of government expenditure on economic growth. The Sri Lankan situation is different from the other countries. It is difficult to compare with others for these same reasons. Accordingly, this study will be more complete, if only for analysis at aggregate and disaggregate levels.

In this study, the model employed is a generalization of the commonly used growth accounting model, based on the aggregate production function. It was developed by Dar and Amirkhalkhali in 2002, using the basic growth accounting of Solow's production function model, in which the rate of economic growth is a function of capital and labor accumulation and total factor productivity, and assumed that total factor productivity depends on the rate of export expansion and the size of the government sector. In addition to these explanatory variables, two dummies are used for Sri Lankan case.

Finally, following Devarajan, Swaroop, and Zou's (1996), five-year forward-moving average of real GDP growth rate is used as the dependent variable to capture the long-term effect. The forward lag is chosen to reflect the fact that government expenditures often take time before their output growth can be registered. The forward lag structure also aims to minimize the possibility of reverse causality, by modelling expenditure in period t as affecting growth from period $t+1$ through $t+5$. Accordingly, the estimation model can be written as;

$$g_{y(t+1, t+5)} = \beta_0 + \beta_1 \left(\frac{PI}{Y}\right)_t + \beta_2 (g_{EX})_t + \beta_3 (g_L)_t + \beta_4 \left(\frac{GS}{Y}\right)_t + \beta_7 D_{shocks_t} + \beta_8 D_{conflict_t} + u_t \quad (4.1)$$

$GS = GI + GC$, Therefore,

$$g_{y(t+1, t+5)} = \beta_0 + \beta_1 \left(\frac{PI}{Y}\right)_t + \beta_2 (g_{EX})_t + \beta_3 (g_L)_t + \beta_5 \left(\frac{GI}{Y}\right)_t + \beta_6 \left(\frac{GC}{Y}\right)_t + \beta_7 D_{shocks_t} + \beta_8 D_{conflict_t} + u_t \quad (4.2)$$

Equation 4.2 can be modified to estimate the impact of components of government consumption and government investment expenditure on economic growth as follows;

$$g_{y(t+1, t+5)} = \beta_0 + \beta_1 \left(\frac{PI}{Y}\right)_t + \beta_2 (g_{EX})_t + \beta_3 (g_L)_t + \beta_5 \left(\frac{GI}{Y}\right)_t + \gamma_1 \left(\frac{GCWEL}{Y}\right)_t + \gamma_2 \left(\frac{GCDEF}{Y}\right)_t + \gamma_3 \left(\frac{GCEDC}{Y}\right)_t + \gamma_4 \left(\frac{GCHLT}{Y}\right)_t + \gamma_5 \left(\frac{GCAGR}{Y}\right)_t + \gamma_6 \left(\frac{GCTPC}{Y}\right)_t + \gamma_7 \left(\frac{GCENW}{Y}\right)_t + \beta_7 D_{shocks_t} + \beta_8 D_{conflict_t} + u_t \quad (4.3)$$

$$g_{y(t+1, t+5)} = \beta_0 + \beta_1 \left(\frac{PI}{Y}\right)_t + \beta_2 (g_{EX})_t + \beta_3 (g_L)_t + \beta_6 \left(\frac{GC}{Y}\right)_t + \gamma_8 \left(\frac{GIEDC}{Y}\right)_t + \gamma_9 \left(\frac{GIHLT}{Y}\right)_t + \gamma_{10} \left(\frac{GIAGR}{Y}\right)_t + \gamma_{11} \left(\frac{GITPC}{Y}\right)_t + \gamma_{12} \left(\frac{GIENW}{Y}\right)_t + \gamma_{13} \left(\frac{GIHOS}{Y}\right)_t + \beta_7 D_{shocks_t} + \beta_8 D_{conflict_t} + u_t \quad (4.4)$$

The above regression equations include only the linear variables. The prime variables of interest are government size, government consumption, and government investment. Others are included as control variables. This study employs the Ordinary Least Squares (OLS) estimation technique to examine the influencing effect of each variable by following the Devarajan, et al (1996), Ram (1986) and Herath (2010). See appendix 01 for the description of variables and data sources.

5.0 Empirical results and Discussion

5.1 Unit root test

Stationarity of time series data shows important evidence. In order to test the unit root, or stationarity of the variables in each econometric model, the Augmented Dickey-Fuller (ADF) test is employed. The results of the ADF and the stationarity level of the data series are shown in Table 5.1.

Table 5.1: Unit Root Test: Augmented Dickey-Fuller test-(ADF test)

Variable	ADF Statistics	Probability	Order of Integration
g_Y	-5.5057***	0.0000	I(0)
PI/Y	-6.3269***	0.0000	I(0)
g_{EX}	-7.3381***	0.0000	I(1)
g_L	-4.5301***	0.0006	I(0)
GC/Y	-8.4235***	0.0000	I(0)
GI/Y	-2.7124*	0.0786	I(0)
GC-EDC	-9.1008***	0.0000	I(0)
GC-HLT	-8.3183***	0.0000	I(0)
GC-AGR	-4.5829***	0.0005	I(0)
GC-WEL	-7.1025***	0.0000	I(1)
GC-DEF	-7.8363***	0.0000	I(0)
GC-TPC	-2.8435*	0.0591	I(0)
GC-ENW	-3.4559**	0.0132	I(1)
GI-TPC	-3.7128***	0.0066	I(0)
GI-AGR	-2.7564*	0.0716	I(0)
GI-EDC	-3.6930***	0.0069	I(0)
GI-HLT	-5.0673***	0.0001	I(0)
GI-HOS	-4.8811***	0.0002	I(0)
GI-ENW	-6.6466***	0.0000	I(1)

Notes: *, ** and *** denote rejection of the null hypothesis of unit roots for the ADF test at 10%, 5% and 1% significant level.

(Source: Author's calculations using E-views 8 software)

These results suggest that on level data series of many variables are stationary excepting the growth of exports, government consumption expenditure on Welfare, and Energy and water, and government investment expenditure on Energy and water. However, these variables are stationary at first difference. Therefore, the stationary data series of variables is employed in a time series regression using the Ordinary Least Squares (OLS) technique. Accordingly, equation 4.1, 4.2, 4.3, and 4.4 can be modified for the estimation purposes as follows. Δ denotes the first difference of each variable.

$$g_{y(t+1, t+5)} = \beta_0 + \beta_1 \left(\frac{PI}{Y}\right)_t + \beta_2 \Delta(g_{EX})_t + \beta_3 (g_L)_t + \beta_4 \left(\frac{GS}{Y}\right)_t + \beta_7 D_{shocks_t} + \beta_8 D_{conflict_t} + u_t \quad (\text{Model 1})$$

$$g_{y(t+1, t+5)} = \beta_0 + \beta_1 \left(\frac{PI}{Y}\right)_t + \beta_2 \Delta(g_{EX})_t + \beta_3 (g_L)_t + \beta_5 \left(\frac{GI}{Y}\right)_t + \beta_6 \left(\frac{GC}{Y}\right)_t + \beta_7 D_{shocks_t} + \beta_8 D_{conflict_t} + u_t \quad (\text{Model 2})$$

$$g_{y(t+1, t+5)} = \beta_0 + \beta_1 \left(\frac{PI}{Y}\right)_t + \beta_2 \Delta(g_{EX})_t + \beta_3 (g_L)_t + \beta_5 \left(\frac{GI}{Y}\right)_t + \gamma_1 \Delta\left(\frac{GCWEL}{Y}\right)_t + \gamma_2 \left(\frac{GCDEF}{Y}\right)_t + \gamma_3 \left(\frac{GCEDC}{Y}\right)_t + \gamma_4 \left(\frac{GCHLT}{Y}\right)_t + \gamma_5 \left(\frac{GCAGR}{Y}\right)_t + \gamma_6 \left(\frac{GCTPC}{Y}\right)_t + \gamma_7 \Delta\left(\frac{GCENW}{Y}\right)_t + \beta_7 D_{shocks_t} + \beta_8 D_{conflict_t} + u_t \quad (\text{Model 3})$$

$$g_{y(t+1, t+5)} = \beta_0 + \beta_1 \left(\frac{PI}{Y}\right)_t + \beta_2 \Delta(g_{EX})_t + \beta_3 (g_L)_t + \beta_6 \left(\frac{GC}{Y}\right)_t + \gamma_8 \left(\frac{GIEDC}{Y}\right)_t + \gamma_9 \left(\frac{GIHLT}{Y}\right)_t + \gamma_{10} \left(\frac{GIAGR}{Y}\right)_t + \gamma_{11} \left(\frac{GITPC}{Y}\right)_t + \gamma_{12} \Delta\left(\frac{GIENW}{Y}\right)_t + \gamma_{13} \left(\frac{GIHOS}{Y}\right)_t + \beta_7 D_{shocks_t} + \beta_8 D_{conflict_t} + u_t \quad (\text{Model 4})$$

5.2 Aggregated Analysis

In order to examine the influence of government size, a series of regression analyses were carried out using the Ordinary Least Squares (OLS) estimation technique. Table 5.2 shows the regression results.

All the explanatory variables used are shown in the Result 1 columns. Since the coefficient of labor force growth was not statistically significant, it was eliminated in regression Result 2. After that, all included variables became significant in the reduced model in Result 2. According to the theoretical view, we expect a positive coefficient for all included variables, except the dummy variables, which should be negative coefficients. This means the dummy for internal conflict and dummy for economic shocks should decrease the economic growth of Sri Lanka.

Government size has a positive and significant impact on economic growth with the coefficient 0.219 at a 1% significant level. The estimated result indicates that government size is beneficial for economic growth in Sri Lanka. Additionally, the coefficient of private investment share of GDP is positive and statistically significant at 10%, while the growth rate of exports has the expected positive coefficient, but only weakly significant at 10% level. Both private investment and exports are beneficial for the Sri Lankan economy. Moreover, both the dummy

for internal conflict and dummy for economic shocks have the expected negative coefficients and they are significant at 1% and 5% respectively.

Table 5.2: Regression Results on the Impact of Government Size on Economic Growth in Sri Lanka from 1960 to 2013. (Model 1)

Dependable variable : Five-year forward-moving average of real GDP growth rate					
Variable		Result 1		Result 2	
		Coefficient	SE	Coefficient	SE
Constant	β_0	0.0103	0.0118	0.0138	0.0110
Private investment (% of GDP)	β_1	0.0501*	0.0288	0.0457*	0.0272
Δ Growth of exports	β_2	0.0033*	0.0018	0.0036**	0.0018
Growth of labor force	β_3	0.0120	0.0146		
Government size	β_4	0.219***	0.0472	0.2088***	0.0453
D _{SHOCKS}	β_7	-0.0097**	0.0045	-0.0102**	0.0044
D _{conflict}	β_8	-0.0087*	0.0051	-0.0087*	0.0053
R-squared		0.4414		0.4334	
F-statistics		6.1910		7.3431	
Prob (F-statistic)		0.0001		0.0000	
Durbin-Watson statistic		1.7612		1.7216	
Observation		50		50	

*Notes: SE denotes the coefficient standard errors. *, **, and *** indicate the level of significance at 10%, 5%, and 1% respectively*

Source: Author's calculations using E-views 8 software

The reduced form regression equation derived from the Results 2 columns of Model 1 can be written as follows.

$$g_{Y(t+1, t+5)} = -0.014 + 0.0457 \left(\frac{PI}{Y}\right)_t + 0.0036\Delta(gEX)_t + 0.209\left(\frac{GS}{Y}\right) - 0.010D_{shocks_t} - 0.009D_{conflict_t} \quad (5.1)$$

The findings of this study are consistent with the Keynesian hypothesis: the expansion of government expenditure leads to higher economic growth. In addition, the positive relationship between government expenditure and economic growth is consistent with the findings of Mallik and Chowdhury (2002) in the cases of Australia, Canada, Finland, New Zealand, Spain, Sweden, the UK and the US, Attari and Javed (2010) studied Pakistan, and Ranjan and Sharma (2008) studied the case of India.

5.3 Aggregated Government Consumption and Investment

Table 5.3 shows the results of regression of aggregated government consumption and investment. Most importantly, government consumption share of GDP has the expected positive coefficient at the statistically significant at 5% level. Government investment share of GDP has

the expected positive coefficient at the 5% significant level. Government investments provide the biggest impact on the economic growth of Sri Lanka.

Table 5.3: Regression Results on the Impact of Aggregated Government Consumption and Investment Expenditure on the Economic Growth of Sri Lanka from 1960 to 2013. (Model 2)

Dependable Variable: Five-year forward-moving average of real GDP growth rate					
Variable		Result 1		Result 2	
		Coefficient	SE	Coefficient	SE
Constant	β_0	0.0103	0.0119	0.0139	0.0111
Private investment (% of GDP)	β_1	0.0503*	0.0291	0.0458*	0.0258
Δ Growth of exports	β_2	0.0033*	0.0018	0.0036**	0.0018
Growth of labor force	β_3	0.0122	0.0148		
Government investment (% of GDP)	β_5	0.2255**	0.0589	0.2129***	0.0567
Government Consumption (% of GDP)	β_6	0.2034**	0.1009	0.1976*	0.1003
D _{SHOCKS}	β_7	-0.008**	0.0038	-0.009*	0.0054
D _{conflict}	β_8	-0.009**	0.0046	-0.010**	0.0046
R-squared		0.4418		0.4336	
F-statistics		5.2018		5.9963	
Prob (F-statistic)		0.0002		0.0001	
Durbin-Watson statistic		1.7507		1.7137	
Observation		50		50	

*Notes: SE denotes coefficient standard errors. *, **, and *** indicate the level of significance at 10%, 5%, and 1% respectively*

Source: Author's calculations using E-views 8 software

The reduced form regression equation derived from the Result 2 columns of Model 2 can be written as follows.

$$g_{y(t+1,t+5)} = -0.014 + 0.046\left(\frac{PI}{Y}\right)_t + 0.004\Delta(g_{EX})_t + 0.213\left(\frac{GI}{Y}\right)_t + 0.198\left(\frac{GC}{Y}\right)_t - 0.009D_{shocks}_t - 0.01D_{conflict}_t \quad (5.2)$$

The indicator of model quality shows that R-squared is around 44% in both models. This indicates that all included variables correctly explain the dependent variable (economic growth). The equation's overall F-tests are significant at a level above 1% in two models. This shows the explanatory power of included variables in the economic growth

5.4 Disaggregated government consumption

As mentioned above, government consumption expenditure is highly correlated with stimulating the economic growth of Sri Lanka. Therefore, we further analysed the impact of government consumption expenditure on economic growth by decomposing into functions. We selected seven functional sectors with the highest share of government consumption expenditure.

Government consumption of Education, Health, Welfare, Agriculture, Transportation and Communication, Energy and water, and Defence are used to estimate the impact of components of government consumption expenditure.

Table 5.4: Regression Results on the Impact of Components of Government Consumption Expenditure on Economic Growth of Sri Lanka from 1960 to 2013. (Model 3)

Dependable variable : Five-years forward-moving average of real GDP growth rate					
Variable		Result 1		Result 2	
		Coefficient	SE	Coefficient	SE
Constant	β_0	0.065***	0.0196	0.059***	0.0169
Private investment as a % of GDP	β_1	0.0130**	0.0056	0.0143*	0.0075
Δ Growth of exports	β_2	0.0053	0.0153		
Growth of labor force	β_3	0.0024	0.0031		
Government Investment as a % of GDP	β_5	0.1836***	0.0494	0.1925**	0.0913
Δ Government consumption in Welfare % GDP	γ_1	0.3358*	0.1807	0.363**	0.1487
Government consumption in Defense % GDP	γ_2	-0.4514**	0.2033	-0.323*	0.1737
Government consumption in Education % GDP	γ_3	-2.323***	0.5892	-2.034***	0.5302
Government consumption in Health % GDP	γ_4	2.543**	1.0834	2.2734**	0.9546
Government consumption in Agriculture % GDP	γ_5	0.8085*	0.4558	0.699*	0.4117
Government consumption in Transportation and Communication % GDP	γ_6	0.1288	0.5942		
Δ Government consumption in Energy and Water % GDP	γ_7	5.9103	4.1266		
D _{SHOCKS}	β_7	-0.0068**	0.0029	-0.0069**	0.0035
D _{conflict}	β_8	-0.0098*	0.0049	-0.0087**	0.0044
R-squared		0.4381		0.3766	
F-statistic		2.192		2.6179	
Prob(F-statistic)		0.0289		0.0180	
Durbin-Watson statistics		1.9082		1.6936	
Observation		50		50	

*Notes: SE denotes the coefficient standard errors. *, **, and *** indicate the level of significance at 10%, 5%, and 1%, respectively*

Source: Author's calculations using E-views 8 software

Table 5.4 presents regression results of the impact of components of government consumption. Result 1 of Model 3, which is the full model, uses all explanatory variables. As the control variables, growth rate of exports and growth rate of the labour force were not statistically significant. But, private investment and government investment were statistically significant at 5% and 1% respectively. As the main variables in the disaggregated model, government consumption expenditure on Transportation and Communication, and Energy and water, were

not statistically significant. Therefore, these insignificant variables were left out step-by-step in Result 2. All variables of components of government consumption expenditure were statistically significant, except government consumption on Transportation and Communication, and Energy and water, in both results in this model. Government consumption expenditure on Welfare, Agriculture, and Health has the expected positive coefficient at 5%, 1%, and 5% significance, respectively. Government consumption on Defence and education has not the expected positive coefficient, but are statistically significant. All dummy variables had the expected negative coefficient at 5%. The reduced-form equation derived from Result 2 of Model 3 can be written as follows.

$$\begin{aligned}
 g_{Y(t+1, t+5)} = & 0.059 + 0.014\left(\frac{PI}{Y}\right)_t + 0.193\left(\frac{GL}{Y}\right)_t + 0.363\Delta\left(\frac{GCWEL}{Y}\right)_t - 0.323\left(\frac{GCDEF}{Y}\right)_t - 2.034\left(\frac{GCEDC}{Y}\right)_t \\
 & + 2.273\left(\frac{GCHLT}{Y}\right)_t + 0.699\left(\frac{GCAGR}{Y}\right)_t - 0.007 D_{shocks_t} - 0.009 D_{conflict_t} + u_t \quad (5.3)
 \end{aligned}$$

This finding is consistent with the previous findings in developing countries by Landau (1986) and Deverajan, et.al (1996) and Abu and Abudullahi (2010). During the study period, it is obvious that the composition of government expenditure has changed drastically from government investment expenditure to consumption. This is further confirmed by Deverajan et al (1996), in which the developing country's government misallocated expenditures in favor of capital expenditures at the expense of current expenditures. Moreover, the spending policy of Sri Lanka depends heavily on political and social decisions (Dilrukshini, 2004).

In general, we can confirm that allocating government expenditure is not growth oriented. It depends on political pressure, intervention by other pressures like trade unions, civil struggles, and so on. For these reasons, the Sri Lankan Education sector is now facing some challenges, which may cause a negative impact from government consumption expenditure in Education.

Lack of uniformity in distribution of schools, students, and teachers and availability of teachers for specialized subjects such as Mathematics, Science, and IT have become obstacles to quality education. A significant increase in the number of teachers in schools was seen during the past few years. This has improved the student per teacher ratio from 20.5 in 2005 to 17.1 in 2011 (Teachers per student ratio from 0.05 to 0.06). Appendix 02 presents the teachers per student ratio and total number of teachers in Sri Lanka from 1950 to 2011. See Appendix 03 for Students per Teacher Ratio in Sri Lanka, and Appendix 04 for distribution of schools.

However, an oversupply of teachers for certain subjects, and a dearth of teachers for more demanding subjects, decreases the effectiveness of the system. Lack of uniformity in deployment of teachers to match the needs of schools also has contributed to these lapses.

These issues might have a negative effect on economic growth. The student per teacher ratio in Sri Lanka is the lowest among the South Asian countries. It has been reducing since 1950. Appendix 05 represents the comparison between students per teacher ratio in Sri Lanka with South Asian countries. However, student per teacher ratio in Sri Lanka is highest among the developed countries. The comparison between students per teacher ratio in Sri Lanka and selected developed countries are shown in Appendix 06. At present, Sri Lanka has reached the

unaffordable level of teachers. This indicates excess teachers in the education system and contributes to poor performance of teachers and students. Balasooriya (2012) further confirms this. He mentioned that the overall excess of teachers in schools was more than 21,672 in 2010, and the students per teacher ratio varied by province. This is largely due to the lack of proper teacher deployment practices in the education system.

Accordingly, big portions of government consumption expenditure are allocated for teacher salaries and other consumption expenditure in the education sector. Because of excess teachers, government consumption expenditure in the Education sector becomes unproductive and shows negative effects on economic growth. The composition of education expenditure is shown in Appendix 07.

However, government consumption in Defense expenditure indicates a negative and significant impact on economic growth. This finding is consistent with Shahbaz et al (2013) in the case of Pakistan economy; Tang (2008) in the case of Malaysia; Atesoglu (2002) in the case of United States; and Karagol and Palaz (2004) in the case of Turkey. We can conclude that increasing Defense expenditure may be harmful to the economic growth of Sri Lanka

5.5 Disaggregated Government Investment

Government investment plays a vital role in any economy, and it shows a significant positive relationship with economic growth in Sri Lanka. Decision makers allocate funds for the government investment in the different sectors of the economy. The composition of these allocations is important to enhancing the economic growth of the country. This study used the same six sectors of government investment that make the highest contribution to increasing government investment. These sectors Education, Health, Agriculture, Housing, Transportation and Communication, Energy and Water were employed to analyze the impact of component of government investment expenditure on economic growth.

Table 5.5 presents regression results on the impact of components of government investment expenditure from 1960 to 2013. Result 2 of Model 4 shows the reduced regression model results, since the full model, Result 1 of Model 4, indicates statistically insignificant variables.

Only government investment in Transportation and Communication, Agriculture, and Education were statistically significant. Government investment in Education, Transportation and Communication, and Agriculture had the expected positive coefficient with 5%, 5%, and 1% significant level respectively. The two dummy variables had the expected negative coefficient at 5% and 10% significance. The reduced form equation derived to show the influence of components of government investment on economic growth from Result 2 of Model 4 could be written as follows.

$$g_{y(t+1, t+5)} = 0.03 + 0.044\left(\frac{PI}{Y}\right)_t + 0.16\left(\frac{GC}{Y}\right)_t + 0.45\left(\frac{GITPC}{Y}\right)_t + 0.55\left(\frac{GIEDC}{Y}\right)_t + 0.44\left(\frac{GIAGR}{Y}\right)_t - 0.008D_{shocks_t} - 0.005D_{conflict_t} + u_t \quad (5.4)$$

However, government investment in Health expenditure indicates a positive and insignificant impact on economic growth. This finding is consistent with the previous studies of Devarajan et al (1996). Generally, increasing Health expenditure, considered an investment in

human capital, is expected to promote higher economic growth. Accordingly, the positive impact of Health expenditures on economic growth implies improvement in health status and productivity of human capital with a healthy nation.

Table 5.5: Regression Results on the Impact of Components of Government Investment Expenditure on Economic Growth of Sri Lanka from 1960 to 2013. (Model 4)

Dependable variable : Five-year forward-moving average of real GDP growth rate					
Variable		Result 1		Result 2	
		Coefficient	SE	Coefficient	SE
Constant	β_0	0.036***	0.0117	0.0304***	0.0095
Private investment as a % of GDP	β_1	0.0564*	0.0301	0.0438*	0.0231
Δ Growth of exports	β_2	0.0096	0.0149		
Growth of labor force	β_3	0.0013	0.0018		
Government consumption as a % of GDP	β_6	0.1638**	0.0615	0.1642***	0.0567
Government investment in Education % GDP	γ_8	0.5834*	0.3096	0.551**	0.2665
Government investment in Health % GDP	γ_9	0.8878	0.9805		
Government investment in Agriculture % GDP	γ_{10}	0.438***	0.1441	0.4360***	0.1339
Government investment in Transportation and Communication % GDP	γ_{11}	0.4602**	0.2229	0.4502**	0.2287
Δ Government investment in Energy and Water % GDP	γ_{12}	1.5476	1.3942		
Government investment in Housing % GDP	γ_{13}	0.2435	0.8317		
D _{SHOCKS}	β_7	-0.0134*	0.0074	-0.0079*	0.0042
D _{conflict}	β_8	-0.0100**	0.0050	-0.0054**	0.0022
R-squared		0.5686		0.4430	
F-statistic		4.5040		4.8863	
Prob (F-statistic)		0.0001		0.0004	
Durbin-Watson stat		1.8400		1.6319	
Observation		50		50	

*Notes: SE denotes the coefficient standard errors. *, **, and *** indicate the level of significance at 10%, 5%, and 1%, respectively*

Source: Author's calculations using E-views 8 software

Government investment in Agriculture shows a positive and highly significant impact on economic growth, with 0.436 coefficients and 1% significance. As an agricultural country, the Sri Lankan government has implemented many agricultural development programs to enhance

agricultural production throughout the country. Increasing expenditure on Agriculture enhances returns from agricultural production and has a large impact on poverty reduction, since the majority of the poor still live in the rural areas, where their main livelihood is agriculture.

Further, government investment in Transportation and Communication is also positively and highly significant for economic growth. It shows positive coefficients of 0.4502 and 5% significance. This suggests that an increase in this variable would also promote economic growth. The benefit of easy access to transportation enhances quality of life, economic livelihood, and social development. Furthermore, well-connected transportation networks link the rural poor to the economic mainstream, allowing access to other assets, including human, social, financial, and natural assets, and promote private sector participation in economic development.

Therefore, the results of this empirical study indicate that the impact of government expenditure on economic growth is varied among the different components of government investment and consumption. That means different types of government expenditures have a differential impact on economic growth.

As mentioned in Section 4: Methodology Specifications, Devarajan et. al (1996) says that the five-year average is long enough to capture long-term growth. However, we tried to analyze by using the seven-year and ten-year forward moving averages of real GDP growth rate, but the results did not change significantly. Please refer to Appendices 08, 09, 10 and 11.

6.0 Conclusion

In this study, we investigated the impact of government expenditure on the economic growth of Sri Lanka using time series data from 1960 to 2013 and employing the Ordinary Least Squares (OLS) technique. According to the empirical findings, government size has a positive impact on the economic growth of Sri Lanka. Both government investment and consumption have a positive and significant impact on economic growth. However, government investment provides the biggest impact on economic growth. Furthermore, this study found that private investment and exports promote economic growth, but growth in the labor force is not significant for the economic growth of Sri Lanka.

The empirical results of this study show that various types of government expenditure have a differential impact on economic growth. This indicates greater potential to improve the productivity of government expenditure by reallocating among sectors in a growth context. Accordingly, the results show that government consumption in Education has a negative, but statistically significant, impact on economic growth. The main possible reason for the negative impact of consumption in Education expenditure might be the unproductive expenses, because of excess teachers in the education sector (high teachers per student ratio). It creates the oversupply of teachers for certain subjects, and dearth of teachers for more demanding subjects.

Government consumption in Defense expenditure has a negative, but statistically significant impact on economic growth. Government consumption in Health, Agriculture and Welfare has a positive and statistically significant impact on economic growth. But, the government consumption in Energy and Water, and Transportation and Communication, is statistically insignificant for the economic growth of Sri Lanka.

Government investment in Education, Agriculture, and Transportation and Communication, has a positive and significant impact on economic growth. Government investment in Education provides the biggest impact on economic growth when compared to the other components in government investment. Government investment in Health, Housing, and Energy and Water has a positive, but statistically insignificant impact on the economic growth of Sri Lanka.

6.1 Policy Implications

Government size is positively associated with economic growth, while government investment provides the biggest impact. Increasing government expenditure in a growth context seems to be improving productivity. Accordingly, policy makers should consider improving the productivity of private investment by creating a supportive infrastructure environment, competitive trade policy, and tax incentives for existing and potential investors. Further, export promotion activities should be implemented to promote the economic growth.

Empirical results of this study indicate that various types of government expenditure provide differential impact on economic growth. Therefore, the efficiency of government expenditure can be improved by reallocating funds among sectors. In order to improve the productivity and promote economic growth, the government should increase its consumption expenditure on the Agriculture, Health, and Welfare sectors and investment expenditure on Education, Agriculture, and Transportation and Communication.

The excess teachers in the education sector may negatively affect productivity and economic growth. Hence, the quality of teachers should be improved while implementing a better teacher recruitment policy like school based recruitment policy to overcome excess teacher carder. As well as, it should maintain a peaceful and stable macroeconomic environment that will facilitate the economic growth of Sri Lanka.

6.2 Suggestions for Future Study

This study is limited to Sri Lanka, but it is important to compare the composition of government expenditure and economic growth in developing countries, or the South Asian region, to determine policy directions for future economic activities in the region. Therefore, it is suggested a similar study be conducted for the South Asian region. Furthermore, this study analyzed government expenditure and economic growth with few macroeconomic variables, but there are many macroeconomic and political variables, which can influence economic growth and government expenditure in any country. Hence, it is also recommended future studies add other relevant macroeconomic and political variables.

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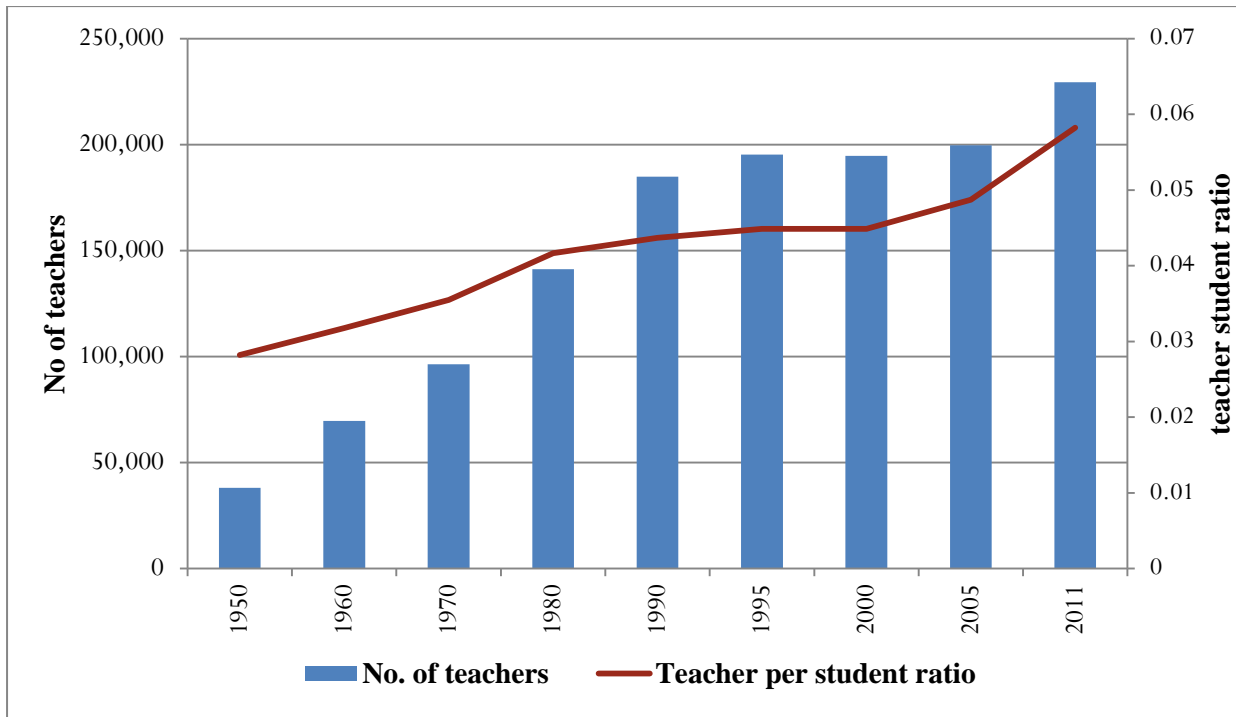
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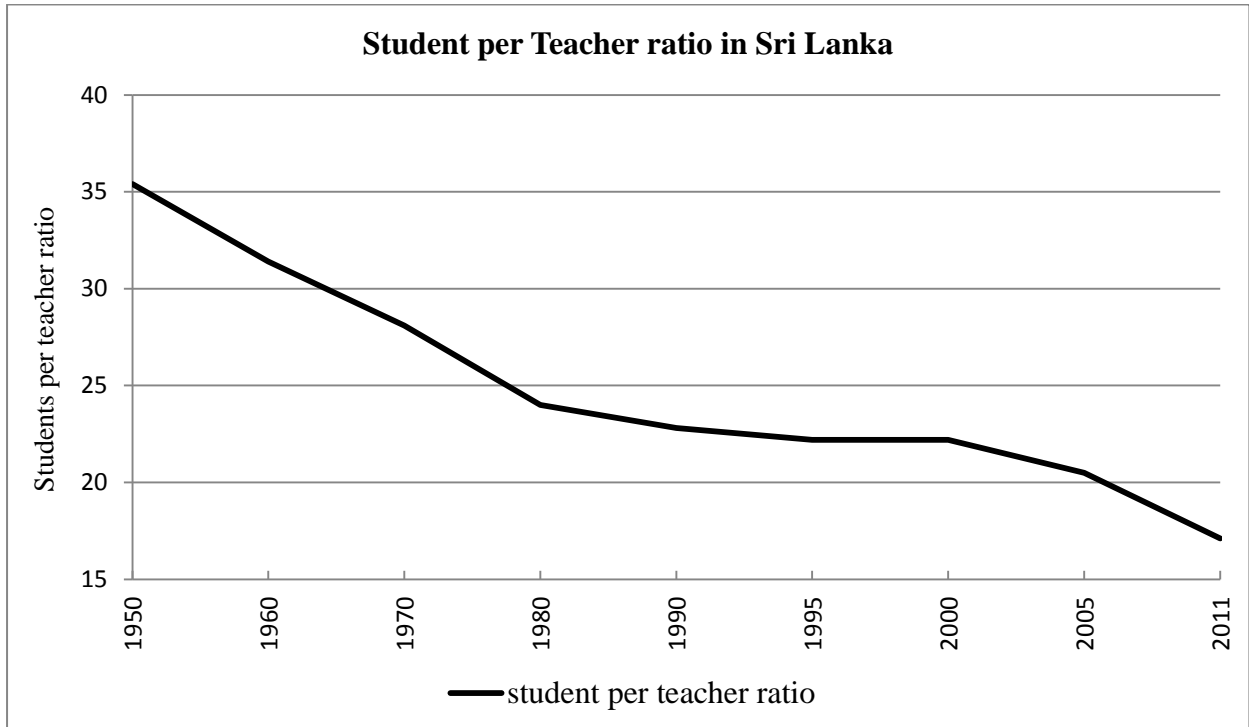
Appendix 01: Description of variables and Data sources

Data	Variables & Coefficients		Description	Source	Expected signs
GDP Growth	g_Y		Five-year forward-moving average of real GDP growth rate	Central Bank of Sri Lanka	Dependant variable
Private Investment	PI/Y	β_1	Ratio of private investment to real GDP	Central Bank of Sri Lanka	+
Exports	Δg_{EX}	β_2	First difference of annual growth rates of real exports	Central Bank of Sri Lanka	+
Labour force	g_L	β_3	Population growth rate (as a proxy)	World Bank	+
Government size	TGE/Y	β_4	Total government expenditure(%GDP)	Central Bank of Sri Lanka	+
Government investment (capital expenditure)	GI/Y	β_5	Ratio of government investment expenditure to real GDP	Central Bank of Sri Lanka	+
Government consumption(current expenditure)	GC/Y	β_6	Ratio of government consumption expenditure to real GDP	Central Bank of Sri Lanka	+
Government consumption on education, health, welfare, defense & agriculture, etc.	GC-EDC, HLT..... $\Delta GCWEL$ $\Delta GCENW$	γ_1 - γ_7	Ratio of each component of government consumption expenditure to real GDP	Central Bank of Sri Lanka	+
Government investment on education, health, transport and communication, housing & civil admin...etc	GI-EDC, TPC, HLT.... $\Delta IGENW$	γ_8 - γ_{13}	Ratio of each component of government investment expenditure to real GDP	Central Bank of Sri Lanka	+
Dummy for Economic Shocks	D_{SHOCKS}	β_7	Electricity & Production crisis in 2001, Lehman shock in 2009	2001 & 2009 =1, others = 0	-
Dummy for Internal conflicts	$D_{conflict}$	β_8	Internal conflicts in 1971,1972,1987,1988,1989	1971, 1972, 1987, 1988 & 1989 = 1, others = 0	-

Appendix 02: Teachers per Student Ratio and Number of Teachers in Sri Lanka



Appendix 03: Students per Teacher Ratio in Sri Lanka



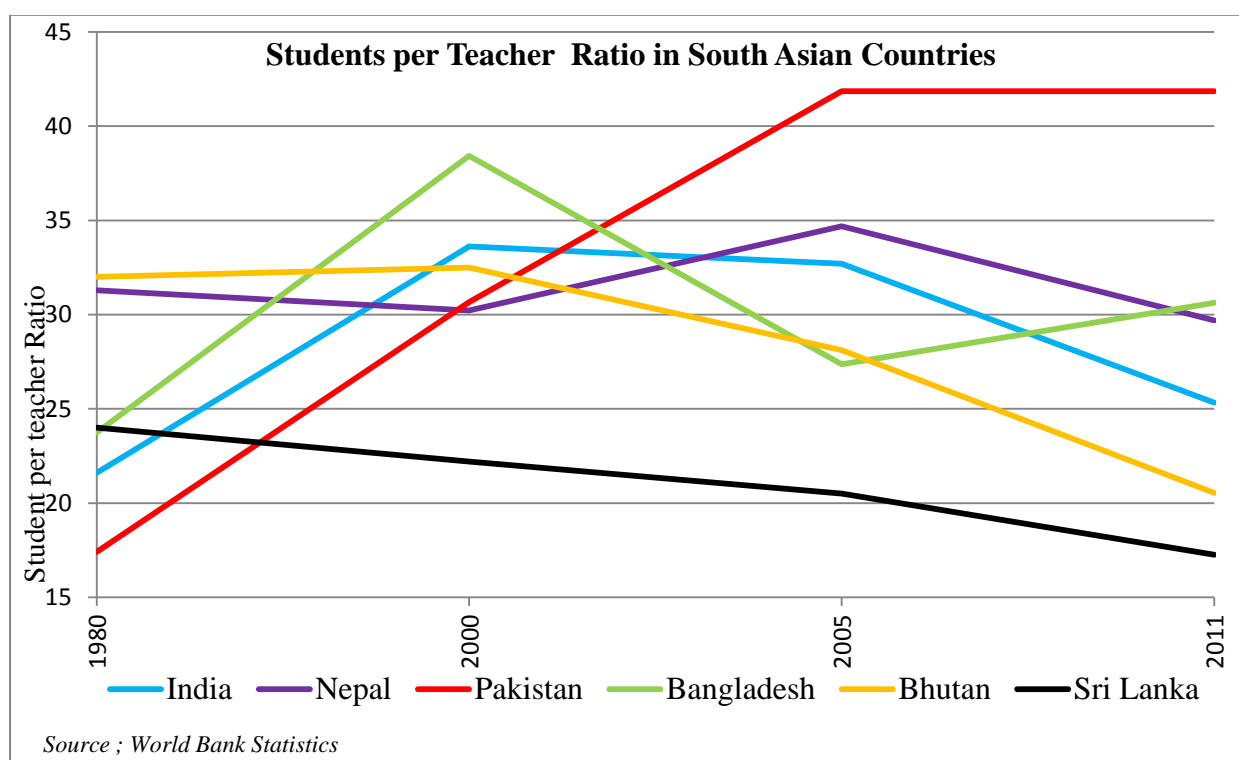
Appendix 04: Schools Based on Distribution of Students and Provincial and National Levels

No. of Students	Number of Schools									
	2006		2007		2008		2009		2010	
	No	%	No	%	No	%	No	%	No	%
01-50	1,549	16	1,533	16	1,554	16	1,510	16	1,590	16
50-2500	8,029	82.6	7,978	82.3	7,942	82	7,726	82	7,908	82
>2500	136	1.4	167	1.7	166	2	174	2	187	2
Total	9,714	100	9,678	100	9,662	100	9,410	100	9,685	100

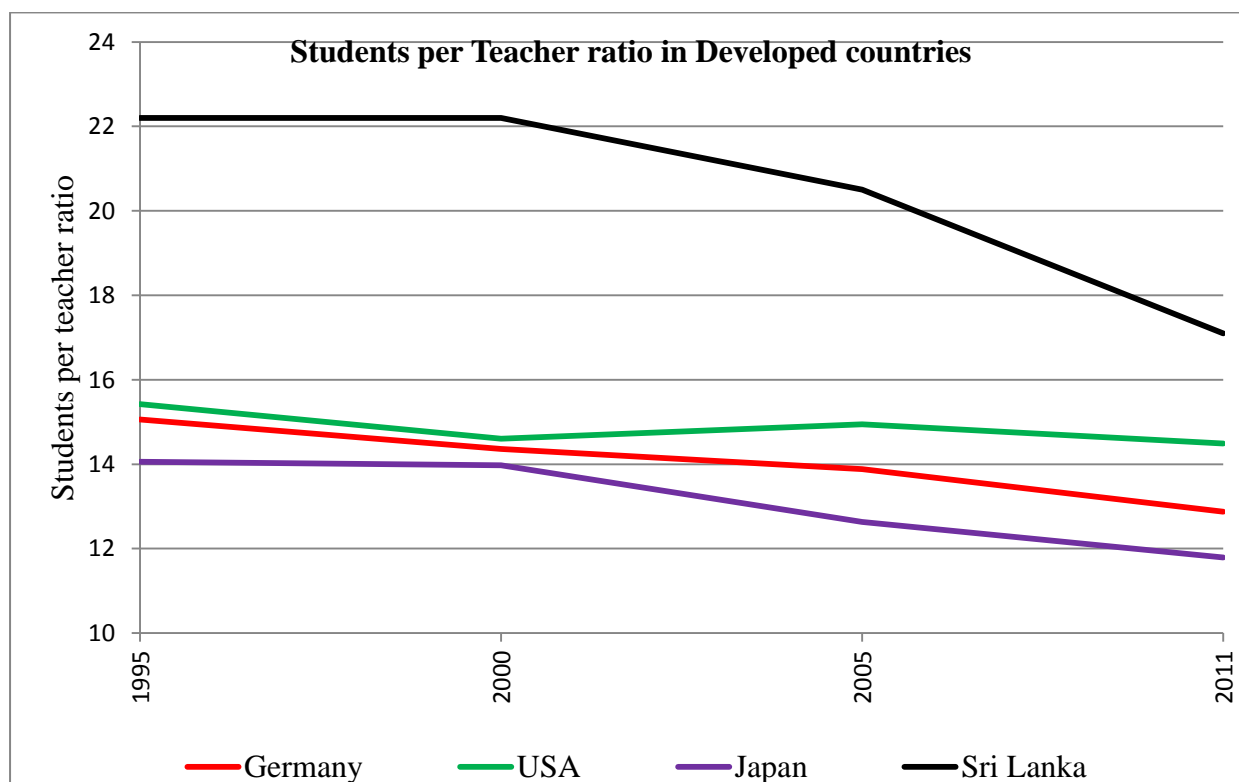
National Schools	342	4%
Provincial Schools	9389	96%
Total	9731	100

Source: Ministry of Education

Appendix 05: Comparison of Students per Teacher Ratios in Sri Lanka with Other South Asian Countries.



Appendix 06: Comparison of Students per Teacher Ratios in Sri Lanka with Developed countries.



Source: World Bank Statistics

Appendix 07: Composition of Education Expenditure 2005-2011 (Rs million)

	2005	2006	2007	2008	2009	2010	2011
Government consumption on Education	40,265	52,520	61,830	63,700	65,961	73,443	84,413
• Service delivery	32,765	43,546	50,599	52,521	53,359	60,015	69,799
• Teacher salaries	7,500	8,974	11,231	11,179	12,602	13,428	14,614
• School uniforms	1,060	963	1,067	582	1,260	949	1,364
• School textbooks	1,080	1,123	2,250	3,387	2,196	1,941	2,294
• Midday meals	166	722	1,308	1,649	2,251	2,474	2,630
Government Investments in Education	7,751	5,328	5,862	6,422	6,571	6,823	8,021
Total	48,016	57,848	67,692	70,122	72,532	80,266	92,434

Appendix 08: Regression Results on the Impact of Government Size on Seven and Ten-Year Forward-Moving Average of Real GDP Growth Rate of Sri Lanka from 1960 to 2013. (Model 1)

Variable	Dependent variable: Seven years forward-moving average of real GDP growth rate		Dependent variable: Ten years forward-moving average of real GDP growth rate	
	Coefficient	SE	Coefficient	SE
Constant	0.0313**	0.0128	0.0367***	0.0127
Private investment as a % of GDP	0.0202*	0.0113	0.0206*	0.0113
Δ Growth of exports	0.0069	0.0118	0.0028	0.0107
Growth of population	0.0089	0.0802	0.0075	0.0802
Government Size	0.1958***	0.0576	0.1457**	0.0613
Dummy for economic shocks	-0.0079**	0.0035	-0.0045	0.0031
Dummy for Internal conflicts	-0.0223**	0.0103	-0.0171*	0.0093
R-squared	0.5382		0.5878	
F-statistic	4.2285		2.6935	
Prob (F-stat)	0.0021		0.0272	
Dur-Watson stat	1.9490		1.9326	
Observations	48		45	

Appendix 09: Regression Results on the Impact of Aggregated Government Consumption and Investment on Seven and Ten Years Forward-Moving Average of Real GDP Growth Rate of Sri Lanka from 1960 to 2013. (Model 1)

Variable	Dependent variable: Seven years forward-moving average of real GDP growth rate		Dependent variable: Ten years forward-moving average of real GDP growth rate	
	Coefficient	SE	Coefficient	SE
Constant	0.0313**	0.0130	0.0763***	0.0079
Private investment as a % of GDP	0.0088***	0.0024	0.058***	0.0142
Δ Growth of exports	0.0070	0.0120	0.0010	0.0055
Growth of population	0.0025	0.0263	0.0018	0.0012
Government investment % GDP	0.197***	0.0605	0.116**	0.0446
Government consumption % GDP	0.1877*	0.1001	0.1036*	0.0525
Dummy for economic shocks	-0.0223**	0.0104	-0.0012	0.0050
Dummy for internal conflicts	-0.0078**	0.0036	0.00054	0.0017
R-squared	0.6382		0.6476	
F-statistic	3.5383		3.9350	
Prob (F-stat)	0.0047		0.0030	
Dur-Watson stat	1.9402		1.5339	
Observations	48		45	

Appendix 10: Regression Results on the Impact of Components of Government Consumption Expenditure on Seven and Ten Years Forward-Moving Average of Real GDP Growth Rate of Sri Lanka from 1960 to 2013. (Model 4)

Variable	Dependent variable: Seven years forward- moving average of real GDP growth rate		Dependent variable: Ten years forward- moving average of real GDP growth rate	
	Coefficient	SE	Coefficient	SE
Constant	0.065***	0.0131	0.082***	0.0099
Private investment as a % of GDP	0.008***	0.0025	0.0034*	0.0019
Δ Growth of exports	0.0008	0.0103	0.0044	0.0079
Growth of population	0.0162	0.0370	0.0399	0.0285
Government Investment as a % of GDP	0.1912**	0.0869	0.1992**	0.0812
Δ Government consumption in Welfare %GDP	0.409***	0.1214	0.2015**	0.0927
Government consumption in Defense %GDP	-0.478***	0.1575	-0.2911**	0.1207
Government consumption in Education % GDP	-1.837***	0.4071	-2.121***	0.3159
Government consumption in Health % GDP	2.132***	0.7333	2.687***	0.5696
Government consumption in Agriculture %GDP	0.9867**	0.3981	0.5171*	0.3033
Government consumption in Transportation % GDP	0.3768	0.3044	0.2485	0.2329
Δ Government consumption in Energy %GDP	2.0504	2.7629	2.9016	2.1146
Dummy for economic shocks	-0.025***	0.0093	-0.0147**	0.0072
Dummy for internal conflicts	-0.0066**	0.0033	-0.0054*	0.0031
R-squared	0.6091		0.6887	
F-statistic	4.1944		5.7873	
Prob (F-stat)	0.0003		0.0000	
Dur-Watson stat	1.4171		1.6639	
Observation	48		45	

Appendix 11: Regression Results on the Impact of Components of Government Investment Expenditure on Seven And Ten Year Forward-Moving Average of Real GDP Growth Rate of Sri Lanka from 1960 to 2013. (Model 4)

Variable	Dependent variable: Seven years forward- moving average of real GDP growth rate		Dependent variable: Ten years forward- moving average of real GDP growth rate	
	Coefficient	SE	Coefficient	SE
Constant	0.053***	0.0112	0.047***	0.0092
Private investment as a % of GDP	0.069**	0.0329	0.064***	0.0246
Δ Growth of exports	0.0103	0.0112	0.0080	0.0096
Growth of population	0.0067	0.0084	0.0063	0.0082
Government Consumption as a % of GDP	0.1048*	0.0593	0.1277**	0.0516
Government investment in Education % GDP	0.614**	0.2548	0.6749***	0.1583
Government investment in Health %GDP	0.6278	0.7487	0.5791	0.6074
Government investment in Agriculture %GDP	0.5426**	0.2248	0.5225**	0.2596
Government investment in Transportation %GDP	0.4984***	0.1821	0.5120***	0.1874
Δ Government investment in Energy %GDP	0.1374	0.1128	0.1264	0.2010
Government investment in Housing %GDP	0.5777	0.6656	0.5238	0.5446
Dummy for economic shocks	-0.0235**	0.0100	-0.0146*	0.0082
Dummy for internal conflicts	-0.0089**	0.0038	-0.0065**	0.0031
R-squared	0.5554		0.6029	
F-statistic	3.7473		4.4286	
Prob (F-stat)	0.0010		0.0002	
Dur-Watson stat	1.7330		1.9417	
Observation	48		45	