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The Impact of Sectoral Government Expenditure on Economic Growth: Evidence from Sri Lanka

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Abstract

This paper investigates the impact of sectoral government expenditure on economic growth using Sri Lanka as a case study. For this purpose, we use Sri Lankan data at the national and sectoral levels for the period 1985-2016. In the empirical analysis, six different models were estimated at the aggregate and sectoral levels taking two cases of the dependent variable, namely the real GDP and per capita real GDP growth rate. Results indicate that government expenditure plays a positive and significant role in improving the level of GDP in Sri Lanka. However, economic growth was lower during the war years compared to non-war years in Sri Lanka. The results also indicate that capital expenditure plays a positive and significant role in enhancing economic growth. At the sectoral level, expenditure on health, education, and transport and communication appear to have a positive impact on the economy, while expenditure on agriculture and irrigation demonstrate a negative impact. Expenditure on defence, on the other hand, indicated mixed results, depending on the model specification. These findings provide some important insights for the policy makers in the country to consider when allocating sectoral level government expenditure budgets.

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1 Introduction

Over the past two decades, there has been accelerated growth in government expenditure in both developed and developing countries. However, on average, government expenditure in developing countries is much less than that of the developed countries. In the mid-200s in developed economies, for example, the share of government expenditure accounted for more than 50 per cent of Gross Domestic Production (GDP), on average, while that in low income countries was only about 25 per cent (IMF, 2014). Amongst the developing countries across all regions, Asia experienced the most rapid growth in government expenditure, while growth in Africa and Latin America demonstrated a much slower pace. When considering Asia, with the exception of Sri Lanka and Myanmar, all countries in the region at least doubled their government expenditure (in 2000 international dollars) for the period 1980 to 2002 (Fan and Rao, 2003).

Government expenditure enables governments to achieve two goals: (1) to produce and purchase goods and services, and (2) to redistribute income. The magnitude and growth in government spending has led to a considerable amount of research investigating the link between government expenditure and economic growth measured by GDP (for example, see Barro, 1990; Aschauer, 1989; Tanzi and Zee, 1996). However, the empirical findings on this topic for both developed and developing countries demonstrate mixed results, with policy makers also divided as to whether government expenditure promotes or hinders economic growth. For example, Ram (1986), Barro (1990) and Belgrave and Craigwell (1997), find that there is a positive relationship between government expenditure on education, research and development, and health and economic growth. On the other hand, some studies, such as Landau (1983) and Levine and Renelt (1992), find that there is a negative relationship between government expenditure and, in particular, current consumption expenditure and economic growth.

While the link between total government expenditure and economic growth is an important consideration, an equally important aspect is the composition of government expenditure and its contribution to economic growth. This is because the expenditure composition reflects the government's spending priorities. In recent years, the composition of government expenditure has shown interesting patterns in both developed and developing countries. In developed countries, public social spending, such as old age pension, survivors and disability benefits, unemployment compensation, health services and housing (excluding capital expenditure) outstrips the public investment expenditure (which includes gross capital formation of plant and equipment including that in hospitals, schools and housing), government consumption expenditure (which includes expenditure on defence and justice), and market goods and services provided as individual social goods. For example, in OECD countries, during the period of 1995-2011, the average public social spending was about 20 per cent of GDP, and almost twice as large as government consumption spending which accounted for only 11.4 per cent of GDP (Connolly and Li, 2016). On the other hand, in developing countries across Asia and Africa, expenditure on education, defence and agriculture ranks the highest. For example, government expenditure on education in South Asia is on average 3.5 per cent as a percentage of GDP. This is among the highest in the world (Siddiqui, 2015). The defence and agriculture spending are ranked second and third, respectively (Fan and Rao, 2003). Government spending on these sectors appears to be substantially larger in the Asian region, in general, than the expenditure on infrastructure, social security and health.

However, there appears to be no consensus in empirical findings in terms of which sectoral government expenditure promotes economic growth. For example, based on a set of cross-country regressions, Easterly and Rebelo (1993) find that, in developing countries, there is a positive relationship between government expenditure on transport and communications and economic growth. While Kormendi and Meguire (1985), Grier and Tullock (1989) and Summers and Heston (1988) classify defence and education as unproductive government spending, Barro (1991) finds them as productive. Devarajan *et al.* (1996), however, conclude that seemingly productive expenditures could also become unproductive when used in excess. The mixed results found in the literature on the impact of sectoral level government expenditure on economic growth imply that countries need to prioritize government spending to reap the potential benefits by reallocating resources appropriately. To this end, it is important that individual countries identify their productive sectors and unproductive sectors with respect to their individual country needs and circumstances.

The objective of this study is two-fold: (1) to examine the impact of total government expenditure on economic growth, and (2) to investigate the differential impacts of various sub-categories of government expenditures on economic growth, using Sri Lanka as a case study. These expenditure sub-categories include, civil administration, defence, public order and safety, education, health, welfare and community services, housing, agriculture and irrigation, energy and water supply, and transport and communication. Sri Lanka is an ideal case study in this regard for three reasons. Firstly, there have been some remarkable patterns and emerging trends in the composition of government expenditure in Sri Lanka. For example, the civil war[2], during 1981-2009, resulted insignificantly high government spending on defence and public safety, and welfare and community services with, on average, 6.5 per cent and 15.2 per cent as a percentage of total government expenditure, respectively. Furthermore, there has been an overall increase in government spending on health, transport and communication, and education, while the spending on agriculture and irrigation has seen a gradual decline over the years. Therefore, it is worthwhile investigating the effects of these compositional patterns and changes in government expenditure on economic growth in a post-war developing country such as Sri Lanka. Secondly, while, in general, there is only limited empirical evidence available on the contribution of various government expenditure types on economic growth in the context of Sri Lanka, existing studies do not consider the data from the post-war period, as these studies were predominantly conducted before the end of the war. Thirdly, an in-depth analysis of the link between government expenditure, at the aggregate level as well as at the sectoral level, is expected to provide some important policy implications in terms of post-war development in Sri Lanka. For example, after the conclusion of the civil conflict in 2009, the on-going debate on how to allocate the resulting 'peace dividend' to social programs and/or to build domestic infrastructure necessitates a careful macroeconomic policy consideration with respect to the composition of government spending. Such an investigation would also provide some important policy insights for countries with similar socio-economic background.

The rest of the paper is organized as follows. Section 2 presents a review of literature on the link between government expenditure and economic growth. Section 3 presents an overview of the government expenditure patterns in Sri Lanka and provides a brief description of the data used in this study. Section 4 presents the methodology adapted in this study together with an empirical analysis and discussion of the results. Section 5 provides some concluding remarks.

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[2] The war between Sri Lankan armed forces and Liberation Tigers of Tamil Eelam (LTTE).

2 Literature Review

In this section, we review studies that analyse the relationship between economic growth and (i) total government expenditure, (ii) sectoral level government expenditure, and (iii) total and sectoral government expenditure specific to Sri Lanka.

Economic growth and total government expenditure

While many studies have investigated the relationship between aggregate level government expenditures and long-run economic growth, there is no consensus among the results. In general, based on Keynesian and neo-classical schools of thought, government expenditure stimulates economic growth hence there is a positive relationship between government expenditure and economic growth (See for example, Chude and Chude, 2013; Njoku et al, 2014; Agbonkhese, 2014; Onakoya and Somoye, 2013; Lahirushan and Gunasekara, 2015). However, a number of studies also argue that government expenditure generally has a negative growth effect (See for example, Aschauer and Greenwood, 1985; Barro, 1990; Devarajan et al, 1996; Egbetunde and Fasanya, 2013; Stefan and Magnus, 2001; Awomunse, Olorunleke and Alimi, 2013; Landau, 1983; Grier and Tullock, 1989). The reason behind their argument is that while government expenditures provide utility to households, it requires higher taxes in order to finance those expenditures. In turn, these higher taxes reduce returns on investments and the incentive to invest and lead to a negative effect on economic growth. In a cross-country study of 115 countries, Grier and Turlock (1987) found a significant negative relationship between the growth rate of real GDP and government's expenditure share of GDP. However, some studies reveal that there is no relationship between government expenditure and economic growth. For example, Ansari *et al.* (1997) show that there is no evidence of any significant relationship between total government expenditure and the level of national income in Ghana, Kenya and South Africa.

When there is a relationship between government expenditure and economic growth, there exists a concern as to whether the existing relationship has a bi-directional or uni-directional causality. There are two main theoretical prepositions – *Wagner's law* and *Keynesian hypothesis* – to explain the direction of causality in the relationship between government expenditure and economic growth. Much of the recent work looking at this has tested both Wagner's law and Keynesian hypothesis by examining the bi-directional causality between the two variables (Henrekson, 1993;Sing and Sahni, 1984; Ansari and Singh, 1997). Wagner's law suggests that economic growth positively influences government expenditure. This implies that as an economy grows, the fiscal authorities tend to increase the level of government expenditure, particularly on social services and transfers, infrastructure, and on a range of other economic services (Levitt and Joyce, 1987). Srinivasan (2013), using data for India, provided evidence for the presence of a positive relationship between government expenditure and economic growth in the short-run as well as in the long-run. The results reveal a one-way causality running from economic growth to public expenditure, supporting Wagner's law. Keynesian hypothesis, on the other hand, suggests that the government expenditure is an exogenous policy tool that can be used to influence economic activities in the short-run. Hence, government expenditure harnesses economic growth. The arguments underlying the reasons for this positive influence of public spending on economic growth are, as Ram (1986) discusses, (1) government involvement may enhance a greater level of productive investment, and (2) government involvement may harmonize conflicting interest between private sector and

society. In contrast, the opponents argue that excessive government involvement is likely to be detrimental to economic growth, suggesting a negative causal relationship running from government expenditure towards economic growth. This is because the inefficiencies associated with government operations appear to lower the productivity of the system. Barro (1990) suggests that higher taxation associated with government expenditure distorts the economic incentives, such as incentives to save, incentive to invest as well as to innovate, which, in turn, hinders economic growth. Biswal *et al.* (1999), using Canadian data, found that total government current expenditure and total current expenditure on goods and services appear to have a long run bi-directional positive relationship with economic growth, confirming both Wagner's law as well as Keynesian hypothesis.

There is also some evidence in the literature showing there is no significant relationship (positive or negative) between sectoral government expenditure and economic growth. For example, Musaba *et al.* (2013), using data for Malawi for the period 1980 to 2007, found that there is no (statistically) significant relationship between sectoral government expenditures and economic growth in the short-run. Biswal *et al.* (1999) found that transfer payments to persons and businesses, government investment, interest on public debt, wages and salaries, and expenditure on other goods and services do not appear to have any significant relationship with GDP. Bose *et al.* (2007) indicated that government current expenditure does not have a statistically significant relationship with economic growth. Schaltegger and Torgler (2006) found that there is no significant impact of government capital expenditure on economic growth in Switzerland.

Economic growth and sectoral level government expenditure

According to Bose *et al.* (2007), the proportion of government capital expenditure to GDP is positively related with economic growth. Furthermore, government expenditure on education is also found to harness economic growth. Kneller *et al.* (1999) found that productive expenditures, such as expenditure on general public services, defence, education, health, housing, transport, and communication, enhance growth. Musaba *et al.* (2013), using data for Malawi for the period 1980 to 2007, provide evidence of a positive relationship between agriculture and defence expenditure and economic growth in the long-run.

According to Devarajan *et al.* (1996), expenditures that are normally considered as productive could also become non-productive when resources are misallocated. For example, government capital expenditure, which act as an engine of growth in many instances, appear to have hindered economic growth particularly in developing countries due to misallocation of government resources. Kneller *et al.* (1999) found non-productive expenditures, such as expenditure on social security and welfare, recreation, and economic services, demonstrate a negative relationship with economic growth.

There is some evidence in the literature to suggest there is no significant relationship (positive or negative) between sectoral government expenditure and economic growth. For example, Musaba *et al.* (2013), using data for Malawi for the period 1980 to 2007, found that there is no (statistically) significant relationship between sectoral government expenditures and economic growth in the short-run. Biswal *et al.* (1999) found that transfer payments to persons and businesses, government investment, interest on public debt, wages and salaries, and expenditure on other goods and services, do not appear to have any significant relationship with

GDP. Bose *et al.* (2007) indicated that government current expenditure does not have a statistically significant relationship with economic growth. Schaltegger and Torgler (2006) found that there is no significant impact of government capital expenditure on economic growth in Switzerland.

Economic growth and government expenditure: Sri Lankan evidence

While less than a handful studies are available on this topic in relation to Sri Lanka, they are similar to findings in the literature for other countries in that they provide mixed results. For example, Ranasinghe and Masaru (2014), using data for the period of 1960 to 2013, found that the size of the government is positively associated with economic growth in Sri Lanka. They also found that government investment expenditure creates the biggest impact on growth. Additionally, they reveal that government consumption expenditure on agriculture, health and welfare, and government investment expenditure on education and transportation, and communication has a positive and significant impact on economic growth. Comparatively government consumption expenditure on education and defence has a negative and significant impact on economic growth. Selvanathan and Selvanathan (2014), using data from 1975-2013, found that defence expenditure causes economic growth in Sri Lanka. Ravinthirakumaran and Kesavarajah (2011) using time-series data for the period of 1977 to 2009 reveal that government expenditure on education and transport, and communication has a positive impact on economic growth, whereas expenditure on health and defence shows a negative impact on economic growth. On the other hand, Dilrukshini (2004), using time series data for the period 1952 to 2002, concludes that Sri Lankan data does not provide evidence for a positive or negative relationship between economic growth and government expenditure.

This study differs from existing Sri Lankan studies and makes a significant contribution in analysing the link between economic growth and total government expenditure in four ways. First, this study uses the most recent Sri Lankan data, including the post-war period, for the empirical analysis. Second, this study uses recently developed econometric techniques to present a scientific analysis. Third, the existing studies show mixed results with respect to the link between government expenditure and economic growth due to differences in the dependent variables, such as real GDP or per capita real GDP growth rate, used in their model specification. In this study, we have estimated our model with both dependent variables in order to assess the robustness of our conclusions, and in this way our study, lastly, uses a more disaggregated sectoral level data of government expenditures.

3 Preliminary Data Analysis

In this section, we investigate empirically the relationship between economic growth (or GDP) and government expenditure in Sri Lanka at three levels: (1) total government expenditure at aggregate level; (2) total aggregate expenditure divided into total government capital expenditure and total government consumption (recurrent) expenditure; and (3) total government expenditure divided into various sectoral components such as education, defence, health, transport and communication, housing, civil administration, welfare, housing, agriculture, energy. The data used in this study are from various annual reports of the *Central Bank of Sri Lanka* for the period 1985 to 2016. The analysis presented in this paper will answer the following questions; “What is the causal relationship between economic growth and government expenditure?”, “Which components of government expenditure significantly

influence higher economic growth?" and "What is the impact of civil war on government expenditure and economic growth?"

Figures 1 and 2 below present the time series plots of all the variables under consideration in our analysis. In addition, table 1 shows total government expenditure expressed as a percentage of GDP and each sectoral expenditure expressed as a percentage of total government expenditure.
As can be seen from the individual figures in Figure 1, both the real GDP and total government expenditure (TGE) have increased steadily over the sample period 1985-2016. However, the total government expenditure as a proportion of GDP, has steadily declined and almost halved from 42 percent in 1985 to 22 percent in 2016. Total capital expenditure (TCE) was declining until 2004 but has increased steadily thereafter, while total recurrent expenditure (TRE) has an increasing trend throughout 1985-2016.

Figure 2 presents the plots of the sectoral government expenditures. As can be seen, health expenditure (HEALTH) has increased steadily after the conclusion of the war, although there was a fall during 2008-2010 Defence expenditure (DEFENCE) has continued to increase with some ups and downs based on the war-peace years until the end of the war and, surprisingly, continued to increase for a couple of years even after the end of the war. It then declined until 2013, however, it is again on a sharp increase. Government expenditure on transport and communication (TRANS) fluctuated around a constant value until 2002 before then skyrocketing from 2003. This is particularly due to the previous government's (2004-2015) ambitious plans around physical infrastructure development which involved upgrading the air and road transport network and the telecommunication network. These transport and communication projects were further expanded to the Northern war-torn areas as part of the post-war development, particularly with financial assistance from China (Central Bank of Sri Lanka, 2017). Nevertheless, since the new government came into power in January 2015, many infrastructure projects started by the former government were put on hold in the lead-up to the decline in government expenditure on transport and communication over the last few years.

Government expenditure on the agriculture and irrigation sector (AGRI) did not have much government attention until 2004, but then had a slight increase until 2013 and a sharp increase in recent years. Conversely, government expenditure on education (EDU) has increased almost three times during the sample period. Civil administration expenditure (CIVIL) has fluctuated within a small band until 2013 and has increased sharply from 2013 onwards. In relation to housing expenditure (HOUS), the government's contribution was stable throughout the sample period. However, a number of unusual peaks during 1996, 2005 and 2014 are noticeable, which may be due to the government policies around building more houses for the families of the Sri Lankan armed forces who have lost their breadwinner during the war. Government expenditures on welfare payments (WEL) have also increased sharply, with a few fluctuations, due to the support given to those from the Sri Lankan armed forces who were disabled by the war and energy and water supply (ENERG)

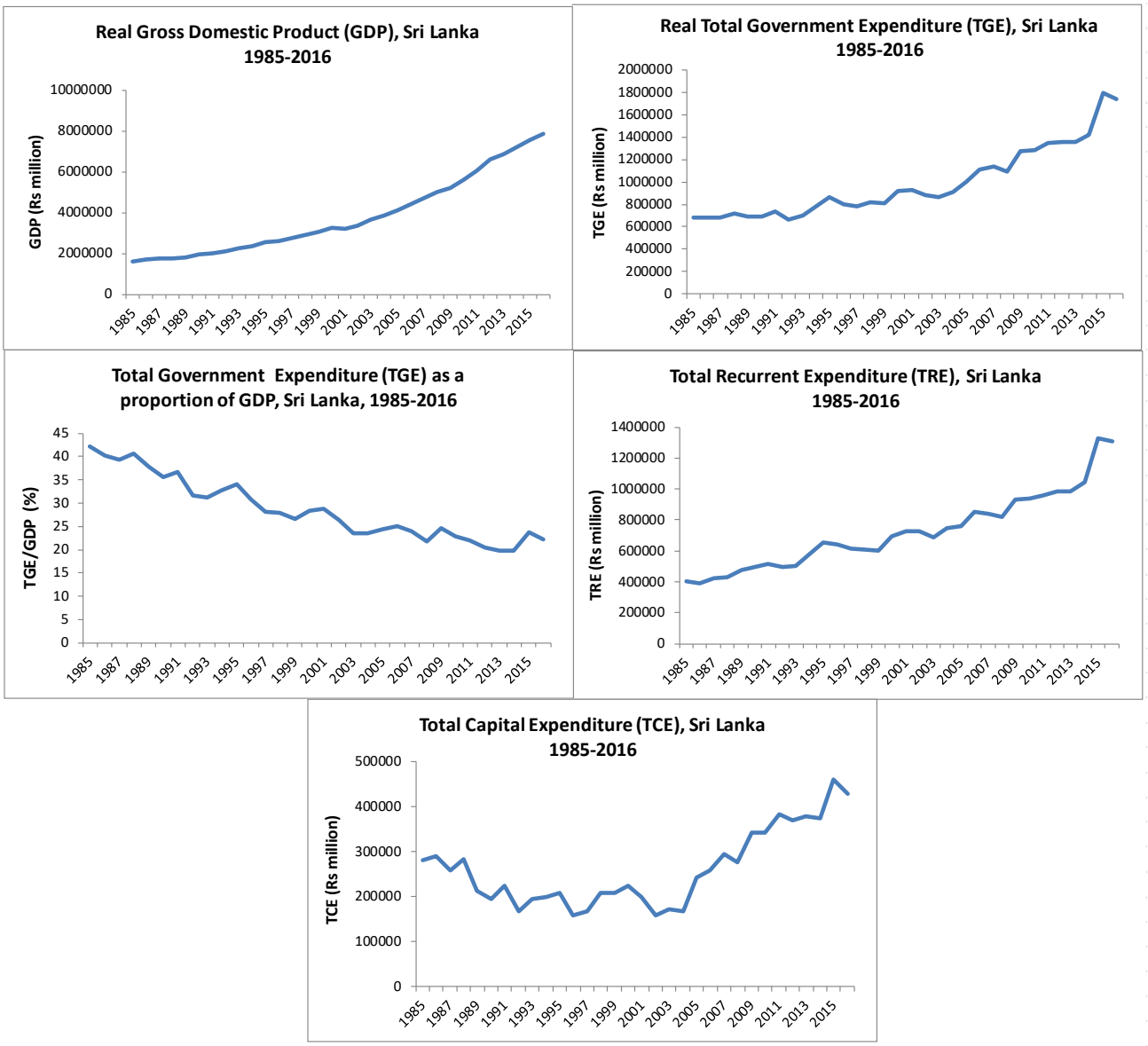

Figure 1: GDP, Total Government Expenditure, TGE as a percentage of GDP, Total Capital Expenditure and Total Recurrent Expenditure, Sri Lanka, 1985-2016

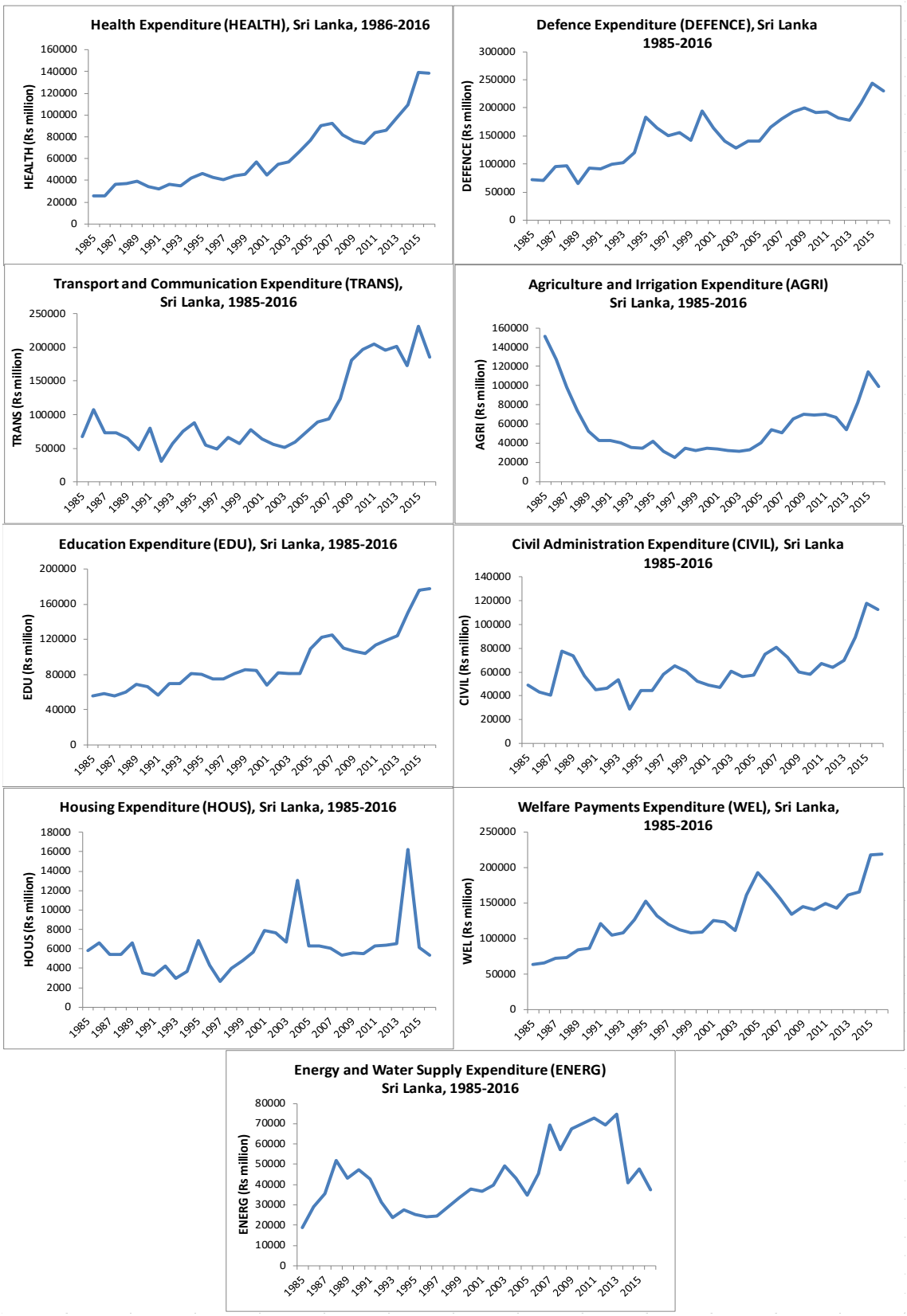

Figure 2: Government Expenditure on the nine Major Expenditure Sectors, Sri Lanka, 1985-2016

Column 2 of Table 1 presents the total government expenditure as a proportion of GDP. Columns 3 and 4 of the same table present the recurrent government expenditure and capital government expenditure as a proportion of the total government expenditure, and columns 5-= to 16 of the table present the sectoral government expenditure as a proportion of total government expenditure. As can be seen, the total government expenditure as a proportion of GDP in Sri Lanka has declined from 42.2 per cent in 1985 to a low 22.1 per cent in 2016. Government recurrent expenditure has increased from 59.1 per cent in 1985 to 75.3 per cent in 2016 at the expense of capital expenditure share, which has fallen from 40.9 per cent in 1985 to a low 24.7 per cent in 2016. On average, the sectors that attracted significant government attention are defence (15.2%), welfare payments (13.4%), transport and communication (9.8%) and education (9.4%), while housing (0.6%) and energy and water supply (4.5%) expenditure received the least attention from the government.

Table 2 presents the summary measures of the expenditure data in aggregate and disaggregate form. As can be seen from the coefficient of variation values given in column 4, transport and communication (0.58), agriculture and irrigation (0.53), and health (0.49) have large variations in their government expenditure allocation while civil administration (0.31), welfare payments (0.31) and defence (0.32) have the least variation in government expenditure allocation.

4. Model Estimation

Since we use time-series data for the empirical analyses, we should first investigate the time series properties of the variables of interest, namely, real gross domestic product (RGDP), total government expenditure (TGE), total capital expenditure (TCE), total recurrent expenditure (TRE), defence expenditure (DEFENCE), welfare payments expenditure (WEL), transport and communication expenditure (TRANS), education expenditure (EDU), health expenditure (HEALTH), civil administration expenditure (CIVIL), agriculture and irrigation expenditure (AGRI), energy and water supply expenditure (ENERG) and housing expenditure (HOUS).

Table 1: Government expenditure (% of GDP), Total capital, Total recurrent and Sectoral expenditures (as % of total government expenditure), Sri Lanka, 1985-2016

	Government	As a % of total government expenditure		Sectoral Expenditures as a % of total government expenditure										
Year	Expenditure as a % of GDP	Total Recurrent Expenditure	Total Capital Expenditure	Defence	Welfare Payments	Transport & Communication	Education	Civil Administration	Agriculture & Irrigation	Health	Energy & Water Supply	Housing	Interest Payments	Other
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
1985	42.2	59.1	40.9	10.6	9.3	9.8	8.1	7.2	22.1	3.8	2.7	0.9	21.2	4.4
1986	40.2	57.4	42.6	10.4	9.6	15.7	8.5	6.3	18.7	3.8	4.3	1.0	18.4	4.4
1987	39.2	61.9	38.1	14.0	10.5	10.7	8.1	6.0	14.4	5.3	5.2	0.8	19.8	7.6
1988	40.7	60.3	39.7	13.6	10.3	10.3	8.3	10.8	10.4	5.1	7.2	0.8	17.4	5.8
1989	37.9	69.2	30.8	9.5	12.2	9.5	9.9	10.7	7.6	5.6	6.2	1.0	23.2	6.2
1990	35.6	71.9	28.1	13.4	12.4	6.9	9.6	8.2	6.2	5.0	6.9	0.5	25.2	4.4
1991	36.7	69.6	30.4	12.4	16.3	10.8	7.6	6.1	5.8	4.3	5.8	0.4	24.7	3.2
1992	31.6	74.8	25.2	15.1	15.8	4.6	10.5	7.0	6.1	5.5	4.7	0.6	24.8	4.8
1993	31.1	72.2	27.8	14.7	15.4	8.1	9.9	7.7	5.1	5.0	3.4	0.4	24.0	7.4
1994	32.6	74.4	25.6	15.5	16.2	9.7	10.4	3.7	4.5	5.4	3.5	0.5	25.7	3.1
1995	34.0	75.8	24.2	21.2	17.7	10.3	9.3	5.2	4.9	5.4	2.9	0.8	20.5	3.6
1996	30.7	80.1	19.9	20.5	16.6	6.9	9.3	5.6	3.9	5.4	3.0	0.5	24.8	4.5
1997	28.2	78.6	21.4	19.1	15.3	6.2	9.5	7.4	3.2	5.2	3.1	0.3	26.6	4.5
1998	27.9	74.4	25.6	19.0	13.7	8.1	10.0	8.0	4.3	5.4	3.6	0.5	22.8	4.6
1999	26.7	74.2	25.8	17.4	13.3	7.0	10.5	7.5	4.0	5.6	4.2	0.6	25.2	4.5
2000	28.4	75.7	24.3	21.1	11.9	8.5	9.2	5.7	3.8	6.2	4.1	0.6	25.3	3.5
2001	28.7	78.5	21.5	17.7	13.5	6.9	7.3	5.3	3.6	4.9	4.0	0.8	32.0	3.8
2002	26.4	82.1	17.9	15.9	13.9	6.4	9.2	5.3	3.6	6.2	4.5	0.9	31.4	2.6
2003	23.5	80.1	19.9	14.8	13.0	6.0	9.4	7.1	3.7	6.6	5.7	0.8	31.9	2.2
2004	23.6	81.7	18.3	15.4	17.7	6.4	8.9	6.1	3.6	7.2	4.7	1.4	28.0	2.8
2005	24.4	75.8	24.2	14.0	19.3	7.4	10.9	5.7	4.0	7.7	3.5	0.6	24.9	3.3
2006	25.1	76.8	23.2	14.9	15.8	8.0	11.0	6.7	4.9	8.1	4.1	0.6	22.5	5.1
2007	24.0	74.0	26.0	16.0	13.7	8.3	11.0	7.1	4.5	8.2	6.1	0.5	22.1	3.8
2008	21.8	74.7	25.3	17.7	12.2	11.3	10.0	6.6	5.9	7.5	5.2	0.5	21.6	2.5
2009	24.6	73.2	26.8	15.7	11.4	14.2	8.4	4.7	5.5	5.9	5.3	0.4	25.7	3.5
2010	22.8	73.2	26.8	15.0	11.0	15.4	8.1	4.5	5.4	5.8	5.5	0.4	27.8	2.2
2011	22.1	71.5	28.5	14.4	11.1	15.2	8.5	5.0	5.2	6.2	5.4	0.5	25.1	2.0
2012	20.4	72.7	27.3	13.4	10.5	14.5	8.8	4.7	4.9	6.4	5.1	0.5	26.6	1.8
2013	19.8	72.2	27.8	13.0	11.9	14.8	9.1	5.1	4.0	7.2	5.5	0.5	27.2	2.8
2014	19.7	73.7	26.3	14.7	11.7	12.2	10.6	6.3	5.8	7.7	2.9	1.1	24.4	3.4
2015	23.7	74.3	25.7	13.6	12.1	12.9	9.8	6.6	6.4	7.8	2.7	0.3	24.0	4.3
2016	22.1	75.3	24.7	13.2	12.6	10.7	10.2	6.5	5.7	8.0	2.1	0.3	26.3	5.2
Mean	28.6	73.1	26.9	15.2	13.4	9.8	9.4	6.5	6.3	6.0	4.5	0.6	24.7	4.0

Table 2: Summary measures of the real GDP, real government expenditure and sectoral government expenditures, Sri Lanka, 1985-2016

GDP and Government Expenditure	Mean	Standard Deviation	Coefficient of variation
(1)	(2)	(3)	(4)
Real GDP (RGDP)	3807414	1921525	0.50
Real Government Expenditure (GE)	984798	312901	0.32
Sectoral Government Expenditure			
Agriculture and Irrigation (AGRI)	*58303*	*31048*	*0.53*
Civil Administration (CIVIL)	*61799*	*19183*	*0.31*
Defence (DEFENCE)	*149268*	*47982*	*0.32*
Education (EDU)	*92709*	*32821*	*0.35*
Energy and Water Supply (ENERG)	*43142*	*16096*	*0.37*
Health (HEALTH)	*62115*	*30618*	*0.49*
Housing (HOUS)	*6027*	*2638*	*0.44*
Interest Payments (INT)	*245773*	*89201*	*0.36*
Welfare Payments (WEL)	*129988*	*39769*	*0.31*
Transport and Communication (TRANS)	*101626*	*58820*	*0.58*
Other	*37738*	*15286*	*0.41*

If some or all of the variables are non-stationary in their level form, then the least squares estimation results using a regression model involving these variables may be spurious. However, even if the variables in the regression model are integrated of order 1, that is I(1), and are co-integrated, then the least squares estimation results may still be valid. Tables 3a and 3b present the unit-root test results for all the variables of interest. As can be seen, all the variables are stationary in their first difference at 1% level of significance. That is, all are I(1).

Based on a review of the literature (for example, see Devarajan *et al.* 1996; Gemmell *et. al* 2014), we consider the following six models for estimation. We have also included a "WAR" dummy variable to capture the effect of the civil war which commenced in 1983 and concluded in 2009 with a temporary cessation of hostilities during peace talks in 2002 and 2003. This variable takes value 1 during war years (1985-2001, 2004-2009) and 0 for non-war years (2002-2003 and 2010-2016). In Model 1, we use Total Government Expenditure (TGE) as the independent variable and in Model 2 we include TGE and the WAR dummy variable. In Model 3, we use Total Capital Expenditure (TCE) and Total Recurrent Expenditure (TRE) as independent variables and in Model 4, we add the WAR additional term. Lastly, in Models 5 and 6 we considered all sectoral variables with and without the WAR

Table 3a: Unit root (Augmented D-F and KPSS) test results
(All variables are in Rs millions)

Unit root test:	Augmented DF Test, Ho: Series is non-stationary						KPSS Test, Ho: Series is stationary					
	Level form			First Difference			Level form			First Difference		
	Test Statistic	p-value	Conclusion	Test Statistic	p-value	Conclusion	Test statistic	Critical value	Conclusion	Test Staistic	Critical value	Conclusion
Real GDP	-2.35	0.398	Non-stationary	-4.61	0.0009	Stationary	0.177	0.146	Non-stationary	0.332	0.463	Stationary
Total Government Expenditure	-2.34	0.402	Non-stationary	-4.09	0.0038	Stationary	0.220	0.146	Non-stationary	0.416	0.463	Stationary
Total Capital Expenditure	-4.18	0.013	Non-stationary[1]	-5.16	0.0003	Stationary	0.103	0.146	Stationary	0.376	0.463	Stationary
Total Recurrent Expenditure	-1.99	0.584	Non-stationary	-6.58	0.0000	Stationary	0.188	0.146	Non-stationary	0.344	0.463	Stationary
Sectorwise Government Expenditure												
Agriculture and Irrigation (AGRI)	-2.44	0.355	Non-stationary	-4.24	0.0024	Stationary	0.194	0.146	Non-stationary	0.578	0.739	Stationary[1]
Civil Administration (CIVIL)	-2.95	0.161	Non-stationary	-6.26	0.0000	Stationary	0.131	0.119	Non-stationary	0.341	0.463	Stationary
Defence (DEFENCE)	-3.04	0.139	Non-stationary	-6.56	0.0000	Stationary	0.124	0.119	Non-stationary	0.162	0.463	Stationary
Education (EDU)	-2.55	0.302	Non-stationary	-5.66	0.0001	Stationary	0.185	0.146	Non-stationary	0.288	0.463	Stationary
Energy and Water Supply (ENERG)	-2.15	0.500	Non-stationary	-5.65	0.0001	Stationary	0.089	0.146	Stationary	0.179	0.463	Stationary
Health (HEALTH)	-3.63	0.045	Non-stationary[1]	-6.00	0.0000	Stationary	0.107	0.146	Stationary	0.247	0.463	Stationary
Housing (HOUS)	-3.86	0.026	Non-stationary[1]	-6.14	0.0000	Stationary	0.083	0.146	Stationary	0.046	0.463	Stationary
Transport & Communication (TRANS)	-2.60	0.281	Non-stationary	-8.41	0.0000	Stationary	0.169	0.146	Non-stationary	0.194	0.463	Stationary
Welfare Payments (WEL)	-2.87	0.183	Non-stationary	-5.55	0.0001	Stationary	0.098	0.146	Stationary	0.212	0.463	Stationary

Table 3b: Unit root (Augmented D-F and KPSS) test results

Unit root test:	Augmented DF Test, Ho: Series is non-stationary						KPSS Test, Ho: Series is stationary					
	Level form			First Difference			Level form			First Difference		
Variable	Test Statistic	p-value	Conclusion	Test Statistic	p-value	Conclusion	Test statistic	Critical value	Conclusion	Test Staistic	Critical value	Conclusion
Real GDP growth rate	-4.91	0.002	Stationary	-6.86	0.0000	Stationary	0.090	0.146	Stationary	0.307	0.463	Stationary
Total Government Expenditure (% of GDP)	-2.38	0.382	Non-stationary	-4.32	0.0023	Stationary	0.220	0.146	Non-stationary	0.500	0.463	Stationary
Total Capital Expenditure (% of TGE)	-2.82	0.202	Non-stationary	-6.56	0.0000	Stationary	0.177	0.146	Non-stationary	0.406	0.463	Stationary
Total Recurrent Expenditure (% of TGE)	-2.82	0.202	Non-stationary	-6.56	0.0000	Stationary	0.177	0.146	Non-stationary	0.406	0.463	Stationary
Sectorwise Government Expenditure (% of TCE)												
Agriculture and Irrigation (AGRI)	-7.64	0.000	Stationary	-3.78	0.0079	Stationary	0.197	0.216	Stationary	0.511	0.739	Stationary[1]
Civil Administration (CIVIL)	-4.17	0.016	Non-stationary[1]	-5.38	0.0001	Stationary	0.109	0.119	Stationary	0.500	0.739	Stationary[1]
Defence (DEFENCE)	-2.52	0.318	Non-stationary	-7.02	0.0000	Stationary	0.152	0.146	Non-stationary	0.264	0.463	Stationary
Education (EDU)	-3.66	0.041	Non-stationary[1]	-6.61	0.0000	Stationary	0.063	0.146	Stationary	0.148	0.463	Stationary
Energy and Water Supply (ENERG)	-1.98	0.589	Non-stationary	-5.31	0.0002	Stationary	0.096	0.146	Stationary	0.128	0.463	Stationary
Health (HEALTH)	-2.83	0.200	Non-stationary	-6.12	0.0000	Stationary	0.059	0.146	Stationary	0.057	0.463	Stationary
Housing (HOUS)	-4.26	0.011	Non-stationary[1]	-8.16	0.0000	Stationary	0.075	0.146	Stationary	0.029	0.463	Stationary
Transport & Communication (TRANS)	-3.37	0.074	Non-stationary[1]	-7.43	0.0000	Stationary	0.154	0.216	Stationary	0.248	0.463	Stationary
Welfare Payments (WEL)	-2.68	0.251	Non-stationary	-4.69	0.0008	Stationary	0.130	0.146	Stationary	0.167	0.463	Stationary

[1] Conclusion at the 1% level.

* For the KPSS test, when variables are in level form, the critical values are: 10 percent = 0.119; 5 percent = 0.146; 1 percent = 0.216. When variables are in first differenced for, the critical values are: 10 percent = 0.347; 5 percent = 0.463; 1 percent = 0.739.

variable as independent variables and use the step-wise regression method to select the preferred variables.[3] We discuss below, the selection of the dependent and independent variables of the model.

Model 1: $RGDP = \alpha + \beta\ TGE + \varepsilon$

Model 2: $RGDP = \alpha + \beta\ TGE + \delta\ WAR + \varepsilon$

Model 3: $RGDP = \alpha + \beta_1\ TCE + \beta_2\ TRE + \varepsilon$

Model 4: $RGDP = \alpha + \beta_1\ TCE + \beta_2\ TRE + \delta\ WAR + \varepsilon$

Model 5: $RGDP = \alpha + \beta_1\ AGRI + \beta_2\ DEFENCE + \beta_3\ EDU + \beta_4\ HEALTH + \beta_5\ TRANS + \varepsilon$

Model 6: $RGDP = \alpha + \beta_1\ AGRI + \beta_2\ DEFENCE + \beta_3\ EDU + \beta_4\ HEALTH + \beta_5\ TRANS + \delta\ WAR + \varepsilon$

The model variables which have been used in the literature can be divided into three groups:

Group 1: *Dependent variable* is natural logarithm of Real GDP and *independent variables* are also the natural logarithm of real expenditures (for example, see Ansari *et al*., 1997, Kolluri *et al*., 2000; Loizides and Vamvoukas, 2005; Musaba *et al*, 2013; Ridzuan *et al*., 2014; Anthony *et al.*, 2016).

Group 2: *Dependent variable* is per capita real GDP growth rate and *independent variables* are the natural logarithm of real expenditures (for example, see Ravinthirakumaran and Kesavarajah, 2011; Anthony *et al*., 2016); and

Group 3: *Dependent variable* is per capita real GDP growth rate and *independent variables* are real expenditures as a proportion of total real government expenditure (for example, see Devarajan *et al*., 1996; Ranasinghe and Ichihashi, 2014; Gemmell *et al*., 2014).

We convert our data into the above three forms for estimation and present three sets of estimation results for the six models.

In Tables 3a and 3b, all the time series variables of interest were found to be I(1). To make the estimated regression results meaningful, the variables used in each model must be cointegrated. We perform Engle-Granger two step cointegration test for cointegration with the residuals of each model. Table 4 presents the results of the cointegration test of the six regression model variables. As can be seen, all the variables we have used for the final estimation are cointegrated. Therefore, our estimation results can be considered valid.

[3] Based on the stepwise regression results, the variables welfare payments (WEL), civil administration (CIVIL), energy and water supply (ENERG) and housing (HOUS) are not used in our models.

Table 4: Cointegration (Granger) test results

Cointegration test:	Group 1 variables			Group 2 variables			Group 3 variables		
Stationarity of the residuals	Test Statistic	p-value	Conclusion	Test Statistic	p-value	Conclusion	Test Statistic	p-value	Conclusion
Model 1	-2.91	0.056	Cointegrated*	-4.72	0.001	Cointegrated	-5.41	0.000	Cointegrated
Model 2	-2.75	0.077	Cointegrated*	-4.39	0.002	Cointegrated	-5.30	0.000	Cointegrated
Model 3	-4.29	0.002	Cointegrated	-5.11	0.000	Cointegrated	-4.80	0.001	Cointegrated
Model 4	-4.21	0.003	Cointegrated	-4.78	0.001	Cointegrated	-4.68	0.001	Cointegrated
Model 5	-3.75	0.008	Cointegrated	-5.85	0.000	Cointegrated	-5.42	0.000	Cointegrated
Model 6	-4.43	0.007	Cointegrated	-5.57	0.000	Cointegrated	-5.06	0.000	Cointegrated

* Significant at the 10% level. All others are significant at the 1 percent level.

5. Estimation results

Models with Group 1 variables:

As all the numerical variables in Group 1 are in logarithmic form, the coefficient estimate of each variable in the model can be interpreted as the corresponding elasticity. Table 5a presents the estimation results for the Group 1 variables. The standard errors of the parameter estimates and the corresponding *p*-values for the test of statistical significance of the coefficients are given in parentheses.

Consider model 1, where GDP is a function of total government expenditure (both variables are in natural logarithm), and model 2 where the WAR dummy is also included in model 1 to capture any change in the GDP due to the war:

Model 1: $LRGDP = \alpha + \beta\ LTGE + \varepsilon$

Model 2: $LRGDP = \alpha + \beta\ LTGE + \delta\ WAR + \varepsilon$

Columns 1 and 2 of Table 5a present the estimation results for the parameters in Models 1 and 2, respectively. As can be seen, the estimated effect of total government expenditure in both columns are positive and statistically significant, indicating that government expenditure plays a positive and significant role in improving the level of GDP. For example, the coefficient in column 1, 1.649, means that when total government expenditure increases by 10 per cent, real GDP would increase by 16.49 per cent. The war dummy variable, as expected, has a negative sign but is statistically insignificant. This means that, on average, the level of GDP during the war years has been lower compared to the non-war years, but the difference is not statistically significant.

Now we consider model 3, where GDP is considered as a function of total capital expenditure and total recurrent expenditure (all variables are in natural logarithm), and model 4 where the WAR dummy is also included:

Model 3: $LRGDP = \alpha + \beta_1\ LTCE + \beta_2\ LTRE + \varepsilon$

Model 4: $LRGDP = \alpha + \beta_1\ LTCE + \beta_2\ LTRE + \delta\ WAR + \varepsilon$

Columns 3 and 4 of Table 5a present the estimation results for the model 3 and 4 parameters, respectively. As can be seen, coefficient estimates of total capital expenditure and total recurrent expenditure are positive and statistically significant for both models. This indicates that both total capital expenditure and total recurrent expenditure play a positive and significant role in improving the level of GDP. For example, the coefficients in column 3 (1.384 and 0.158) indicate that when government capital expenditure increases by 10 per cent, real GDP would increase by 13.84 per cent and when government recurrent expenditure increases by 10 per

cent, GDP would increase by only 1.58 per cent. The war dummy variable, as expected, has a negative sign but is statistically insignificant. This means that on average, the war has reduced the level of GDP during the war years compared to the non-war years although not significantly. Finally, we consider model 5, where GDP is considered as a function of the sector-wise expenditures (all in log form), and model 6 where the WAR dummy is included:

Model 5: $LRGDP = \alpha + \beta_1 LAGRI + \beta_2 LDEFENCE + \beta_3 LEDU + \beta_4 LHEALTH + \beta_5 LTRANS + \varepsilon$

Model 6: $LRGDP = \alpha + \beta_1 LAGRI + \beta_2 LDEFENCE + \beta_3 LEDU + \beta_4 LHEALTH + \beta_5 LTRANS + \delta WAR + \varepsilon$

We used the stepwise regression procedure to select the most significant variables among the nine sector variables listed in Table 3a and found agriculture and irrigation, defense, education, health, and transport and communication are the most important variables among the nine variables we considered in our analysis. We estimate models 5 and 6 with these variables. As can be seen from columns 5 and 6 of Table 5a, defense, health, and transport and communication expenditure coefficients are positive and statistically significant, meaning that they have a positive influence on GDP. On the other hand, education expenditure makes a positive contribution to GDP but is statistically insignificant. The effect of the government expenditure on the agriculture and irrigation sector on GDP is negative and statistically insignificant at the 5 percent level of significance. The estimated coefficients presented in the last

Table 5a: Model estimation results, Group 1 variables, Sri Lanka

Dependent Variable: Real GDP

Independent Variables		Model 1 (1)	Model 2 (2)	Model 3 (3)	Model 4 (4)	Model 5 (5)	Model 6 (6)
Intercept		**-7.653**	**-6.762**	**-5.541**	**-4.531**	**3.087**	**3.982**
	Standard error	(1.069)	(1.543)	(.785)	(1.091)	(1.423)	(1.281)
	p-value	(.000)	(.000)	(.000)	(.000)	(.039)	(.005)
Total Government Expenditure (TGE)		**1.649**	**1.587**				
	Standard error	(.078)	(.110)				
	p-value	(.000)	(.000)				
Total Capital Expenditure (TCE)				**1.384**	**1.332**		
	Standard error			(.064)	(.075)		
	p-value			(.000)	(.000)		
Total Recurrent Expenditure (TRE)				**0.158**	**0.138**		
	Standard error			(.068)	(.069)		
	p-value			(.027)	(.055)		
Agriculture and Irrigation Expenditure (AGRI)						**-0.145**	**-0.123**
	Standard error					(.074)	(.065)
	p-value					(.061)	(.070)
Defence Expenditure (DEFENCE)						0.165	**0.219**
	Standard error					(.128)	(.114)
	p-value					(.209)	(.065)
Education Expenditure (EDU)						0.160	0.165
	Standard error					(.266)	(.233)
	p-value					(.553)	(.485)
Health Expenditure (HEALTH)						**0.634**	**0.545**
	Standard error					(.193)	(.172)
	p-value					(.003)	(.004)
Transport & Communication (TRANS)						**0.247**	**0.182**
	Standard error					(.083)	(.076)
	p-value					(.006)	(.024)
WAR			-0.056		-0.069		**-0.162**
	Standard error		(.070)		(.052)		(.054)
	p-value		(.427)		(.199)		(.006)
Adusted R^2		0.935	0.935	0.962	0.963	0.947	0.959
F-test (p-value)		0.000	0.000	0.000	0.000	0.000	0.000

Note: Estimates in bold are significant at the 5 or 10 per cent level. Standard errors and *p*-values are in parentheses.

column of Table 5a indicate that, for example, when expenditure on defence increases by 10 per cent and when other variables are held constant, on average, GDP will increase by 2.19 per cent, , education will increase by 1.65 per cent, health will increase by 5.45 per cent and transport and communication will increase by 1.82 per cent. A 10 per cent increase in government expenditure on the agriculture and irrigation sector would reduce GDP by 1.23 per cent.

Models with Group 2 variables:

Now we consider the same six models but with dependent variable as per capita real GDP growth rate and the independent variables in natural logarithm of real expenditures (in Rs millions) as defined in Group 2. Table 5b presents the estimation results for the six models. As can be seen from columns 2 and 3, as in Table 5b, the total government expenditure positively influences economic growth. Among the two levels of government expenditures (columns 3 and 4), total capital expenditure has a positive effect on the economic growth, while total recurrent expenditure has a negative effect on economic growth. Among the sectoral variables (columns 5 and 6), education, and transport and communication have a positive effect on economic growth, while agriculture and defence both have a negative effect. In all models with the WAR dummy, results show that during the war years economic growth seems to be lower than that during the non-war years. A point worth noting is that the statistical significance of the estimated coefficients of all the models in Table 5b are not as good as those in Table 5a.

Models with Group 3 variables:

Table 5c presents the estimation results for the six models with variables defined as in Group 3. The dependent variable is the per capita real GDP growth rate while the independent variables are the expenditures shares. As can be seen in columns 1 and 2, in contrast to the Groups 1 and 2 results, total government expenditure negatively influences the economic growth rate. Among the two levels of government expenditures, the total capital expenditure has a positive effect on economic growth as in Groups 1 and 2 (see columns 3 and 4 of Tables 5a and 5b). Among the sectoral variables, while defence, education, and transport and communication have a positive effect on economic growth (as in Table 5a), agriculture and irrigation have a negative effect. In all models, war has a negative impact on economic growth.

Table 5b: Model estimation results, Group 2 variables, Sri Lanka

Dependent Variable: Real per capita GDP growth rate

Independent Variables		Model 1 (1)	Model 2 (2)	Model 3 (3)	Model 4 (4)	Model 5 (5)	Model 6 (6)
Intercept		-31.964	-12.623	-27.605	-10.890	-3.823	2.632
	Standard error	(19.625)	(28.008)	(18.386)	(25.921)	(20.278)	(22.438)
	p-value	(.114)	(.656)	(.144)	(0.678)	(.852)	(.908)
Total Government Expenditure (TGE)		**2.640**	1.298				
	Standard error	(1.425)	(1.989)				
	p-value	(.074)	(.519)				
Total Capital Expenditure (TCE)				**3.550**	2.658		
	Standard error			(1.634)	(1.906)		
	p-value			(.039)	(0.175)		
Total Recurrent Expenditure (TRE)				-1.271	-1.586		
	Standard error			(1.653)	(1.693)		
	p-value			(.448)	(.357)		
Agriculture and Irrigation Expenditure (AGRI)						**-3.262**	**-3.096**
	Standard error					(1.62)	(1.653)
	p-value					(.055)	(.073)
Defence Expenditure (DEFENCE)						-2.327	-2.106
	Standard error					(2.352)	(2.396)
	p-value					(.332)	(.388)
Education Expenditure (EDU)						**4.327**	3.801
	Standard error					(2.466)	(2.6)
	p-value					(.091)	(.156)
Health Expenditure (HEALTH)							
	Standard error						
	p-value						
Transport & Communication (TRANS)						1.917	1.538
	Standard error					(1.626)	(1.728)
	p-value					(.249)	(.382)
WAR			-1.214		-1.126		-0.811
	Standard error		(1.253)		(1.227)		(1.153)
	p-value		(.341)		(.367)		(.488)
Adusted R^2		0.110	0.073	0.100	0.094	0.178	0.161
F-test (p-value)		**0.074**	0.132	**0.089**	0.132	**0.058**	**0.092**

Note: Estimates in bold are significant at the 5 or 10 per cent level. Standard errors and *p*-values are in parentheses.

Table 5c: Model estimation results, Group 3 variables, Sri Lanka

Dependent Variable: Per capita real GDP growth rate

Independent Variables		Model 1 (1)	Model 2 (2)	Model 3 (3)	Model 4 (4)	Model 5 (5)	Model 6 (6)
Intercept		**9.856**	**9.789**	-5.434	-2.721	-5.463	-5.301
	Standard error	(1.718)	(1.839)	(5.515)	(5.543)	(6.022)	(6.023)
	p-value	(.000)	(.000)	(.333)	(.627)	(.373)	(.387)
Total Government Expenditure (TGE)		**-0.194**	**-0.182**				
	Standard error	(.059)	(.076)				
	p-value	(.003)	(.024)				
Total Capital Expenditure (TCE)				**0.133**	0.112		
	Standard error			(.075)	(.073)		
	p-value			(.085)	(0.139)		
Total Recurrent Expenditure (TRE)							
	Standard error						
	p-value						
Agriculture and Irrigation Expenditure (AGRI)						**-0.302**	-0.216
	Standard error					(.144)	(.168)
	p-value					(.046)	(.208)
Defence Expenditure (DEFENCE)						0.025	0.085
	Standard error					(.164)	(.175)
	p-value					(.878)	(.631)
Education Expenditure (EDU)						**0.861**	**0.864**
	Standard error					(.423)	(.424)
	p-value					(.053)	(.052)
Health Expenditure (HEALTH)							
	Standard error						
	p-value						
Transport & Communication (TRANS)						**0.316**	0.232
	Standard error					(.141)	(.164)
	p-value					(.033)	(.169)
WAR			-0.266		**-1.556**		-1.089
	Standard error		(1.041)		(.882)		(1.084)
	p-value		(.801)		(.089)		(.325)
Adusted R^2		0.268	0.218	0.100	0.131	0.214	0.215
F-test (p-value)		**0.003**	**0.012**	**0.085**	**0.053**	**0.035**	**0.048**

* TCE and TRE are proportions of TGE. The sectoral expenditures are proportions of TCE.
Note: Estimates in bold are significant at the 5 or 10 per cent level. Standard errors and *p*-values are in parentheses.

6. Conclusion

In this paper, we investigated the impact of total government expenditure on economic growth in Sri Lanka during the years 1985-2016in addition to the differential impacts of various sectoral government expenditures on economic growth in Sri Lanka during the same period. For this purpose, six different models at the aggregate and sectoral levels were specified taking the real GDP as well as the per capita real GDP growth rate, as the dependent variables. All models were estimated with and without a dummy variable to capture the effect of war on the economic growth in the country. The unit root test results indicated that all the variables used in this study are stationary in their first difference at the 1% level of significance. Engle-Granger cointegration test results revealed that all of the variables we used for the final estimation in each model are cointegrated.

Overall, our results are consistent across all model specifications, irrespective of the choice of the dependent variable. Our results indicate that real GDP (measured in both Rs million and per capita growth rate) and real government expenditure (measured in Rs million) have a positive and statistically significant relationship, suggesting that government expenditure plays a positive and significant role in improving the level of GDP. When modelling per capita real GDP growth rate and government expenditure shares, in contrast, the results show that a negative and statistically significant relationship exists between the GDP growth rate and government expenditure shares. In all models, GDP and GDP growth rates in Sri Lanka were both affected negatively during the war years. All estimated models indicated a positive and significant relationship between total capital expenditure and GDP (as well as GDP growth rate) indicating that capital expenditure plays a significant role in enhancing economic growth. This finding provides an important signal on redirecting government expenditure towards capital expenditure in the country.

At the sectoral level, as the step-wise regression picked the same independent variables, results are robust across all model specifications. Also at the sectoral level, expenditure on transport, and communication and education appear to have a positive impact on economic growth, while expenditure on agriculture and irrigation demonstrate a negative relationship in relation to economic growth. Expenditure on health also shows a positive effect on GDP. In comparison, expenditure on defence indicates mixed results, depending on the model specification. These findings, at the sectoral level, provide important insights for policy makers in the country to consider when allocating sectoral level government expenditure budget.

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