

GOVERNMENT FINANCES AND ECONOMIC GROWTH: A POLICY PERSPECTIVE ON THE DEVELOPING ECONOMY OF SRI LANKA

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In this paper, we analyse the fiscal policy orientation of the developing economy of Sri Lanka in the context of the growth performance of the economy during the period 1975-2000, using an integrated input-output and macroeconomic model. The paper draws upon the Government's policy approach towards faster economic growth. The empirical findings show that the Government's budget deficits are not primarily the result of an excess of consumption over revenue. Rather, other current expenses, such as Government transfers and interest payments, have been the main cause of the country's mounting public debt. The proportion of Government investment in total Government outlays has declined over time. This could be a major obstacle to economic growth. At the same time, the Government's recurring budget deficits have led to an escalating national debt, and the monetization of deficits has created inflationary pressures. In order to arrest these trends and encourage economic growth, reducing the current deficits in the Government budgets is imperative. Domestic private investment, foreign direct investment and Government investment have to be combined as complementary forces to ensure rapid economic growth in the country.

I. INTRODUCTION

Many developing countries have been interested in reducing Government activities in the realm of economics, consonant with encouragement to the private

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sector. In this paper, we have attempted to create a holistic picture of the overall fiscal scenario in one such developing economy, namely, Sri Lanka. The results obtained from the analysis of data on Government finances are then interpreted with the help of an integrated input-output and macroeconometric model developed for Sri Lanka, which is briefly outlined later in the paper.

Data from the Central Bank of Sri Lanka (2000-2006: 2006) reveal that the economy has been running fiscal deficits persistently. According to economic theory, fiscal deficits and Government debt squeeze out the growth potential of an economy (Abel and Bernanke 2001). This is not true of a demand-constrained economy. It also does not hold true when the Government runs a deficit to make investment expenditures, since investment leads to growth. In fact, modern growth theory encourages Government investment in the areas of infrastructure, education, health and similar areas (Abel and Bernanke 2001). In a developing economy that requires a high rate of growth, we should encourage both private investment and Government investment.

This paper is organized in four sections. Section II analyses the state of Government finances during the period 1975-2006. In section III, we present the integrated input-output and macroeconometric model developed in line with Keynes, Leontief and Klein to understand how the economy operates, and thereby be able to discuss the role of the Government in view of the integrated model. The estimated model is also presented in that section. Section IV contains some historical simulations that serve to highlight the possibilities of growth augmentation through appropriate economic policies. The summary and conclusions are presented in section V. Due to space considerations, a number of abbreviations and acronyms are used in the figures and tables; a complete list can be found immediately following the body of the paper.

II. GOVERNMENT FINANCES DURING THE PERIOD 1975-2006

In this section, we have analysed data on Government finances from the Government's policy document *Regaining Sri Lanka* (Sri Lanka 2002), the annual reports of the Central Bank of Sri Lanka (2000-2006) and United Nations National Income Statistics, for the period 1975-2000.

The Government's view on its finances and the public debt

In its policy document *Regaining Sri Lanka* (Sri Lanka 2002), the Government noted that a country that could not control its finances could not control its

economic future. It expressed concern over the way the Government debt had expanded dramatically, to the point where, at the time the document came out, the size of the public debt was larger than the country's gross domestic product (GDP). As a result, large budget deficits are incurred in order to service past interest obligations and to meet the essential day-to-day responsibilities of the Government. To put this in some perspective, the total public debt at that time translated to 77,500 Sri Lankan rupees (SL Rs) at current prices for every person in the country. The additional borrowing required to meet the deficit in the year 2002 added approximately SL Rs 6,000 to this burden. Also noted in the document was that if the large deficits continued unabated, public debt would grow faster than the economy. Ultimately, the reputation of the country regarding its creditworthiness would be damaged to the point where the economy would be unable to recover.

The Government, in the same document, stated that meeting the challenge of bringing the public debt under control required decisive action in two areas. The first objective was to create an environment where national income grew faster than the public debt, permitting the country to "outgrow" the debt burden. The second objective was to reduce the budget deficit to slow and eventually reverse the increases in public debt. This would entail both reducing public expenditures as well as increasing revenues. These adjustments were unavoidable and would have to be well managed to ensure that the burdens were shared fairly and did not impose an excessive burden on the most vulnerable members of society. It was also essential that the reforms be carried out in ways that did not limit the prospects for increased economic growth.

The Government's view rightly expressed concern over the current deficit rather than the overall deficit, because capital expenditures by the Government in the form of building infrastructure or through similar activities enhances the future growth potential rather than reducing it. However, in the context of public debt, there is a basic distinction between internal and external debt. An internal debt is like redistribution from one section of the society to another. As such, it entails no net burden, if we put debtors and creditors on the same footing. An external debt, on the other hand, is definitely a net burden to the national economy and has a bearing on its creditworthiness as perceived by international donors.

An increase in Government budget deficit adds to the existing public debt. If the Government raises tax rates in the future to retire this debt, there may be associated inefficiencies. In *Regaining Sri Lanka* (Sri Lanka 2002), the Government therefore proposed building a "world-class Revenue Authority" that incorporated transparency, simple mechanisms and low-to-moderate tax-rates. On the issue of curbing its current outlays, one had to be certain that the wasteful expenditures—not

the healthy branches of Government outlays—were pruned. A developing economy trying to restructure its fiscal stance should be careful not to bring down Government purchases of goods and services to the point of creating aggregate demand deficiency or to reduce Government investment in order to achieve a given target ratio of fiscal deficit to GDP.

The current deficit in the Government budget

Data at current prices from the Central Bank of Sri Lanka (2000-2006) on the current expenditures of the Government show an annual exponential growth rate of 14.97 per cent during the period 1975-2000. There has been a marked slowdown in this growth rate since the year 2000. If we compute the annual exponential growth rate of the current expenditures of the Government from 1975 to 2000, we find that it is even higher—15.98 per cent. For the same time period, National Income Accounts Statistics current-price data from the United Nations (1975-2002) on Government consumption show an annual exponential growth rate of 17.24 per cent, while the current-price data from the Central Bank of Sri Lanka (2000-2006) on such expenditures show an annual exponential growth rate of 16.12 per cent. We found that, over time, the Government's current expenditures have increased significantly beyond Government consumption. The reason for this gap is the rise in welfare expenditures and interest payments on Government borrowings. Figures A.1 and A.2 in appendix I show the Government's current outlays and current deficit, respectively, for the period 1975-2000.

Data from the United Nations (1975-2002) and the Central Bank of Sri Lanka (2000-2006) on the Government's total tax and non-tax revenue match almost perfectly, year to year. The annual growth rate as shown by the Central Bank data is 14.99 per cent. Figure A.2 clearly shows that prior to 1988 (shown as time point 12), tax and non-tax revenue was more or less in line with current expenditures of Government, but since 1988 (the war period) the latter has overtaken the former and the gap is increasing. In fact, according to data from the Central Bank of Sri Lanka (2000-2006), the Government's total current expenses were about twice its purchases of goods and service during the years 1988-2000 (figure A.1).

The continuing internal ethnic conflict has put a heavy burden on the Government. Data from the Special Statistical Tables of the Central Bank of Sri Lanka (2000-2006: 2003, 2004) reveal that since 1984, defence expenditures as a percentage of the excess of current expenditures of Government over final consumption expenditures has been rising. Further data from the Central Bank show that defence expenditures as a proportion of the Government budget deficit have increased steadily, from 10 per cent to more than 46 per cent between 1988

and 2000 (table 1). Had peace prevailed, these resources could have been free for economic development and the pressure on the budget deficit and public debt would have been considerably less. As the Government noted in *Regaining Sri Lanka*, the peace initiative is vital for economic development.

Table 1. Defence expenditures of the Government

	<i>Defence expenditures (millions of Sri Lankan rupees)</i>	<i>Government budget deficit (millions of Sri Lankan rupees)</i>	<i>Defence expenditures/ Government budget deficit (percentage)</i>
1984	5 029	54 341	9.26
1985	18 098	74 467	24.30
1986	16 100	81 241	19.82
1987	20 587	74 613	27.59
1988	14 786	108 689	13.60
1989	11 437	79 146	14.45
1990	15 731	74 380	21.15
1991	21 826	93 482	23.35
1992	24 893	65 813	37.82
1993	27 121	76 229	35.58
1994	31 137	97 388	31.97
1995	51 641	98 663	52.34
1996	50 461	95 820	52.66
1997	45 062	85 183	52.90
1998	47 332	103 748	45.62
1999	42 867	89 065	48.13
2000	56 733	124 144	45.70

Source: Central Bank of Sri Lanka (2000-2006).

The current primary deficit

A study of the current primary deficit in the Government budget helps to analyse the feasibility of the Government's ongoing consumption plans. Figure A.3 in appendix I shows that total tax and non-tax revenue are in excess of Government consumption. However, these resources are inadequate when we include Government transfers and the legacy of obligations arising out of past programmes, such as interest on past debt. Hence, the series reflecting the current expenditures of the Government lies above the tax and non-tax revenue series in figure A.2, as noted above.

Unless the principals of past debts are retired, the legacy of interest payments will continue. Thus, when it comes to downsizing the total public debt, the Government is left with the options of curtailing its purchases, its transfers or its investment in order to reduce its total outlays. Government consumption is a component of aggregate demand in the economy. Reduction in this component will affect capacity utilization unless there is a matching increase in private sector consumption or investment or net exports. Although neoclassical economists claim that permanent reductions in Government purchases would lead to permanent increases in disposable income and stimulate private consumption, there is no concrete evidence of such forward-looking behaviour, even in developed economies such as the United States of America or in a developing Asian economy, such as India. It is natural to expect that, in a developing economy such as Sri Lanka, market imperfections would produce similar results. Government transfers are a politically sensitive issue. That leaves the third option, Government investment. This component of public expenditure does not come within the ambit of discussions of current primary deficit. It is a part of the total purchases of goods and services by the Government and hence may be discussed in the context of the overall budget deficit and the resulting public debt. Annual reports (2002 and 2003) of the Central Bank of Sri Lanka have in fact mentioned that cutting down Government investment is not advisable, even if the economy suffers from high overall public debt. The next subsection discusses the issue of public investment expenditure.

Before that, let us look at the possibilities of increasing Government revenue. In *Regaining Sri Lanka*, the Government had projected an arrest and, ultimately, reversal of the trend of the growing budget deficit. Figures A.4 and A.5 in appendix I show two scenarios for the current deficit in the years 2000-2006, based on the ongoing trend in the economy and under the Government's policy programme. However, on comparing the Government's total tax and non-tax revenue collections under the two alternative scenarios—continuing with the past trend and implementing the Government's policy, we find that the total revenue collections do not differ much between the two scenarios. Figure A.6 in appendix I summarizes the relevant data. Therefore, the trend reversal in the current account of the Government's budget proposed in the policy document is actually due to the reduction in current outlay of the Government.

It is obvious that, despite the Government's intentions of creating a "world-class Revenue Authority", there is little scope for any substantive improvement in its revenue collection. The Government's action plan shows a trend reversal by 2004 in figure A.5. Its plan to halt and ultimately reverse the ongoing trend of the budget deficit (as shown in figures A.4 and A.5 in appendix I) is therefore conditional on cutting its outlays rather than on augmenting its resources.

Analysing data from the policy document *Regaining Sri Lanka*, we find that the Government's fiscal correction policy actually proposed drastic cuts in the total current expenses, ranging from 17.22 per cent to 47.34 per cent between 2000 and 2006. Table 2 shows the relevant figures.

Table 2. Current expenditures of the Government

Year	Level of current expenditures (millions of Sri Lankan rupees)		Percentage reduction
	Past trend	Government policy	
2000	254 279	254 279	–
2001	362 528	300 100	17.22
2002	425 362	330 100	22.40
2003	499 086	344 600	30.95
2004	585 589	367 700	37.21
2005	687 084	391 600	43.01
2006	806 171	424 500	47.34

Sources: Central Bank of Sri Lanka (2000-2006) and Sri Lanka (2002).

The trend of Government capital expenditures

We have taken data from Central Bank annual reports (2000-2006) to compute the ratio of Government investment (IG) to: (a) the excess of total tax and non-tax revenue (TR) over final consumption expenditures (CG), that is: $IG/(TR-CG)$; and (b) the budget deficit, that is IG/BD .

Let us begin with the first ratio. As noted above, the Government's total tax and non-tax revenues have been in excess of Government consumption. The ratio $IG/(TR-CG)$ gives an indication of the relative importance of Government investment expenditures in the Government budget. The current primary surplus (TR-CG) also measures the extent to which the Government can make transfers and interest payments without incurring current deficits in its budget. The ratio $IG/(TR-CG)$ has always remained below unit level and declined over the period 1975-2000. This indicates that the importance of Government investment was on the decline, relative to interest and transfer payments.

The second ratio (IG/BD) shows to what extent (in percentage terms) Government investment might have contributed to the budget deficit. Both ratios show a declining trend, indicating that the relative importance of Government investment in the Government budget was on the decline. Both ratios, however, stabilize at around 40 per cent towards the end of the period 1975-2000. The

analysis reinforces our earlier finding that the Government's transfers and interest payments, rather than its consumption and investment expenditures, are the main sources of the deficit that resulted in the escalation of public debt. Columns 2 and 3 of table 3 show the two ratios explained above.

Table 3. Government investment, Government budget deficit, and national debt ratios
(Percentage)

(1) Year	(2) IG/(TR-CG)	(3) IG/BD	(4) ND/GDPN	Growth rate of ND/GDPN	
				(5) Actual	(6) Estimated
1975	57.72	71.50	54.80	5.87	6.56
1976	72.48	67.63	58.47	6.69	7.61
1977	51.99	87.21	68.63	17.38	20.94
1978	35.62	45.38	72.54	5.71	6.69
1979	52.23	51.81	67.72	-6.66	-8.17
1980	77.54	37.02	77.18	13.98	17.75
1981	47.32	30.26	76.10	-1.40	-1.79
1982	62.05	28.57	81.15	6.64	7.75
1983	43.92	36.14	80.97	-0.23	-0.28
1984	31.70	50.92	68.51	-15.38	-19.45
1985	39.65	41.04	80.24	17.11	18.08
1986	52.53	44.88	86.76	8.13	8.98
1987	49.43	51.38	96.99	11.80	12.93
1988	65.95	37.73	101.02	4.15	4.69
1989	52.20	51.06	108.72	7.62	8.65
1990	34.64	39.76	96.58	-11.17	-14.27
1991	40.16	35.94	98.48	1.97	2.28
1992	30.53	40.19	95.36	-3.17	-3.62
1993	39.50	47.91	96.87	1.58	1.85
1994	32.68	29.08	95.14	-1.78	-2.07
1995	39.64	35.17	95.20	0.06	0.07
1996	36.02	32.47	93.26	-2.03	-2.33
1997	41.12	42.75	85.82	-7.98	-9.25
1998	45.17	36.51	90.84	5.84	6.68
1999	36.68	42.32	95.06	4.65	5.05
2000	52.03	33.04	96.90	1.94	2.21

Source: Compiled and estimated from the statistical tables in annual reports of the Central Bank of Sri Lanka (2000-2006).

Abbreviations: See list of abbreviations.

Column 4 of table 3 shows clearly that the national debt to nominal GDP ratio has indeed reached alarming proportions in Sri Lanka. In order to curb the public debt that has snowballed over time, there remains the soft option of taking up expenditure-trimming measures directed at its consumption and investment outlays of the Government. However, the *Annual Report* of the Central Bank of Sri Lanka (2003) noted the need for the Government to step up its investment expenditure for growth as well as development of the economy.

Government budget deficit and national debt

We define the national debt (ND) of any year as the sum of the previous year's national debt (ND_{-1}) and the budget deficit (BD) of the given year, ($ND = ND_{-1} + BD$). This definition generates data that tracks the actual data very closely. Columns (3), (4) and (5) of table 3 show the ratio of national debt to nominal gross domestic product, as well as the growth rate of the debt-to-GDP ratio. These help us analyse the sustainability of national debt in Sri Lanka.

We find that the debt-to-GDP ratio took a turn for the worse since the beginning of the ethnic war in the late 1980s. The debt-sustainability issue has to be discussed keeping in mind the Government's policy of reducing the current deficit. Any cut in the excess of current expenditures over Government final consumption expenditures, if feasible, may augment resources for investment by the Government, increasing the growth potential of the economy. To obtain a clear picture on this, we calculated the trend growth rate of current expenditures of the Government minus final consumption expenditures for the period 1975-2000 at constant prices of 2000. It turned out to be 5.07 per cent.

Possibility of resource augmentation

The Government policy document (Sri Lanka 2002) relied on the initiative of the private sector to increase investment and step up growth in the economy. As per the official policy, the role of the Government would be to create an environment conducive to private investment in the economy. Our purpose is to discover whether the Government can, in addition, generate resources for its own investment, which we believe will attract, support and supplement the proposed private investment in the economy. To this end, we carried out a simple exercise using data from the *Annual Report 2003* of the Central Bank of Sri Lanka. The results are presented in table 4.

As shown above, Government consumption purchases are well within the limits set by its total revenue collections. The budget deficits are mainly due to the excess of current expenses over its consumption purchases. This shows that

the Government's interest payments and transfers are the main reasons for the deficits. Containing the deficit therefore requires curtailment of this excess.

Data show that during the period 1975-2000, the actual growth rate of the excess of current expenses over consumption purchases (CEG-CG (old) in table 4), was 5.07 per cent per annum (based on estimates from table 4). For the Government to make resources available for investment leading to growth, it would have to divert expenditures from the pool of CEG-CG, given the limited possibility of increasing its total current revenues and its commitment to the consumption purchases. If it had been possible to halve the growth rate of CEG-CG, then the balance amount could have been directed towards investment. At no extra burden to the public debt, these resources could have been channeled towards Government investment in the economy.

We computed a new set of figures for the excess of current expenses over consumption purchases (CEG-CG (new) in table 4), at a growth rate of 2.53 per cent per annum, which is half the historic growth rate of 5.07 per cent per annum. The gap, calculated as CEG-CG (old – new), is a measure of the extent to which additional resources could have been generated for Government investment within the existing scenario of Government finances. The current deficit would be taken care of, and there would be no extra burden on the existing public debt. Moreover,

Table 4. Possibility of resource augmentation, 1988-2000

(Millions of Sri Lankan Rupees, at constant 2000 prices)

Year	CEG-CG (new)	CEG-CG (old)	Additional resources (old – new)
1988	73 687	74 626	939
1989	75 577	78 504	2 927
1990	77 516	82 584	5 068
1991	79 505	86 875	7 370
1992	81 544	91 390	9 845
1993	83 636	96 139	12 503
1994	85 782	101 135	15 353
1995	87 982	106 390	18 408
1996	90 240	111 919	21 679
1997	92 555	117 735	25 180
1998	94 929	123 853	28 924
1999	97 364	130 289	32 925
2000	99 862	137 060	37 198

Source: Compiled and estimated from data from the Central Bank of Sri Lanka (2000-2006: 2000).

Abbreviations: See list of abbreviations.

the additional growth resulting from Government investment would stand the economy in good stead as far as long-term possibilities of debt retirement are concerned.

Table 4 presents the results regarding the possibility of resource augmentation in the economy for Government investment. It appears that, from the year 1988 onwards, it would have been possible for the Government to augment resources for investment in the economy.

Main observations on Government finances

Above we analysed the nature of the problem of the Government budget deficit and the resulting public debt in the developing economy of Sri Lanka. The different categories of deficit reveal that the Government's tax and non-tax revenues are actually in excess of its current consumption of final goods and services. The current account of the budget has been running deficits due to the excess of current outlays of the government over tax and non-tax revenues. More specifically, the current expenditures are nearly twice those of final consumption. The difference between the two is attributable to interest payments on past debt and current transfers made by the Government. The Government's proposed reforms do not seem to make much of a difference in terms of increasing current revenues. The main thrust of the fiscal reforms is on reducing current expenditures by about 17 per cent to 47 per cent within a span of six years (as shown in table 2).

Reducing final consumption expenditures may not guarantee a matching increase in private final consumption, due to imperfections in the market. Government investment, which is crucial for growth, is on the decline as a proportion of the budget deficit. Government investment as a proportion of the excess of current revenue over current consumption is also on the decline. Under such circumstances, the Government should try to augment resources for public investment so that the private sector may feel encouraged to participate.

Linking the Government sector to the rest of the economy

In the analysis so far, we have made some conjectures about possible measures in the domain of fiscal policy that could promote economic growth in Sri Lanka. To arrive at more concrete and substantive policy perspectives, the Government sector must be linked with a suitable quantitative model for the economy. This would open up the possibility of empirically testing the possibility of furthering growth.

In the next section, we present a model developed for Sri Lanka, which provides an overview of the economy and facilitates an understanding of how the economy actually works. The estimated model will form the basis for analysing the Government's finances, as well as the role of the Government in promoting economic growth.

III. THE KEYNES-LEONTIEF-KLEIN MODEL FOR SRI LANKA

In order to analyse the performance of the economy in detail, with particular emphasis on the role of the Government, we have developed an integrated input-output and macroeconomic model for the Sri Lankan economy by synthesizing the ideas of Keynes (1936), Leontief (1951) and Klein (1965, 1978, 1986).

While Colombage (1992) and others (as reported by Dasanayake 2000) have constructed macroeconomic models of various hues for Sri Lanka, these models have not considered the details of the production structure of the economy. In fact, Klein (1965, 1978, 1986) emphasizes that the supply-side of the economy should also be taken into account in any macroeconomic model. The complete model in this paper consists of the macroeconomic sub-model outlined in

Table 5. The macroeconomic sub-model

<i>Equation or identity</i>	<i>Number</i>
1. $CP = f(GDPD, CP-1, RR)$	Equation (1)
2. $GDPD = GDP - GTR$	Identity (1)
3. $CG = f(CG-1, GR, FA, BCG)$	Equation (2)
4. $GR = GTR + GNTR$	Identity (2)
5. $GTR = f(GDP, IM)$	Equation (3)
6. $GNTR = f(GDP, GNTR-1)$	Equation (4)
7. $ID = f(GDP-1, BCP, BCG, FDI, RR)$	Equation (5)
8. $TI = ID + FDI$	Identity (3)
9. $GDP = (CP + CG) + TI + (EX-IM)$	Identity (4)
10. $EX = f(EXCH, GDPW)$	Equation (6)
11. $IM = f(EXCH, GDP)$	Equation (7)
12. $R = f(GDP, MS)$	Equation (8)
13. $CPI = f(MS)$	Equation (9)
14. $RR = R-INFL$	Identity (5)
15. $INFL = (CPI-CPI-1)/CPI-1$	Identity (6)

Notes: Exogenous variables: CP-1, CG-1, BCG, GNTR-1, GDP-1, FDI, GDPW, BCP, EXCH, MS.

Endogenous variables: CP, GDPD, CG, GR, GTR, GNTR, ID, TI, GDP, EX, IM, R, CPI, RR, INFL.

Abbreviations: See list of abbreviations.

table 5 and an input-output sub-model given by $x = Ax + f$, where x represents the vector of gross outputs, A is the technology matrix, and f stands for the vector of final demands.

Thus, we have a complete circuit: GDP→FINAL DEMANDS→SECTORAL PRODUCTION→VALUE ADDED→GDP. This approach provides substantial and detailed production-and-supply-side content to conventional macroeconometric models and remedies the short-circuit problem of conventional open static input-output models, where initial exogenous increases in final demand do not create subsequent rounds of income-induced, multiplier-led expansions of consumption and investment expenditures.

The input-output sub-model has 19 sectors based on a suitable aggregation scheme applied to the input-output tables of Sri Lanka for 1986, 1994 and 2000. The input-output tables have been sourced from the Ministry of Finance and Planning (Sri Lanka 1986, 1994) and the Institute of Policy Studies (Sri Lanka 2000).

Data for the macroeconometric model were sourced from various publications of the United Nations on national income statistics (United Nations 1975-2002). Detailed estimates of the behavioural relationships of various sectors of the input-output sub-model were obtained in order to supplement the macroeconomic estimates. For example, in the area of private consumption expenditure, individual functional forms were estimated for as many different sectors as permissible, given the data availability and compatibility constraints. These individual estimates were tied to the aggregate consumption function. Similarly, the total investment expenditure was divided into major categories, such as construction, and transport and machinery, and a similar detailed estimation procedure was repeated. The model focuses on capturing as many details as possible in the area of foreign trade by looking into commodity-level export-import data sourced from international trade statistics (United Nations 1975-2000).

The estimated macroeconometric model

Since our objective in this paper is to analyse Government finances, we present the estimated aggregate equations of the macroeconometric model only. The estimated results of that model, using the method of two-stage least squares, appear in appendix II. In the first-stage results of the estimation process, the Durbin-Watson statistics of the equations were statistically insignificant, implying the absence of a first-order autoregressive pattern in the disturbance terms of the individual equations. In a simultaneous equations system, the set of regressors is partly endogenous. Therefore, the conventional measures of R-squared may be misleading. Following Maddala (1988), we have used a measure of goodness of fit

denoted in table B.1 of appendix II by “R-squared”, given by the expression $[1 - (\text{Residual sum of squares} / \text{Total sum of squares})]$. Below, we discuss a few salient features of our estimated macromodel.

Private consumption. Initially, we tried to estimate private final consumption expenditure as a function of disposable real output, lagged consumption, and also the real rate of interest. The estimated regression coefficients for disposable real output and lagged consumption were both significant at the 5 per cent level. However, the estimated form omits the real rate of interest, because its coefficient was statistically insignificant. Our estimated results indicate that the inter-temporal substitution effect supposed to operate through the real rate of interest is weak in the Sri Lankan economy.

Government consumption. It is widely believed that uneconomic Government expenditure lies behind many of the problems of macroeconomic management in developing economies. In order to test this proposition, we investigated whether the Government actually consumes out of bank borrowings or accumulated foreign asset holdings of the Central Bank. The estimated coefficient of lagged Government consumption and that of Government revenue were both significant at 5 per cent, while the coefficients of bank credit to the Government and foreign direct investment (FDI) were statistically insignificant. Hence, these regressors were not included in the final estimates, where both the variables lagged Government consumption expenditure and Government revenue are significant at 1 per cent. The important result obtained in this context is that Government consumption was shown to be directed by Government revenue and dependent on its own lagged value.

Total investment. We began with the proposition that total investment has two components: domestic and foreign. It emerged that domestic investment was not operating under an accelerator-type of mechanism, because the coefficient of lagged GDP was statistically insignificant even at the 10 per cent level. The coefficients of the other regressors were also not statistically robust. Repeated trials brought out the estimated result that total investment depends on the volume of bank credit available to the private sector, bank credit to the Government, and FDI, each significant at the 5 per cent level. The real rate of interest, however, remains insignificant even at the 10 per cent level.

Government tax revenue. The estimated results show the coefficient of the real output GDP to be significant at the 1 per cent level, while the other explanatory variable, imports, was not found to be significant at either the 1 per cent or 5 per cent levels. Hence, the final estimate shows Government tax revenue to be a function of real GDP alone.

Government non-tax revenue. It was found that the lagged Government non-tax revenue and real GDP were the only explanatory variables that were statistically significant, at the 1 per cent and 10 per cent level, respectively.

Exports. Export demand for the country's products was not found to be dependent on real income of the world. The estimated form omits the income-effect supposed to be operating through world-GDP because its coefficient was statistically insignificant. The other explanatory variable—exchange-rate—was found to be significant even at the 1 per cent level. Hence, it appears that the exports of Sri Lanka are sensitive to relative price.

Nominal rate of interest. No statistically significant relationship was obtained between the nominal rate of interest and the GDP and money supply variables at the 5 per cent level of significance.

Money and prices. The estimated relationship was best obtained in a double-log form, indicating a relationship between the rate of growth of money supply and the rate of inflation. The coefficient of the nominal money supply was statistically significant even at the 1 per cent level.

Integrating the real and monetary sectors. In the macroeconomic sub-model, we wanted to take into account both real and monetary factors in the economy. The proposed integration was attempted through the real rate of interest, which in turn was modelled as the money rate of interest net of the inflation rate. However, neither the consumption nor investment functions estimated showed significant coefficients for the real rate of interest. Therefore, to incorporate monetary and fiscal policy in the model later on, we have used the already-introduced credit-channel variables, namely, bank credit to the private sector and bank credit to the Government.

The estimated model was solved for GDP in terms of the purely exogenous and predetermined (lagged) variables. Repeated substitutions of the functional forms of the variables lead to a convergence of the GDP values that are very close to the actual figures.

Discussions on the detailed regressions of the input-output sectors

As mentioned above, the estimated sector-level equations are presented in appendix II. We now discuss the main features of the estimated sector-level details.

Consumption. Four main categories were identified: (a) food, beverages and tobacco; (b) textiles, clothing and footwear; (c) electricity, water and gas; and

(d) other manufactured products. All four were found to be strongly related to disposable GDP alone. In each of these regressions, the estimated coefficients were significant at the 1 per cent or 5 per cent level.

Investment. The model identified two major categories of investment expenditure: (a) construction and land development; and (b) machinery and equipment manufacturing. In the construction sub-group, the coefficient of bank credit to the private sector was statistically significant at the 1 per cent level, while the coefficients of the other factors, such as bank credit to the Government or FDI, were not significant even at the 5 per cent level. The equation estimating investment in the category of machinery showed a negative coefficient of bank credit to the private sector. However, the estimated coefficients of bank credit to the Government as well as FDI were positive and statistically significant at the 1 per cent level. The final estimates show investment in machinery and equipment manufacturing to be a function of bank credit to the Government and FDI, with both the respective coefficients significant at the 1 per cent level.

Export. Traditional exports, such as tea and rubber, were not strongly related to exchange-rate variations or world-GDP fluctuations, as indicated by low values of R-squared. However, the coefficients of exchange rate were statistically significant at the 1 per cent or 5 per cent level. Some of the main categories of exports were identified as: (a) other agricultural products; (b) garments; (c) non-metallic products; (d) other manufactured products; and (e) machinery and equipment manufacturing. Of these, machinery and equipment manufacturing showed a double-log relationship with the exchange rate, while other manufactured products showed a double-log relationship with world-GDP. In each case, the coefficient of the regressor was found to be statistically significant at the 1 per cent level. It may be recalled that overall, the exports of Sri Lanka were not found to be sensitive to world-GDP, indicating that the relative importance of other manufactured products (which is sensitive to world-GDP) in total exports was low during the period 1975-2000.

Import details. The main categories of imports were identified as: (a) rubber; (b) other agricultural products; (c) textiles; (d) food processing; (e) chemicals and chemical products; (f) non-metal products; (g) other manufactured products; (h) machinery and equipment manufacturing; and (i) basic metals. The main factor affecting these imports was identified as GDP, since its coefficient was statistically significant at the 1 per cent level. However, in the case of rubber and the machinery and equipment sector, imports were also found to be related to total investment in the economy.

In order to test the validation of this model, the root mean square percentage errors for the six broad sectors of the economy were computed by comparing the aggregate and detailed sectorwise GDP estimates with the corresponding figures from the national income accounts of Sri Lanka. The results are shown in table 6.

Table 6. Values of root mean square percentage errors

<i>Broad sectors of the economy</i>	<i>RMSPE</i>
Agriculture, hunting, forestry and fishing	0.25
Mining and quarrying	1.44
Manufacturing	0.25
Electricity, gas and water	3.05
Construction	0.33
Trade transport and other services	0.11

Source: Results from the present study based on data from the United Nations (1975-2002).

Abbreviation: RMSPE, root mean square percentage error.

In order to develop an understanding of how the economy works and to find out specifically whether the Government can initiate any active policy measures to increase the output level of the economy, we carried out some historical simulations. In the next section we discuss the results of these simulation exercises.

IV. HISTORICAL SIMULATIONS

The next step in our empirical investigation is to carry out some simulation exercises to find out how the economic performance of Sri Lanka would have been affected under alternative policy regimes. The first wave of liberalization in 1977-1979 included: (a) significant trade liberalization; (b) a revamping of foreign investment approval and provision of new incentives for investors; (c) interest rate reform; (d) the opening up of the banking sector to foreign banks; (e) limits on public sector participation in the economy; and (f) exchange rate reforms (Athukorala 2000). We wanted to investigate whether the performance of the Sri Lankan economy could have been better during the period 1975-2000. Our macromodel identifies four major exogenous variables that could possibly affect the growth performance of the economy. These are: (a) bank credit to the private sector; (b) bank credit to the Government; (c) FDI; and (d) the exchange rate between the Sri Lankan rupee and the United States dollar.

Historical data on these four policy variables reveal that each has been following a rising trend with marked fluctuations. In simulating the performance of the economy, we have altered the values of these variables at selected points of time, as far as permissible within the broad limits of historical data, and checked the sensitivity of GDP to such changes.

A method similar to the iterative convergence-based estimation procedure has been used for simulating the GDP of the economy during the period 1975-2000. Starting from the estimated GDP for 1975, estimates of private final consumption, Government final consumption expenditures, total investment, exports and imports were obtained. These formed the predetermined variables for the following year. Using those and the exogenous variables as per proposed alterations, the same procedure was repeated to arrive at the GDP of 1977. In this manner, a simulated series was obtained for the entire period 1975-2000. The proposed values of the exogenous variables were experimentally determined after closely observing their actual behaviour.

The first series to be considered was bank credit to the private sector. This variable recorded negative growth rates during the years 1980, 1988, 1989 and 1996. The simulation process proposes altered values of these variables. The value of bank credit to the private sector for 1980 was considered to be a 3 per cent increase over the previous year, instead of a decrease of 18.7 per cent. To revive the economy, the value for the following year (1981) was also considered to increase at the same rate of 3 per cent. For each of the years between 1988 and 1992, it was proposed that bank credit to the private sector grow annually at 1 per cent. Finally, for the years 1996, 1997 and 1998, annual growth of such credit was set at 2 per cent. The proposed changes were well within the limits set by the actual growth rates experienced by the variable during the period 1975-2000.

Next, we turned our attention to the second variable (bank credit to the Government sector). Historically, this series shows nine years with negative growth rates: 1978, 1983, 1984, 1990 to 1994 and 1997. It was proposed that there be an annual growth rate of 1 per cent in the variable during 1978 and 1984 to 1986, and of 0.5 per cent for each year in the period 1990 to 2000. If it had been possible to implement the proposed changes, the time path of GDP would have been higher than the actual figures for the entire time span 1975-2000.

In addition, we included some minor proposed changes in the series for FDI. We considered a low annual growth rate of 0.25 per cent from 1980 onwards, except for 1997 and 1998, when the growth rates were higher. Finally, we considered changes in the exchange-rate depreciation for the years 1979, 1986, 1991 and 1995. Together, the proposed changes cause the simulated time-path of

GDP to be higher than the actual time-path. The average compounded annual growth rate of GDP could have been 5.42 per cent instead of the actually recorded 4.91 per cent for the entire time period 1975-2000, if it had been possible to implement these modest proposed changes.

Discussion on the results of the simulations

Growth prospects in the initial years of liberalization

During the early years (1976-1983), despite periodic declines, the actual average annual growth rates of bank credit to the private sector, bank credit to the Government sector and FDI in percentage terms were 13.74, 13.11 and 19.65, respectively. The corresponding growth rate in GDP was 5.49 per cent. We observed the economy to be most sensitive to changes in FDI. If, instead of the drastic fall in the FDI figures during the period 1976 to 1983, it had been possible to maintain even a slightly positive growth rate of 0.25 per cent, the economy could have been on a higher time-path of GDP, recording an impressive 7.81 per cent annual growth on average. The simulation results are not particularly sensitive to changes in the variables of bank credit to the private sector or bank credit to the Government sector during this subperiod.

Effect of Government intervention during the war

The actual average annual growth rate of GDP during the period 1984-1990 was 3.64 per cent. It would have been possible to step up that rate to 4.16 per cent under an alternative moderately improved scenario, if the growth rate of foreign assets had been maintained, (even at levels as low as 0.25 per cent per annum), the growth rate of bank credit to Government had been maintained at 1 per cent per annum during 1984-1987, and the historical figures for bank credit to Government had been maintained thereafter.

A more optimistic alternative scenario would consist of maintaining the 0.25 per cent growth rate in FDI while going for a 15 per cent growth rate in bank credit to Government. The average growth rate of GDP could then have risen to 5.09 per cent per annum

Growth possibilities in the post-war period

Here we compare the actual GDP with two alternative scenarios during the period 1991-2000. In the moderate-improvement scenario, changes in the bank credit to Government and FDI figures have been considered. However, more marked changes in the former raise the annual growth rate from 5.3 to 6.55 per

cent on average. A summary of the results of the actual and simulated growth performance of Sri Lanka from 1976 to 2000 is provided in part 1 of table 7.

Table 7 has three parts: (a) policy led by bank credit to the Government sector; (b) policy led by bank credit to the private sector; and (c) policy led by bank credit to the private sector as well as FDI. In the first part, the estimated model shows that bank credit to the Government sector can stimulate growth in the Sri Lankan economy through its impact on total investment. This can be explained as the positive impact of Government investment in the economy. Therefore, it would seem that bank credit to the Government sector could stimulate growth.

However, a word of caution is necessary at this stage. The developing economy of Sri Lanka is also plagued by inflation. The estimated macroeconomic model detailed in table B. 1 in appendix II shows, through equation (9) of table 5, that the rate of inflation in Sri Lanka is closely related to the rate of growth of money supply. Growth in money supply, in turn, can be explained in terms of monetization of the Government budget deficit through bank credit to the Government sector. Figure C.1 and equation (C.1) of appendix III show that the stock of national debt is defined as the sum of the past stock and the yearly Government budget deficit. In figure C.2 and equation (C.2) we show that the rate of growth of the monetary base of Sri Lanka is largely explained through changes in the national debt. Finally, figures C.3 and C.4, together with equations (C.3) and (C.4) show the close connection between the Government budget deficit and bank credit to the Government sector. In other words, a high rate of growth of bank credit consequent upon widening Government budget deficits has been a major source of increase in money supply, creating inflation. However, bank credit to the Government explains only a part of total investment in the economy, because such credit has been used mainly to finance current account deficits. Therefore, the costs and benefits need to be weighed.

Data on the Sri Lankan economy for the period 1975-2000 show that Government investment accounts for a small percentage of bank credit to the Government sector, supporting the observation that the bulk of such funds sourced by the Government goes towards meeting current expenses. Again, the current expenses of the Government are comprised partly by the Government's current purchase of goods and services and partly by other current expenses in the form of interest payments and transfers to the private sector. It has been shown in this paper that Government revenue adequately finances the Government's current purchase of goods and services. In addition, the ratio of Government investment to Government budget deficit is small.

Table 7. Summary of growth rates, 1975-2000
(Percentage)

		1975-1983	1984-1990	1991-2000	1975-2000
Policy led by bank credit to the Government sector					
BCP:	Actual	13.74	0.40	9.24	8.58
	Simulated	13.74	3.35	8.14	8.58
BCG:	Actual	13.11	9.32	2.61	5.02
	Simulated	14.80	15.00	15.00	14.94
FDI:	Actual	19.65	-14.95	25.82	4.82
	Simulated	24.51	0.25	1.41	7.25
EXCH:	Actual	15.83	7.86	6.96	9.59
	Simulated	15.83	7.86	6.87	9.59
GDP:	Actual	5.49	3.64	5.30	4.91
	Simulated	7.81	5.09	6.55	6.03
Policy led by bank credit to the private sector					
BCP:	Actual	13.74	0.40	9.24	8.58
	Simulated	16.19	15.00	15.00	15.35
BCG:	Actual	13.11	9.32	2.61	5.02
	Simulated	13.11	9.32	2.61	5.02
FDI:	Actual	19.65	-14.95	25.82	4.82
	Simulated	24.51	0.25	1.41	7.25
EXCH:	Actual	15.83	7.86	6.96	9.59
	Simulated	15.83	7.86	6.87	9.59
GDP:	Actual	5.49	3.64	5.30	4.91
	Simulated	7.95	6.07	7.39	6.96
Policy led by bank credit to the private sector and foreign direct investment					
BCP:	Actual	13.74	0.40	9.24	8.58
	Simulated	16.19	15.00	15.00	15.35
BCG:	Actual	13.11	9.32	2.61	5.02
	Simulated	13.11	9.32	2.61	5.02
FDI:	Actual	19.65	-14.95	25.82	4.82
	Simulated	27.85	5.00	5.00	11.21
EXCH:	Actual	15.83	7.86	6.96	9.59
	Simulated	15.83	7.86	6.87	9.59
GDP:	Actual	5.49	3.64	5.30	4.91
	Simulated	8.16	6.31	7.43	7.12

Source: Results from the present study, based on data from United Nations (1975-2000).

Abbreviations: See list of abbreviations.

Therefore, the Government's interest payments and transfers to the private sector can be singled out as the main reason for the growing budget deficit, leading to monetization through bank credit to the Government sector and inflation in the economy. Since bank credit to the Government as a policy variable favours investment in the country, the implication is that public investment should be stepped up, and not that credit should be indiscriminately increased to finance additional current expenses of the Government, creating additional current account deficits and inflation.

Among the three factors explaining investment in Sri Lanka, the coefficients of bank credit to the private sector, as well as FDI, show a much larger impact on total investment compared with bank credit to the Government sector. These results are shown in table 7. For each of the three periods, the rate of GDP growth is highest under the policy led by bank credit to the private sector and FDI, followed by policy led by bank credit to the private sector, and least under a policy led by bank credit to the Government. Thus, the present paper in no way serves as a critique of growth led by the private sector.

The major conclusion that we reached is that private-sector investment, through bank credit to the private sector and FDI, and Government investment through bank credit to the Government sector, are complementary. The proposal for resource augmentation in no way requires additional funds in the form of bank credit to the Government. Rather, the resource augmentation proposal focuses on curbing the other current expenditures of the Government to accommodate Government investment. In this way, the public sector investment programmes could be financed in a non-inflationary manner.

V. SUMMARY AND CONCLUSIONS

In the present paper, we have analysed the twin problems of Government budget deficits and mounting public debt in Sri Lanka in the context of economic growth. While analysing the data on the Government budgets from 1975 to 2000, the authors found a current primary surplus throughout. The Government's current purchases of goods and services have not exceeded its total tax and non-tax collections. However, the total current expenditures of the Government have fallen short of the tax and non-tax revenues. The ratio of Government investment expenditures to the budget deficit has also been low. This leads the authors to conclude that the Government's transfer payments and its interest payments on past debt have been the two main reasons for the cumulating budget deficits, resulting in the snowballing public debt in the economy. The continuing internal ethnic conflict has also put a heavy burden on the Government.

In order to reverse this trend, the Government's policy document *Regaining Sri Lanka* (Sri Lanka, 2002) proposed a two-pronged action plan consisting of reductions in the Government's expenditures as well as increased revenue through a "world-class Revenue Authority". The authors find that the past trend of the Government's total tax and non-tax revenues is close to the projections of revenues made in the policy document, under the proposed revenue system. Therefore, the only two areas where the Government really has space to manoeuvre are its transfer payments in the form of social welfare programmes and attempts to retire past debts.

The present study has quantified the extent to which it would be possible for the Government to augment resources by curtailing such welfare expenditures as mentioned above. Table 4 showed the extent of real resource augmentation that would have been possible after the year 1988, if the growth rate of the current expenditures of the Government-Government consumption expenditures series had been reduced to 2.5 per cent per annum (half the actual rate). Those additional real resources could therefore have augmented Government investment in areas where private investment is slow to venture. In this way, the current deficit of the Government could have been reduced and an increase in Government investment could have stimulated growth.

An outline of the integrated macroeconometric and input-output model developed for the Sri Lankan economy shows clearly, through historical simulations, that Government investment could play a significant role in accelerating economic growth in Sri Lanka. Simulation exercises based on the macroeconometric model also highlight the potential of private investment and FDI in generating economic growth.

However, increasing Government investment and bank credit to the Government are not synonymous. The study indicates that the latter has largely been used to bridge the Government budget deficit that arose from the excess of current expenditures over revenues. Increases in bank credit to the Government have caused the monetary base to expand rapidly, creating high inflation in Sri Lanka. A high rate of inflation begets a high expected rate of inflation. Such inflationary expectations could erode the growth potential of the economy through its adverse impact on the supply side. Thus, while the role of Government investment in the economy is crucial, it is equally important to understand that bank credit to the Government may not be the best way to increase Government investment.

Hence, the authors conclude that the growth rate of the GDP of Sri Lanka can be substantially increased by encouraging market-based private-sector participation, and by systematically reducing the current deficits in the Government budget to release resources for investment. In following this policy, the Government has to provide a strong positive and credible signal to the private sector by reducing its current primary deficits, curbing current account expenditures and focusing on investment. The present paper therefore emphasizes a policy of augmenting growth by promoting the complementary roles of Government and private investment, both domestic and foreign.

ABBREVIATIONS

BCG	Bank credit to the Government sector
BCGEST	Estimated bank credit to the Government sector
BCP	Bank credit to the private sector
BD	Budget deficit
CEG	Current expenditures of the Government sector
CG	Government consumption expenditure
CG ₋₁	Lagged Government consumption expenditure
CP	Private consumption expenditure
CP ₋₁	Lagged private consumption expenditure
CPI	Consumer price index
ESTND	Estimated national debt
EX	Exports
EXCH	Exchange rate (Sri Lankan rupee/United States dollar)
FDI	Foreign direct investment
GBD	Government budget deficit
GDP	Gross domestic product
GDP ₋₁	Lagged gross domestic product
GDPD	Disposable gross domestic product
GDPN	Nominal gross domestic product (at current prices)
GDPW	World gross domestic product
GNTR	Government non-tax revenue
GNTR ₋₁	Lagged Government non-tax revenue
GR	Government revenue
GTR	Government tax revenue
ID	Domestic investment
IG	Government investment expenditure
IM	Imports
INFL	Inflation
MS	Money supply
ND	National debt
R	Nominal rate of interest
RR	Real rate of interest
TI	Total investment
TR	Tax revenue

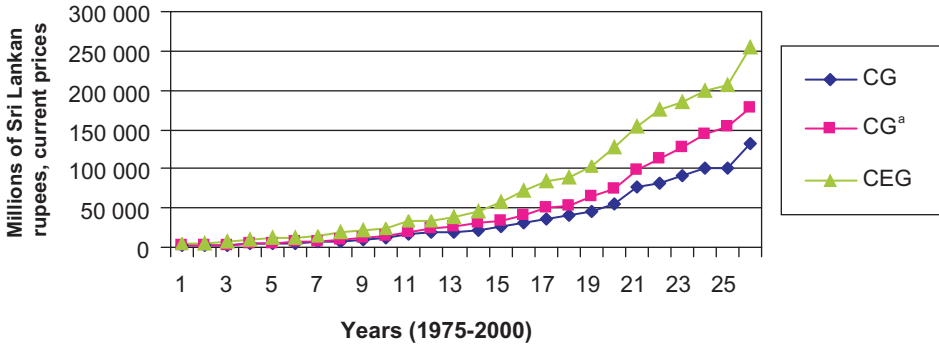
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Annex I

MAIN FEATURES OF THE GOVERNMENT BUDGET

Figure A.1. Current outlays of the Government

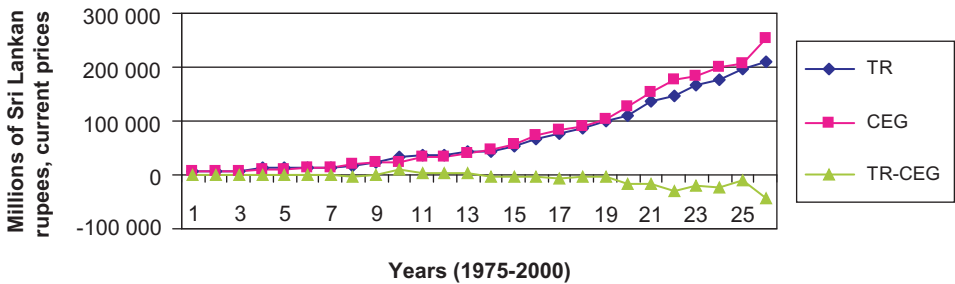


Source: Data from the Central Bank of Sri Lanka.

Abbreviations: See list of abbreviations.

^aData from United Nations (1975-2002).

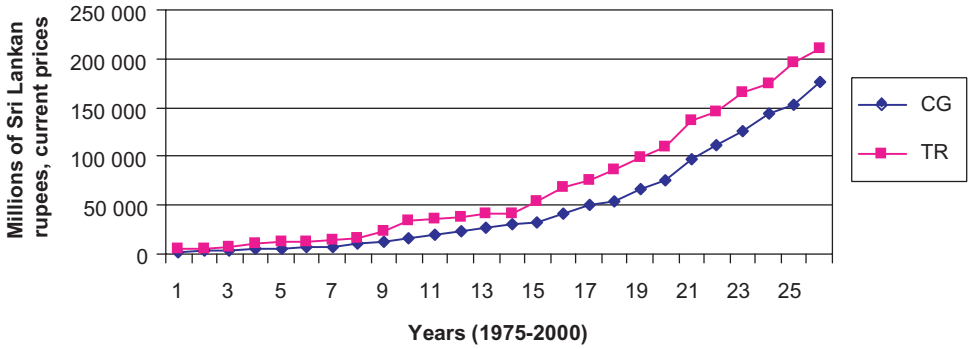
Figure A.2. Current deficit



Source: Central Bank of Sri Lanka (2000-2006).

Abbreviations: See list of abbreviations.

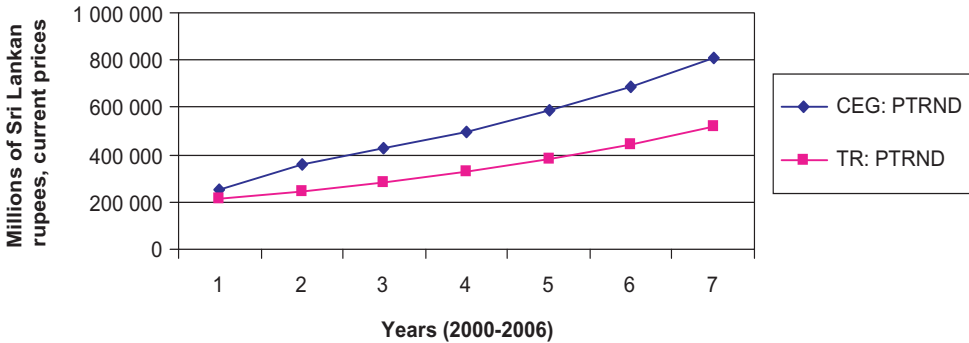
Figure A.3. Current primary deficit



Source: Central Bank of Sri Lanka (2000-2006).

Abbreviations: See list of abbreviations.

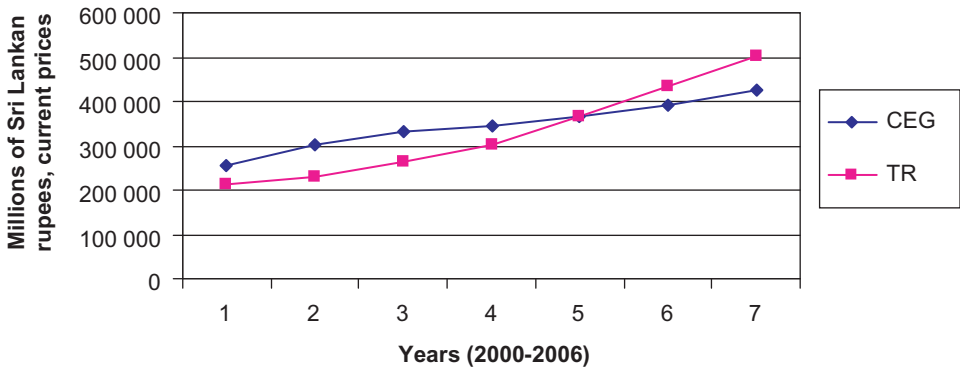
Figure A.4. Current deficits based on past trend



Source: Central Bank of Sri Lanka (2000-2006).

Abbreviations: See list of abbreviations.

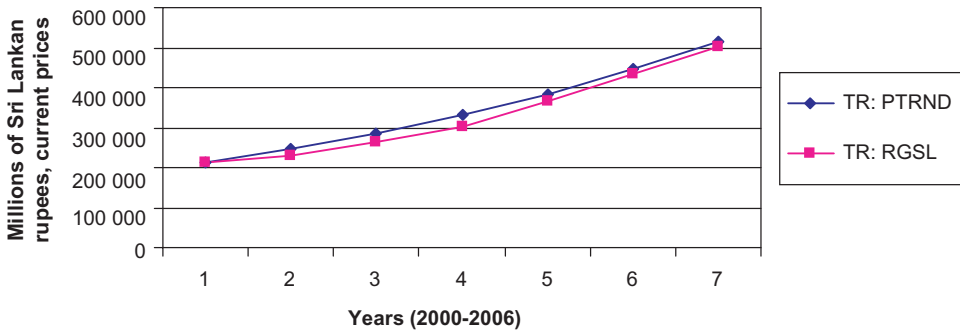
Figure A.5. Current deficits: reversal proposed by Government



Source: Data from Sri Lanka (2002).

Abbreviations: See list of abbreviations.

Figure A.6. Comparison of the total revenues of the Government



Source: Data from the Central Bank of Sri Lanka and Sri Lanka (2002).

Abbreviations: See list of abbreviations.

Annex II

THE ESTIMATED MODEL

Table B.1. Macroeconomic estimates

	<i>Equations</i>							
	<i>CP</i> (1)	<i>CG</i> (2)	<i>ID</i> (3)	<i>EX</i> (4)	<i>IM</i> (5)	<i>LogCPI</i> (6)	<i>GTR</i> (7)	<i>GNTR</i> (8)
Constant	12 500.62 (-1.21)	-2 702.07 (-0.53)	86 157.35 -6.3	-3 766.09 (-0.36)	-47 362.9 (-2.58)	-4.68 (-29.92)	12 395.32 (-2.05)	1 431.31 (-0.58)
CP ₋₁	0.51 (2.38)**	-	-	-	-	-	-	-
GDPD	0.42 (2.43)**	-	-	-	-	-	-	-
CG ₋₁	-	0.71 (5.52)*	-	-	-	-	-	-
GR	-	0.25 (2.58)*	-	-	-	-	-	-
BCP	-	-	0.45 (11.41)**	-	-	-	-	-
BCG	-	-	0.28 (2.31)**	-	-	-	-	-
FDI	-	-	0.5 (4.73)**	-	-	-	-	-
EXCH	-	-	-	62.05 (24.41)*	-	-	-	-
GNTR ₋₁	-	-	-	-	-	-	-	0.69 (4.67)*
GDP	-	-	-	-	0.5 (2.36)*	-	0.15 (19.77)*	0.01 (1.54)***
logMS	-	-	-	-	-	0.78 (51.96)*	-	-
R-Squared	0.99	0.96	0.94	0.96	0.95	0.99	0.94	0.77

Source: Results from the present study, based on data from United Nations (1975-2000).

Note: Figures in the parentheses are the t-values, significant at: (*) 1 per cent, (**) 5 per cent, (***) 10 per cent.

Abbreviations: See list of abbreviations.

Table B.2. Significant explanatory variables

<i>Equation</i>	<i>Significant explanatory variables</i>
1. Private consumption expenditure	Lagged private consumption expenditure, disposable gross domestic product
2. Government consumption expenditure	Lagged Government consumption expenditure, Government total revenue (tax and non-tax)
3. Investment	Bank credit to private sector, bank credit to Government, foreign direct investment
4. Exports	Exchange rate of Sri Lankan rupee/ United States dollar
5. Imports	Gross domestic product
6. Nominal rate of interest	None found
7. Inflation	Rate of growth of money supply
8. Government tax revenue	Gross Domestic product
9. Government non-tax revenue	Lagged government non-tax revenue, gross domestic product

Table B.3. Detailed sector-level econometric estimates, private consumption expenditure

	<i>Food, beverages and tobacco</i>	<i>Clothing, textiles and footwear</i>	<i>Electricity, water and gas</i>	<i>Other manufactured products</i>
Constant	38 021.8 (-7.33)	-4 896.2 (-2.97)	16 740.1 (-6.69)	-3 493.8 (-4.48)
GDPD	0.28 (34.4)*	0.05 (19.30)*	0.03 (7.5)**	0.03 (25.24)*
R-squared	0.98	0.94	0.71	0.97

Source: Results from the present study, based on data from United Nations (1975-2000).

Note: Figures in the parentheses are the t-values, significant at: (*) 1 per cent, (**) 5 per cent, (***) 10 per cent.

Table B.4. Detailed sector-level econometric estimates, domestic investment

	<i>Construction and land development</i>	<i>Machinery and equipment manufacturing</i>
Constant	16 467 (-0.22)	35 631.1 (-1.43)
BCP	0.22 (13.12)*	–
BCG	–	0.75 (3.26)*
FDI	–	1.06 (4.99)*
R-squared	0.89	0.56

Source: Results from the present study, based on data from United Nations (1975-2000).

Note: Figures in the parentheses are the t-values, significant at: (*) 1 per cent, (**) 5 per cent, (***) 10 per cent.

Abbreviations: See list of abbreviations.

Table B.5. Detailed sector-level econometric estimates, exports

	<i>Tea</i>	<i>Rubber</i>	<i>Other^a</i>	<i>Garments</i>	<i>Products</i>	<i>Other^b</i>	<i>Machinery and equipment^c</i>
Constant	25 593.5 (-10.43)	1 331.55 (-8.67)	3 451.31 (-4.33)	-48 307 (-8.70)	-341.48 (-0.91)	-15.98 (-10.77)	-0.63 (-1.63)
EXCH	260.1 (4.33)*	5.48 (1.46)**	168.27 (8.61)*	3 277.22 (24.08)*	70.13 (7.63)*	–	–
Log (EXCH)	–	–	–	–	–	–	2.48 (14.19)*
Log (GDPW)	–	–	–	–	–	5.53 (15.63)*	–
R-squared	0.45	0.08	0.76	0.96	0.72	0.91	0.9

Source: Results from the present study, based on data from United Nations (1975-2000).

Notes: Figures in the parentheses are the t-values, significant at: (*) 1 per cent, (**) 5 per cent, (***) 10 per cent. Log refers to natural log.

Abbreviations: See list of abbreviations.

^a Other agriculture.

^b Other manufactured products (in natural log form).

^c In natural logarithms.

Table B.6. Detailed sector-level econometric estimates, imports

	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)
Constant	-58.5 (-4.26)	18 193.77 -4.73	-63 532.6 (-12.87)	-10 298 (-5.51)	2 628.99 (-0.86)	-1 833.7 (-9.49)	-185.14 (-7.36)	-860.1 (-6.59)	25 946.24 (-2.89)
GDP	0.00013 (4.73)*	0.02 (4.43)*	0.15 (23.75)*	0.03 (13.76)*	0.04 (11.20)*	0.04 (23.79)*	0.04 (23.79)*	-	0.1 (8.96)*
TI	0.0004 (2.94)**	-	-	-	-	-	-	0.01 (16.4)*	-
R-squared	0.94	0.47	0.96	0.9	0.85	0.95	0.96	0.92	0.78

Source: Results from the present study, based on data from United Nations (1975-2000).

Note: Figures in the parentheses are the t-values, significant at: (*) 1 per cent, (**) 5 per cent, (***) 10 per cent.

Abbreviations: See list of abbreviations.

^a Rubber.

^b Other agriculture.

^c Textiles, footwear and leather products.

^d Food processing.

^e Chemicals and chemical products.

^f Non-metallic products.

^g Other manufactured products.

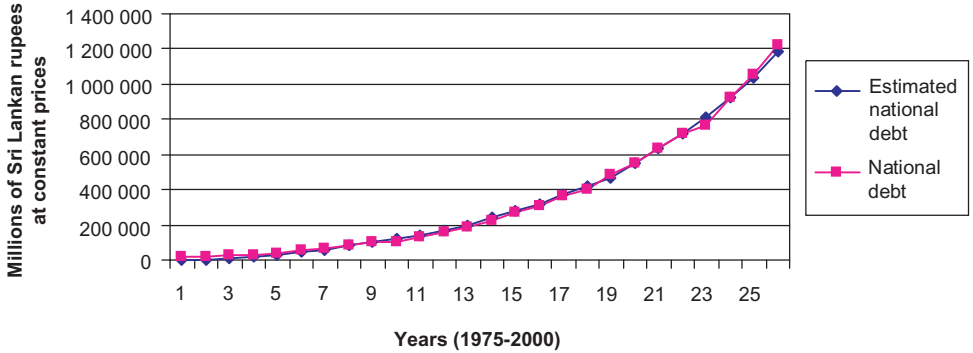
^h Machinery and equipment manufacturing.

ⁱ Basic metals.

Annex III

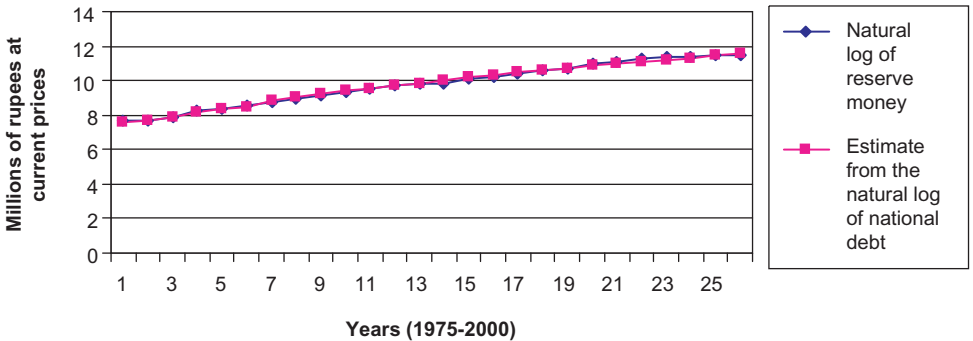
INFLATION AND THE GOVERNMENT'S BUDGET DEFICIT

Figure C.1. National debt and its estimate from Government's budget deficit



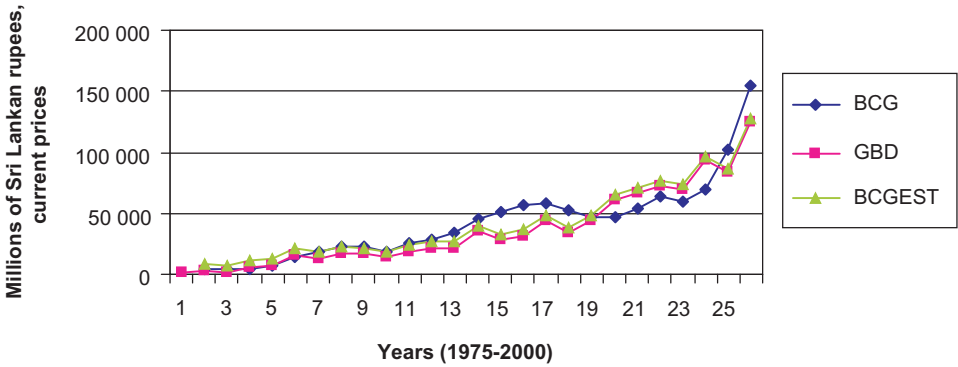
Source: Central Bank of Sri Lanka (2000-2006) and results from the present study.

Figure C.2. Natural log of monetary base and its estimate from the natural log of national debt



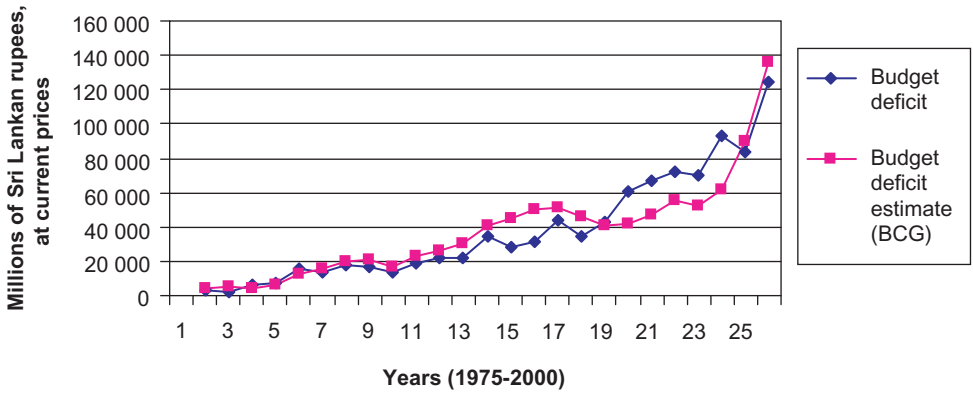
Source: Central Bank of Sri Lanka (2000-2006) and results from the present study.

Figure C.3. Bank credit to the Government and its estimate from the Government's budget deficit



Source: Central Bank of Sri Lanka (2000-2006) and results from the present study.
 Abbreviations: See list of abbreviations.

Figure C.4. Government budget deficit and its estimate from bank credit to Government



Source: Central Bank of Sri Lanka (2000-2006) and results from the present study.
 Abbreviations: See list of abbreviations.

Table C.1. Econometric estimates of national debt, monetary base, Government budget deficit and bank credit to the Government

	<i>Equation (C.1)</i> <i>National debt</i>	<i>Equation (C.2)</i> <i>Natural logarithm</i> <i>of money base</i>	<i>Equation (C.3)</i> <i>Government</i> <i>budget deficit</i>	<i>Equation (C.4)</i> <i>Bank credit to the</i> <i>Government</i>
Constant	-17 226.00	-1.00	608.58	5 583.82
ND ₋₁ + BD	1.26 (110.27)*	-	-	-
LogND	-	0.91 (63.49)*	-	-
BCG	-	-	0.87 (11.64)*	-
GBD	-	-	-	0.98 (11.64)*
R-squared	0.99	0.99	0.85	0.85

Source: Results from the present study, based on data from United Nations (1975-2000).

Note: Figures in the parentheses are the t-values, significant at: (*) 1 per cent, (**) 5 per cent, (***) 10 per cent.

Abbreviations: See list of abbreviations.