

# THE IMPACT OF INDEBTEDNESS ON ECONOMIC GROWTH OF SRI LANKA : AN EMPIRICAL STUDY<sup>1</sup>

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## ABSTRACT

*This study evaluates the impact of external debt on economic growth of Sri Lanka during the period 1972 to 2012. According to the results obtained through a time series estimation carried out in the study using cointegration methodology, debt-service ratio has no significant impact on economic performance. Nonetheless, total external debt ratio has a significant negative effect on economic growth. Therefore, the paper concludes that Sri Lanka's debt-export ratio has not crossed the critical levels.*

## 1. INTRODUCTION

After 1980s, in most developing countries, the rate of debt accumulation and increase in debt servicing are highlighted as major factors affecting the growth rate of output. The downward pressure was larger in the countries facing higher debt burden as these countries had higher interest rates, faced a decline in the external resource inflow, lower export earnings, lower domestic output and lower imports. In the case of South Asian countries, the external debt scenario has changed over time. Now, Sri Lanka has taken this external debt issue seriously. According to the government's Appropriation Bill, debt repayment expenditure in 2013 will rise to Rs. 1,154 billion (US\$9.1 billion) from Rs. 914 billion in 2012, a 26 percent increase. Furthermore, the government was exploring the possibility of obtaining a further assistance of US\$1 billion from the International Monetary Fund, after completion of the final tranche of the \$2.6 billion loan obtained in 2009 but, according to reports, did not continue the proceedings due to certain conditionality's put forwarded by the IMF. Under these circumstances, it is indeed imperative that Sri Lanka creates an efficient solution to overcome this external debt problem.

<sup>1</sup>[An earlier version of this study was presented at the Annual Sessions of the Sri Lanka Economic Association held on 10th Oct 2013.](#)

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## 2. THEORETICAL BACKGROUND

In neoclassical growth models, perfect capital mobility improves economic growth. The recent endogenous growth models argue that rising cost of foreign capital inflow reduces external borrowing causing a decline in long-run economic growth.

According to the debt-overhang theory, Myers (1977) and (Krugman, 1998) if debt is greater than the country's repayment ability and the expected debt servicing is an increasing function of output, then returns from investment in the country face a marginal tax by the external creditors, and new domestic and foreign investment is discouraged. Thus, large stock of debt reduces growth by lowering investment.

When considering the theoretical basis, Cunningham (1993) classified debt servicing as a primary factor of the production function to investigate the relationship between economic growth and external debt.

$$Y = (K, LF, DS)$$

Y is Gross National Product, K is capital stock, LF is the labour force and DS refers to debt servicing. Cunningham (1993) argued that when a country is significantly indebted to foreigners, this adversely affects both capital and labour productivity. This study uses a similar theoretical basis.

## 3. EMPIRICAL BACKGROUND

A number of empirical studies have examined the impact of indebtedness on growth. For instance, Cecchetti *et al.* (2011) investigates the real effects of debt. They examined debt and economic activity in industrial countries. The empirical results of their paper lead them to conclude that high debt is bad for growth. When public debt is in a range of 85 per cent of GDP, further increases in debt may begin to have a significant impact on growth. For corporate debt, the threshold is slightly lower, closer to 90 per cent, and the impact is roughly half as large. Meanwhile for household debt, they estimate that there is a threshold of around 85 per cent of GDP, but the estimate of the impact is extremely imprecise. The only possible conclusion is that advanced countries with high debt must act quickly and decisively to address their looming fiscal problems. The longer they wait, the bigger the negative impact will be on growth, and harder it will be to adjust. Using the Granger Causality test, Afxetiou and Serletis (1996) examine whether indebtedness has been detrimental to per-capita income growth in moderately- and severely-indebted countries. They found no such causality in a sample of 55 developing countries. Chawdhury (2001) finds that debt servicing as a percentage of either export earnings or GDP affect growth rate of GDP per capita adversely. This effect is equally important and statistically significant for developing countries which are facing heavy debt

burden. Pathberiya and Wijeweera (2005) give an overview of the external debt situation in Sri Lanka. They conclude that, Sri Lanka has been unable to maintain a satisfactory growth rate in export earnings to cope with the rising volume of external debt. Annual interest payments to foreign creditors have been relatively high even though most of the borrowing consists of concessional loans. This cost of borrowings is rather high and is often higher than the interest rate paid to Non-resident Foreign Currency (NRFC) account holders by the local banks. Interest payments as well as outstanding external debt has further increased due to the continuous depreciation of the value of the rupee against other major currencies of the world. Sri Lanka's experience was not so pleasant in this regard. It has been unable to allocate foreign borrowings exclusively for capital investments.

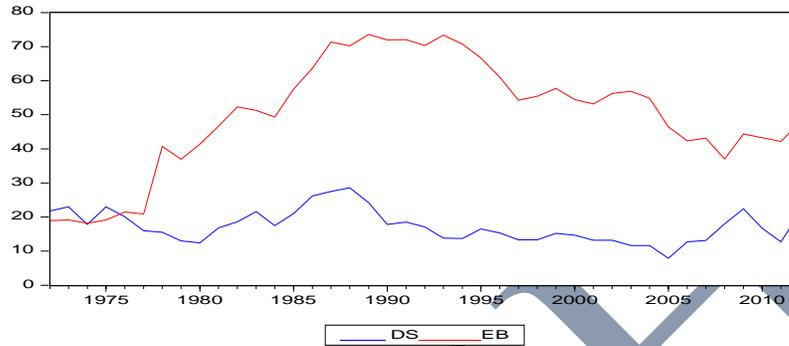
Wijeweera *et al.* (2005) also examine the impact of external debt on economic growth in Sri Lanka. Using a cointegration analysis of Sri Lanka with data from 1952 to 2002, they have investigated whether Sri Lanka faces a debt overhang problem. Results of this study indicate that Sri Lanka does not have a debt overhang problem, probably because total external indebtedness is not too high. External debt has not been a major obstacle to Sri Lankan economic growth over the past 40 years.

#### 4. DATA, METHODOLOGY AND RESULTS

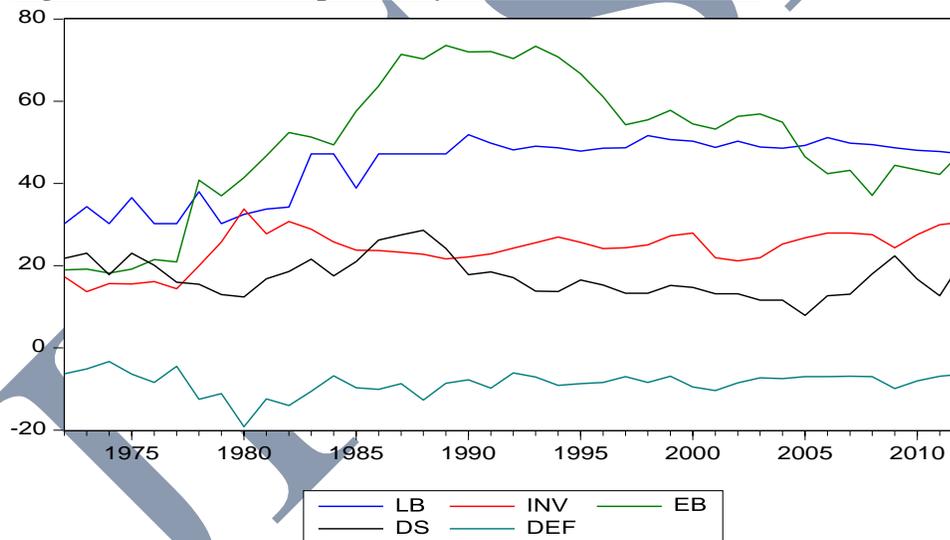
In this paper, the data used is annual secondary data over the period 1972-2012. The data was drawn from a number of secondary sources, including the Central Bank Annual Reports. Gross Domestic Product is the dependent variable. A modernized version of the Cunningham (1993) Model was used. From a theoretical basis, Cunningham (1993) classified debt servicing as a primary factor of a Production Function model to investigate the relationship between economic growth and external debt.

Since the study deals with time series data, a test for stationarity of data is a very important precondition before proceeding to deeper analysis. A unit root test is performed to examine the stationarity of time series. Most macroeconomic time series display a trending pattern with non-stationary fluctuations around the deterministic time trend. The trend can be completely deterministic or may contain stochastic components. It is essential to properly model the trend if we intend to estimate any long run relationships between them. The plots of variables use in the study against time are given in the Figures 1 and 2. The plots of almost all variables, as a preliminary indicator, demonstrate non-stationarity of variables.

**Figure 1: Debt service ratio and External Debt – Time Trend**



**Figure 2: Non- debt explanatory variables - Time trend**



In this study, an Augmented Dickey Fuller (ADF) unit root test is employed to check the stationary of data. If there is a unit root, then that particular series is considered to be non-stationary. Among three different specifications of ADF test the specification method chosen was one that includes both the trend term and the constant term. The Akaike Information criterion was used to decide the optimal lag length.

According to the ADF test results, all the variables were found to be stationary in first difference. Therefore, these variables were considered as integrated of order one or I(1). This result implies that the cointegration method can then be used.

This study used the Engle Granger cointegration technique. As a first step the model was estimated using the following equation.

$$LGDP = \beta_0 - \beta_1 DS - \beta_2 EB + \beta_3 INV + \beta_4 LB - \beta_5 DEF + \varepsilon_t$$

LGDP is the dependent variable and is the log value of GDP  $\{\log(GDP)\}$ . It is the log value of the Gross domestic product. Investment as a GDP ratio (INV), labour force participation rate (LB), debt service ratio (DS), budget deficit to GDP ratio (DEF) and external debt as a GDP ratio (EB) are independent variables. The debt service ratio is given as a percentage of earnings from the export of goods and services.

According to the Engle-Granger cointegration test, the second step is testing the stationarity of the residuals. This residual series is stationary in levels. In addition to the Engle-Granger cointegration test, we also used the Johansen Cointegration Test. Using this, it is found that only one cointegration relationship exists.

Table 1: Cointegration Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LB	0.204213	0.030810	6.628093	0.0000
INV	0.143600	0.039945	3.594924	0.0010
EB	-0.034666	0.012719	-2.725592	0.0100
DS	-0.039711	0.029832	-1.331150	0.1917
DEF	0.067650	0.065162	1.038183	0.3063
C	3.354817	1.328297	2.525653	0.0162

The impact of independent variables like investment-GDP ratio (INV), labour force participation rate (LB), external debt to GDP ratio and debt service ratio have expected signs but except for the debt service ratio only investment-GDP ratio (INV), labour force participation rate (LB), and external debt to GDP ratio are statistically significant. The sign of the coefficient of DEF-GDP is positive and is not statistically significant. The impact of investment-GDP ratio is positive and statistically significant, supporting the findings of earlier studies that capital formation is the main source of economic growth. As expected, labour force participation has a positive and statistically significant impact on economic

growth. In this case we use two debt burden indicating variables. The first is external debt to GDP ratio and the other is debt service-to-exports ratio. Both variables are found to have a negative effect and external debt to GDP ratio is statistically significant while debt service to exports ratio is not statistically significant. The results also partially support the findings of earlier studies, like Wijeweera *et al.* (2005) Over the last 40 years, Sri Lanka's debt service ratio was around 10-30 percent. In 2012, it was close to 21 per cent. According to the literature, at a debt service ratio greater than 50 per cent, a country risks facing a debt overhang problem. According to cointegration results, we can conclude that Debt service ratio hasn't a significant effect on economic growth. However, the impact of external debt on economic growth is negative and statistically significant. By contrast, the current total external debt ratio in Sri Lanka remained close to 50 per cent. With this situation there is a negative significant effect on GDP. When the non-debt inputs were examined, investment and labour force participation have a positive effect on economic growth.

Investment spending makes a direct contribution to economic activity because investment is one of the components of total expenditure in an economy. There is general agreement that, in all countries, the process of economic growth and investment/capital formation is closely interconnected. Both neo-classical and Marxist economists have placed main emphasis on capital accumulation as the engine of economic growth. All growth models focus on capital as one of the two central parameters in determining the rate of economic growth. An increase in the capital stock certainly is needed to promote growth of production. Investment in infrastructure is particularly important for the development of less-developed countries. According to the results of this study, investment has a positive and statistically significant effect on economic growth.

## CONCLUSIONS

This study examined the impact of indebtedness on economic growth. Based on econometric analysis, the following conclusions can be derived. The first, and most important conclusion is that the debt service ratio has a negative effect on log GDP. But this effect cannot be seen in the long-run. By contrast, external debt ratio has a negative significant effect on log GDP in the long-run. But, this negative impact is relatively small. Therefore, we can conclude that in the Sri Lankan case the debt-export ratio has not crossed the critical levels. According to other non-debt explanatory variables results, investment and labour force participation have significant positive effect on Sri Lanka's economic growth in the long-run.

All the indicators of debt burden included in the study highlight the importance of improving economic management. This could be in the form of improving the efficiency of resource use so that the debt burden can be effectively reduced.

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*Appendix***Unit root Test Results - ADF Test**

	First difference	Mackinnon Critical for Rejection of Hypothesis of a Unit Root			
Variable	t-Statistic	1%	5%	10%	Decision
<b>Log GDP</b>	-4.795191	-4.211868	-3.529758	-3.196411	Stationary
<b>INV</b>	-5.922773	-4.211868	-3.529758	-3.196411	Stationary
<b>LB</b>	-7.862775	-4.219126	-3.533083	-3.198312	Stationary
<b>EB</b>	-6.427590	-4.211868	-3.529758	-3.196411	Stationary
<b>DS</b>	-5.982589	-4.211868	-3.529758	-3.196411	Stationary
<b>DEF</b>	-4.063414	-4.243644	-3.544284	-3.204699	Stationary

**Regression Model**

Dependent Variable: LGDP

Method: Least Squares

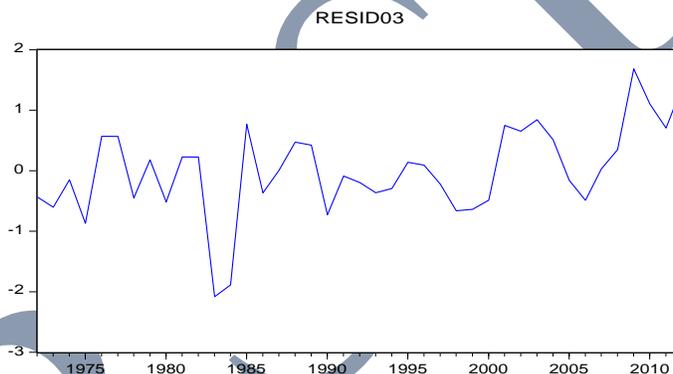
Sample: 1972 2012

Included observations: 41

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LB	0.204213	0.030810	6.628093	0.0000
INV	0.143600	0.039945	3.594924	0.0010
EB	-0.034666	0.012719	-2.725592	0.0100
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C	3.354817	1.328297	2.525653	0.0162

R-squared	0.828005	Mean dependent var	12.87529
Adjusted R-squared	0.803435	S.D. dependent var	1.804137
S.E. of regression	0.799876	Akaike info criterion	2.525740
Sum squared resid	22.39308	Schwarz criterion	2.776507
Log likelihood	-45.77767	Hannan-Quinn criter.	2.617055
F-statistic	33.69893	Durbin-Watson stat	1.206066
Prob(F-statistic)	0.000000		

### Stationarity of the Residuals



			t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic			-3.915306	0.0044
Test critical values:	1% level		-3.605593	
	5% level		-2.936942	
	10% level		-2.606857	

**Cointegration test results – Johansen Cointegration Test.**

Hypothesized		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.593374	97.10683	95.75366	0.0402
At most 1	0.446499	62.01222	69.81889	0.1788
At most 2	0.416716	38.94403	47.85613	0.2625
At most 3	0.222852	17.91987	29.79707	0.5720
At most 4	0.180627	8.086990	15.49471	0.4562
At most 5	0.008110	0.317570	3.841466	0.5731