Debt Crisis of Sri Lanka

A case study on how debt drove Sri Lanka to its economic crisis.

Group 2

Introduction

Sri Lanka defaulted on its debt in May 2022, for the first time in its history. With a current external debt of 50.6 billion USD and foreign reserves depleting to critically low-levels Sri Lanka is facing a severe debt crisis. Years of mismanagement, corruption and misgovernance have led the country to its current state. This case study discusses how debt has affected the economic crisis in the island.

Under the first objective, the relationship between GDP and debt as well as the relationship between budget deficit and debt in Sri Lanka is analysed using a regression model to see the trends and the nature of relationships. The next objective studies the policies that have led to national debt followed by each government from 1948 to 2022 and their impact on economic growth. Policies and the factors such as exports in US dollars and debt service payments are analysed through time series and regression models to identify what drove the island nation to its economic crisis. The next objective is to follow up on how the highways sector was financed through borrowings, analyse their returns, and understand their contribution to the national debt. The final objective is to examine the debt management of a model nation and the actions they have taken to maintain its fiscal policy. Here Singapore is chosen as the model nation. Also, the effect of national debt on economic growth is studied here.

Literature Review

The budget deficit can be treated as one of the main causes of public debt. Alam and Taib (2013) discusses the relationship between the external debt of a country and budget deficit in the context of a few Asian Pacific developing countries and it shows a positive relationship between the two variables. According to Pathberiya and Wijeweera (2005), if any country is to manage its external debt, it should maintain a high rate of export earnings in terms of foreign exchange, and the pattern of external debt growth and growth of export earnings is highly dependent on policies adopted by successive governments. According to the study done by Amal S. Kumarage (2014) not conducting proper feasibility studies, wastage and not considering the cost of investment proportionate to the scale of economic returns causes the construction of underutilized assets and it creates an increasing financial burden by accumulating more debt. Existing literature shows a negative relationship between public debt and economic growth (Çifligu, 2018). Maqbool and Shahid (2021) shows how financial management has played an important role in Singapore's remarkable economic success since its independence furthermore it describes the major economic crisis which affected Singapore and the steps taken by the country to overcome them.

Methodology

The first objective was divided into two main sections. First, a time series analysis was done to analyse the variation of the national debt, budget deficit and GDP from 1948 to 2022. The following vector autoregressive models were used for this purpose.

$$Budget\ deficit = \alpha_1 Budget\ deficit + \alpha_2 Budget\ deficit + \alpha_3 Debt + \alpha_4 Debt + \alpha_5 GDP + \alpha_6 GDP \quad (1)$$

$$Debt = \beta_1 Budget\ deficit + \beta_2 Budget\ deficit + \beta_3 Debt + \beta_4 Debt + \beta_5 GDP + \beta_6 GDP \quad (2)$$

$$GDP = \gamma_1 Budget\ deficit + \gamma_2 Budget\ deficit + \gamma_3 Debt + \gamma_4 Debt + \gamma_5 GDP + \gamma_6 GDP \quad (3)$$

Next, a regression analysis was done to ascertain the relationship between GDP and debt, budget deficit and debt. Before the regression analysis, the Jarque-Bera test was conducted to confirm the normality of the data and the Augmented Dicky Fuller test was done to check the stationarity of the data.

In the next objective, initially, the two main factors that were spotted as affected by policies were identified as exports and debt service payments. In the first part of the analysis, exports and debt service payments were plotted against time to address the peaks and dips with the policies. Next, a regression analysis was conducted for economic growth and exports to analyze the impact of exports on GDP growth. The following model was used for the regression analysis.

$$Economic\ Growth = \beta_0 + \beta_1 Exports + i \quad (4)$$

Finally, it was tested whether the policies play a major role in the economic growth of the country by considering the relationship between policies and exports followed by the impact of exports on GDP. Data from 1948 to 2022 were used in this analysis.

The population of the data to be analyzed under the third objective was highway projects started in Sri Lanka after the year 2000. A sample of 13 highways was selected under this. As the first step, a breakdown of funding was done for each project to show foreign and local debt used for each of them. Next, the actual costs were compared with the planned costs. After that, hypothesis testing was done to compare the local mean cost per km with the global mean cost per km when constructing highways of similar conditions. Standard figures issued by the University of Oxford were used for this and the test used was Wilcoxon's signed rank test.

Next, a cost analysis was done to calculate the financial internal rate of return for each project using the current annual capital, annual operational income, and annual revenue. These IRR values were then compared to the planned IRR values. Finally, a graphical analysis was done to show the portion of total highway debt from the national debt.

As the first part of the final objective, a multiple linear regression analysis was done to investigate the effect of national debt on economic growth for Singapore and Sri Lanka. Here

the factors that were identified as determinants of economic growth were debt to GDP, exports, and gross savings.

$$Economic\ growth = C + (\propto\ Debt\ to\ GDP) + (\beta\ Export) + (\gamma\ Gross\ Savings) \quad (5)$$

Before estimating the model, several assumptions such as the linear relationship between independent and dependent variables, multicollinearity between variables, independence of residuals and heteroscedasticity were tested.

Next, an overview comparison of the two countries was done and a timeline was drawn for the development of the economic history of Singapore. Next, it was investigated how Singapore managed their economic crisis with debt management, fiscal policy, and their policies in budget handling and recommendations were made as to what Sri Lanka can learn from Singapore in those areas.

Results

Time series analysis

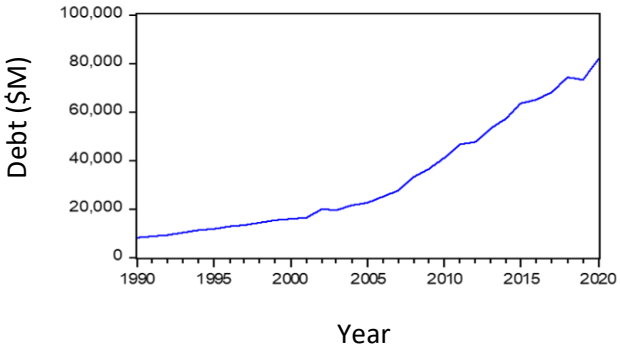

Figure 1 This graph shows the variation of national debt of Sri Lanka over the years. It can be observed that the debt has been increasing with time.

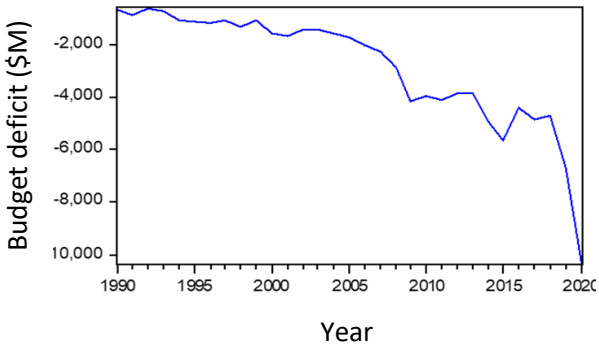

Figure 2 This graph shows the variation of budget deficit with years. The budget deficit has been increasing steadily over the past few years.

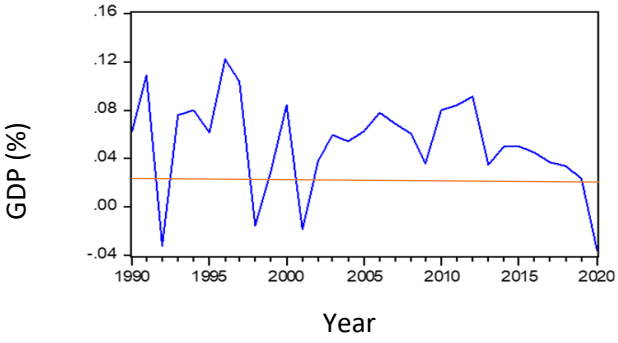

Figure 3 This graph shows the variation of GDP with time Economists say that the ideal GDP is a value of 0.02 which is denoted by the red line in the graph. A GDP percentage above the ideal percentage is considered as a positive economy while a GDP percentage below the ideal GDP percentage is a negative economy. It can be observed that Sri Lanka has continuously experienced a drop in GDP percentage over the years.

Regression Analysis to identify the relationship between GDP, Debt and Budget deficit

Before this, the Jaque-Bera test for normality and the Augmented Dickey-Fuller test for unit roots were conducted. And the results showed that GDP, debt, and budget deficit are not normally distributed and free from unit roots in the mentioned number of years for the study.

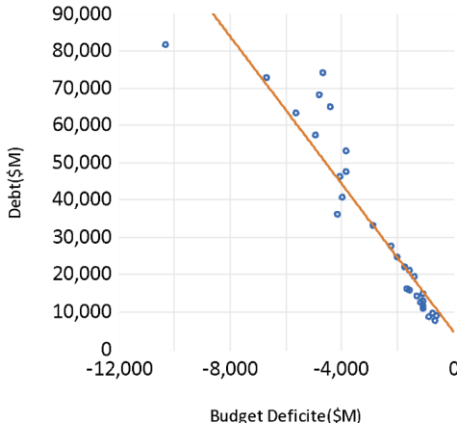

Figure 4 This plot was obtained as a result from the linear regression. After a hypothesis testing it was concluded that there is a serial correlation between debt and the budget deficit.

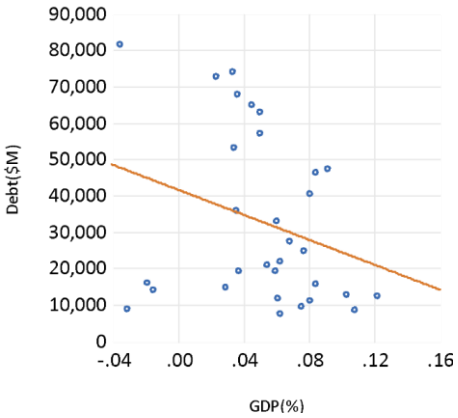

Figure 5 This plot was obtained as a result from the linear regression. After a hypothesis testing it was concluded that there is a no serial correlation between debt and the GDP percentage.

Graphical analysis of exports, debt servicing and related policy changes

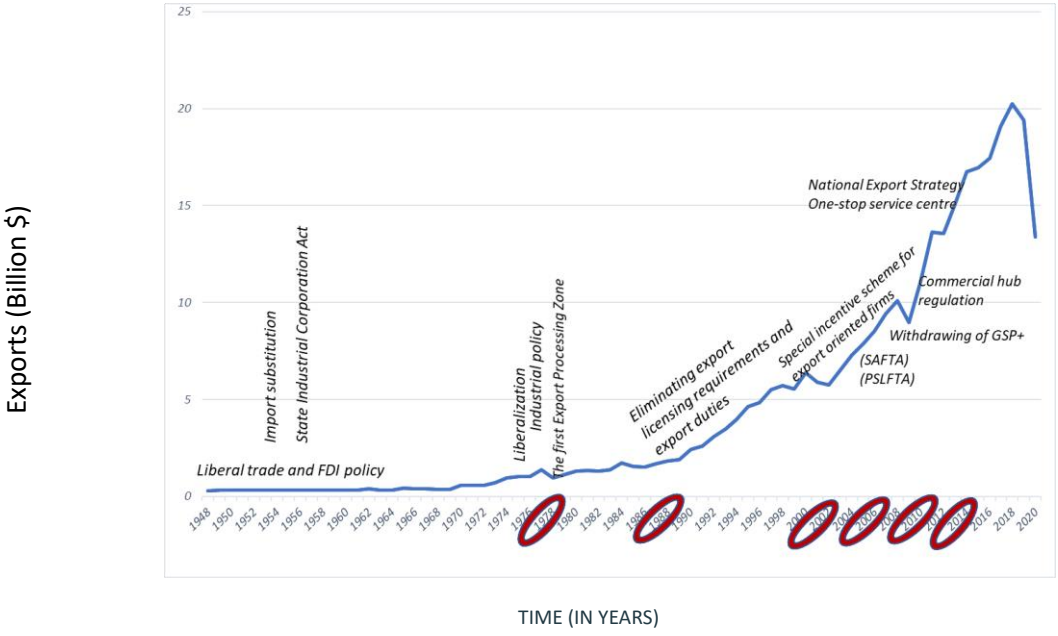

Figure 6 This graph shows the variation of exports with time. The policy changes with their respective year of change are marked here.

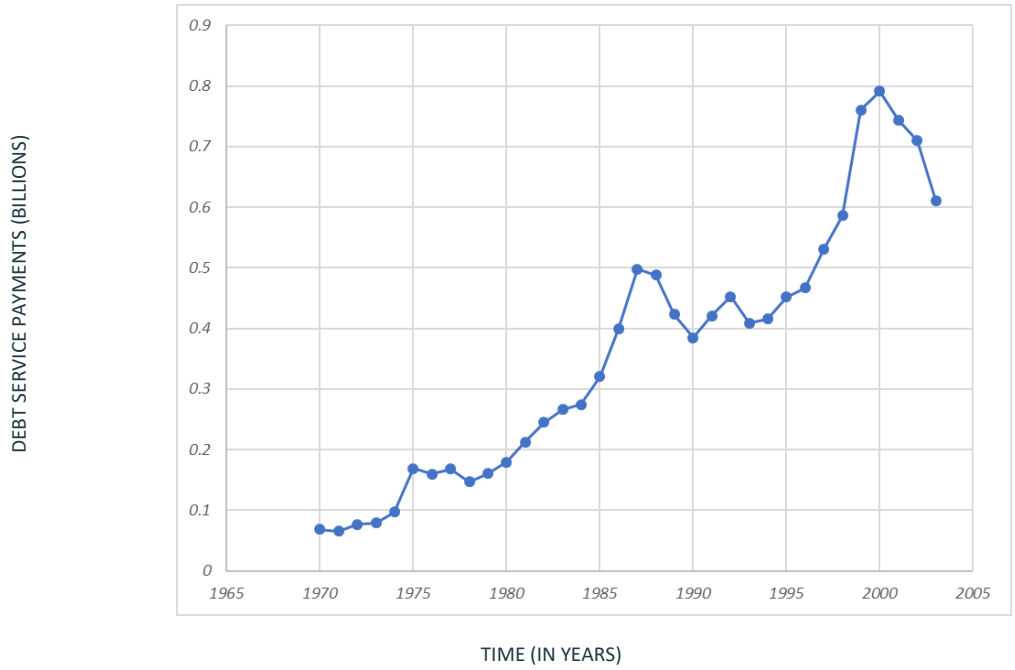

Figure 7 The above graph shows the variation of debt service payments over the years. From the above two graphs, we can see that in many instances when exports are high, debt service payments are low.

Sri Lankan economic policies have driven in various directions over the last century. At the time of independence, a liberal trade scheme existed, and external debt was represented only by sterling loans that were incurred during the pre-independence period. However, from 1950 onwards, the country started receiving project-based assistance from countries such as China, the USA and the former Soviet Union and a combination of changes in political leadership and growing balance-of-payments problems induced a policy shift toward a state-led import-substitution strategy. Some of the policies after post-independence are the Scheme of Industrialization which established a state monopoly over basic and strategic industries (1957) and imposed protective tariffs for some infant industries and raw materials (1970).

Then, bloomed the 1977 liberalization with significant trade policy reforms, opening up of the economy to FDI, with new incentives for export-oriented FDI under an attractive free trade zone (FTZ) scheme, abolition of the multiple exchange rates, alongside an EOFDI five-year plan with relaxed FE restrictions (1972 -1977), the first Export Processing Zone (EPZ) was set up in Katunayake in 1978 and the Export Development Board was established in 1979 to support the promotion and development of exports. Agreements like the South Asian Preferential Trading Arrangement (SAPTA) in 1995 and Pakistan Sri Lanka Free Trade Agreement (PSLFTA) in June 2005 led to an increase in exports. Access to the Special Incentive Arrangements such as GSP+ concessions from the EU since 2005 helped expand market share in the EU as it surpassed the USA as Sri Lanka's prime export destination by 2006. The decline after 2001, could be explained by the September Attack on the USA in 2001 and the global economic recession triggered by the Subprime crisis, which led to the decline of exports in 2009. Thus, it is crystal clear that economic policies and development directions of the Sri Lankan economy have been inconsistent for over a century and have taken various facets making the economic mayhem.

Regression Analysis to identify the impact of exports on economic growth

Table 1 Given below are results for the regression analysis. If p< 0.05, then there is a significant impact, we reject null hypothesis. Also, since the coefficient of exports is 4.7, it implies that for a change of 1 unit of exports, 4.7 units of GDP will be increased.

Method: Least Squares Included observations: 59

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Exports $	4.700863	0.126599	37.13176	0.0000

Analysis of how the highway sector was financed through borrowings

Total cost and debt allocation for each project. The total cost of the projects in consideration and the amount funded through foreign debt and domestic debt could be shown below.

Table 2 Breakdown of debt allocation on each project into foreign and domestic sectors.

Project	Total ($ million)	Domestic	Foreign
Southern Expressway	741.1	66%	34%
Outer circular	1046	45%	55%
Colombo Katunayake	350	85%	15%

Comparison of real costs and planned costs

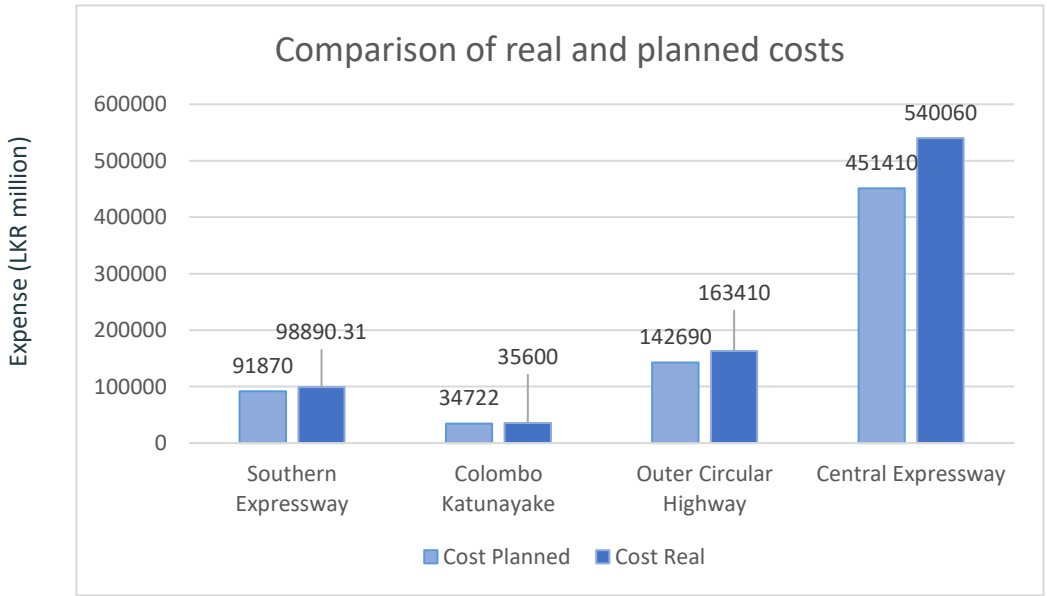

Figure 8 The above graphs show the actual and planned cost for each of the project in the study. The top two and the bottom left graphs show the progression of real and planned costs with the phases of the projects. The bottom right graph shows the current value of real cost compared with the planned cost up to date.

It can be observed that for all the projects the actual costs are higher than the planned costs.

Comparison of local and global costs per km

Results from Wilcoxon's signed rank test:

1. Testing against global medium-level average cost per km value. (2.8 million USD/km)

Table 3 Hypothesis test summary

	Null Hypothesis	Test	Sig.	Decision
1	The median of VAR00001 equals 2.80.	One-Sample Wilcoxon Signed Rank Test	.002	Reject the null hypothesis.

Asymptotic significances are displayed. The significance level is .050.

Here the null hypothesis could be rejected at a 5% significance level. Therefore, it could be concluded that the local average cost per km is higher than the global medium-level average cost per km for highways of similar conditions.

2. Testing against global high-level average cost per km value. (7.8 million USD/km)

Table 4 Hypothesis test summary

	Null Hypothesis	Test	Sig.	Decision
1	The median of VAR00001 equals 7.80.	One-Sample Wilcoxon Signed Rank Test	.064	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .050.

Here the null hypothesis could not be rejected at a 5% significance level. Therefore, it could be concluded that the local average cost per km is lower than the global high-level average cost per km for highways of similar conditions.

Comparison of Planned and Real IRR values:

Table 5 Below table shows a comparison of planned IRR and the real IRR calculated using current values.

Highway	IRR (Planned)	IRR (Real)
Southern Expressway	9%	5%
Colombo - Katunayake Expressway	9%	-2%
Outer Circular Expressway	10%	-1%

When IRR values were calculated for each project using the current annual revenue, running cost, and capital investment figures it was observed that for all the projects the real IRRs are lower than their planned IRRs.

Contribution of highway debt to the total national debt

When the current total debt figures were analysed, it was observed that the highway debt amounted to 24% of the total national debt of the country.

Multiple Regression Analysis to get the relationship between economic growth and other independent variables in Sri Lanka and Singapore.

Based on the regression analysis the following model was obtained.

Sri Lanka:

$$Economic\ growth = 17.87 - (0.27 * Debt\ to\ GDP) + (0.08 * Export) + (0.14 * Gross\ savings) \quad (6)$$

Singapore:

$$Economic\ growth = 5.83 - (0.15 * Debt\ to\ GDP) + (0.04 * Export) + (0.126 * Gross\ savings) \quad (7)$$

Time series charts for the variation of debt to GDP ratios of Sri Lanka and Singapore

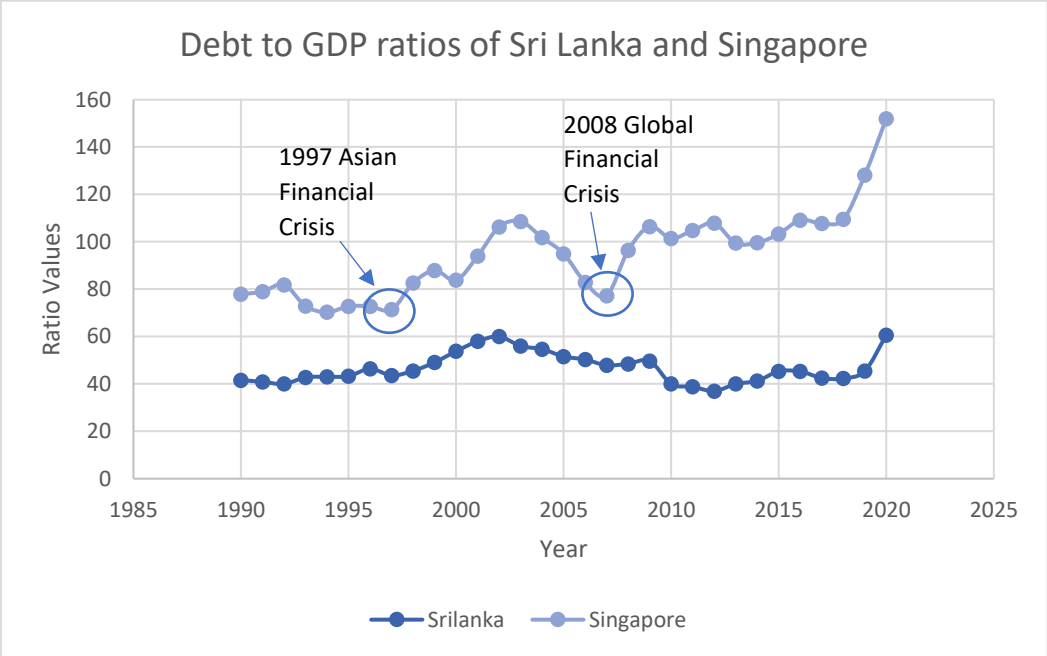

Figure 9 The above graph is the time series chart of the debt to GDP ratios of Sri Lanka and Singapore. It shows the peaks and troughs in the ratios in various events in history such as the 1997 Asian financial crisis and the 2008 global financial crisis.

What Sri Lanka can learn from Singapore?

Government effectiveness – Quality of public service provision, quality of bureaucracy, the competence of civil servants, and the credibility of the government's commitment to policies.

Policy consistency and establishing the right economic fundamentals-

Management of state entities – Professionals running the business earn the same as in a private company and the work culture is set to be right.

Developing a strong monetary system- To avoid problems like poor people being affected by inflation, Employees requesting more wages, Singapore set a framework for the market-based system, understanding the role of government.

Budget handling- The need for a balanced budget to remain fiscally sustainable. A budget needs to be designed to address the current and future needs, concerning What are national priorities? What trade-offs need to be made? Are the plans financially viable?

Conclusions

The purpose of this case study is to examine the factors which drove Sri Lanka into a debt crisis. As per the results from the regression analysis where the relationship between the national debt and the budget deficit is investigated, the study finds an inverse relationship between the two variables. The governments of Sri Lanka have shown a pattern of obtaining more debt while increasing budget deficits over the past years. This can be identified as a major cause of the current debt crisis in the island.

We can conclude that policies have majorly contributed to debt service payments due to the inverse relationship between exports and debt service payments, given that the exports are affected by the policies. (2) Furthermore, the study concludes that policies affect economic growth, since exports show a significant impact on GDP growth, given that exports are highly affected by the policies implemented.

Next, the study analyses the costs and funding in the roads and highway sector. The study concludes that these projects do not earn enough revenue to cover up their initial investments. (3) In a backdrop where the projects are funded majorly through foreign debt and when those projects do not earn enough revenue, more debt is allocated to service those initial debts. This leads up to a continuous rise in highway debt and thus the rise in national debt.

Finally, the case study investigates debt management policies followed by a model nation, Singapore and compares the effect of national debt on economic growth between Singapore and Sri Lanka. (4) Here it shows that there is a more favorable effect on economic growth by national debt in Singapore relative to that in Sri Lanka. The policies that have been followed by the governments of Singapore offers insights into better debt management which can be followed by Sri Lanka to overcome the current debt crisis.

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