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SUSTAINABILITY OF PUBLIC DEBT IN SRI LANKA: AN ECONOMETRIC ANALYSIS

Graduate School of Economics, Nagoya University
Academic Advisor: Prof. NEMOTO Jiro
Name: COORAY Nawalage Lakshmi Anushka

SUSTAINABILITY OF PUBLIC DEBT IN SRI LANKA: AN ECONOMETRIC ANALYSIS

By

COORAY Nawalage Lakshmi Anushka

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Dissertation Advisory Committee:
Professor NEMOTO Jiro (Chair)
Professor MANGYO Eiji
Professor YANIGAHARA

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List of Abbreviations

ARDL	Auto Regression Disributed Lag
ADF	Augmented Dickey – Fuller Test
CBSL	Central Bank Of Sri Lanka
ECM	Erro Correction Model
GDP	Gross Domestic Product
IMF	International Monetary Fund
NDL	Natural Debt Limit
NGO	Non Government Organisation
OECD	Organisation for Economic Co-operation and Development
PP Test	Phillips – Perron Test
SVAR	Structural Vector Auto Regression
T- Bills	Treasury Bills
T- Bonds	Treasury Bonds
VAR	Vector Auto Regression

Chapter One
Introduction

1.1 Background

Recently, public debt has become one of the critical economic issues among policy makers in Sri Lanka. By the end of 2017, the average debt to GDP ratio in Sri Lanka was 77.6 per cent. Debt service payments totalled Rs.1603 billion, while the total interest payment on public debt as a percentage of GDP was 5.5 per cent in 2017 (Central Bank of Sri Lanka, 2017). According to the IMF (2003) the debt level of a country is sustainable if the ratio is below 60 per cent. However, this ratio is much higher in Sri Lanka. And given this critical situation, the government is under pressure to establish debt sustainability policies and consider stabilising debt ratio at a feasible range. With the goal of achieving this acceptable range, the government attempted to reduce the debt ratio to 60 per cent by the end of year 2016.

The public debt of a country has many implications and consequences, and Sri Lanka is no exception. Clements et al. (2003), Malik et al. (2010), Pattillo et al. (2011), Reinhart and Rogoff (2010), Reinhart et al. (2012), and Safdari and Mehriz (2011) argue that a higher debt-to-GDP ratio negatively affects economic growth. Greiner (2011) shows that when there is an increase in the debt-to-GDP ratio, the budget deficit may increase. Lin (2000) shows that if the growth rate is greater than the real interest rate, debt will increase the growth rate of real per-capita output, and if the growth rate is lower than the real interest rate, debt will decrease the growth rate of real per-capita output. According to Kumara and Woo (2010), a higher level of debt stock increases interest rate and inflation. A high interest rate in the local market further increases the

cost of borrowing for the private sector; enormous debt and substantial budget deficits generate a crowding-out effect, and this discourages private sector investment, which in turn negatively affects the long run economic growth potential of a country. In fact, this is an ongoing debate in Sri Lanka, as some policy makers have mixed opinions on the consequences of the heavy public debt on the economy.

There is no one definition of debt sustainability; different researchers and economic reviewers present different definitions. Kappagoda (2004, p. 166) defines the debt sustainability of a country as the 'ability to service its borrowings—foreign and domestic; public and publicly guaranteed, and private non-guaranteed; and short and long-term debt—without compromising its long-term goals and objectives'. Debt sustainability can mainly be divided into two categories, solvency and liquidity. Liquidity can be defined as the ability of the government to repay its debt on time with interest from its cash inflows. Solvency refers to the non-accumulation of excessive debt in comparison to GDP and the ability to obtain new debt at a reasonable cost. There is no specific way to measure debt sustainability because all the countries are at different levels of development. Thus, this sustainable level of the debt is estimated by using benchmarks of different debt indicators, but there is no specific level of debt indicators that can be used in all countries. Therefore, sustainability can be defined as a dynamic concept that can be estimated using different indicators.

Generally, debt sustainability can be estimated via two indicators, namely, debt-to-GDP ratio and debt service payment as a percentage of the reserves. Debt sustainability is important to a country because public debt impacts the final outcome of that country's fiscal policy. Therefore, to establish debt sustainability, a government should consider stabilising the debt-to-GDP ratio at a feasible range and avoid increasing the ratio to an unsustainable level.

Every country has a legal agreement to settle down its foreign debt. The present value of the resources transferred to foreign countries should be equal to the starting debt stock of the country; in such a situation, the debt settlement of the country is sustainable. To repay the loans in the future, a borrowing country should create a budget surplus. However, if the discounted value of the future budget surplus is lower than the present debt stock, the debt is called unsustainable. This will lead to an inability to settle the debt services including the interest and principal repayment. A country that has continuously recorded a primary surplus of its budget it will tend to face an increased likelihood of the debt sustainability for a few reasons. The repayment of accrued interest will decrease, which will decrease the crowding-out effects. It will also improve the efficiency of the resource distribution and income through decreasing the accumulated interest payments. Furthermore, debt sustainability is enhanced by increasing the demand of the monetary base because of decreasing inflationary expectations.

Different methods can be used to finance a government's budget deficit. Researchers have explained that each financing source is associated with different problems and risks that may cause many further economic implications. One very important method for a government to finance its budget deficit is by raising capital from internal sources, These internal sources include money from the Central Bank of Sri Lanka as well as money generated from the domestic commercial bank and non-bank sectors. External debt means comes into the segregation of External debt. If the government print's money to address its budget, inflation will definitely increases. However, if the government uses finances from commercial banks, it will reduce money that is circulating in the private sector for investment and create a crowding-out effect. The use of reservers might generate exchange-rate movements and create balance-of-payment crises (Akcay, Alper & Ozmucur, 2005). Unsustainable external debt creates

macroeconomic instability, leading to economic downturns and the loss of international competitiveness.

Some researchers have concerns about how this pubic debt impacts the GDP of a country and what the optimal (threshold level) is on the debt in their country. The latest literature shows that there is a nonlinear relationship between public debt and economic growth (Reinhart & Rogoff, 2012, Checherita & Rother, 2012, Parttillo, 2002 and Cohen, 1997). Accordingly, there is a positive relationship between public debt and economic growth up to a certain threshold level; beyond that point, its impact on economic growth becomes negative. Two recent empirical studies, by Checherita and Rother (2012) and Reinhart and Rogoff (2012). found a non-linear relationship between public debt and economic growth using two completely different techniques (exogenous debt basket and panel data regression methods) for the analysis. A paper by Reinhart and Rogoff (2012) found that when public debt goes beyond the 90 per cent level, there is a negative correlation to economic growth; they concluded that the optimum debt level is 90 per cent of the GDP. They used more than 200 years of observations in their analysis of developed as well as developing countries. However, these findings have been challenged, such as by Herndon, Ash and Pollin (2013), who argued that 'Reinhart and Rogoff made significant errors in reaching the conclusion that countries facing public debt-to-GDP ratios above 90 per cent will experience a major decline in GDP Growth'. However, this public debt threshold limit differs from study to study. Checherita Westphal and Rother (2012) explained that beyond 90–100 per cent of GDP, public debt is associated with lower long-term economic growth. They used the smooth threshold regression model to estimate the optimal debt level. Cecchetti et al. (2011) found a nonlinear relationship between public debt and economic growth as well as a threshold level of 85 per cent of GDP. Koehler-Gieb (2010) analysed the panel data of a large

number of countries, revealing a threshold level of 77 per cent of GDP; beyond that level, public debt is unsustainable in the economy.

The current outstanding debt stock is the resulting of borrowing from the government, which is a specific indicator of fiscal policy, and it can be identified as the byproduct of the country's overall fiscal activities. Government borrowing can assist in the development of a country by providing more opportunities for public investment, so it can be defined as a virtuous force of the country. However, if it is not prudently controlled by the government, it becomes a vicious force of the economy, and it will create substantial problems for the entire society. A high level of debt servicing costs and a high public debt stock create different negative economic, social, and political impacts on the country.

1.2 Available literature and research problems[1]

Few studies have been conducted in Sri Lanka related to the public debt. Jha (2001) analysed the debt sustainability in low-income countries by using stationary and co- integration tests covering the period from 1950 to 1999. This paper found that, during that period, the fiscal situation was stable in Sri Lanka. Fonseka and Ranasinghe (2008) examined the debt sustainability in Sri Lanka, showing an increasing trend of public debt stock and debt servicing. They suggested that if the government would try to reduce the deficit by raising taxes, it would be an intolerable solution, and cutting down the capital expenditures would negatively impact the future growth prospects of the economy. Therefore, the authors recommended the elimination of waste and the reduction of government expenditures as a short-term solution to achieve high growth in the long run and eliminate this problem.

Perera and Verma (2008) analysed the sustainability of the trade deficit covering the period of 1950 to 2006. This paper identified the long-run relationship between exports and imports in Sri Lanka. The authors used unit root tests and co-integration techniques to endogenously determined structural breaks. The findings failed to support the existence of a long-run equilibrium between exports and imports in Sri Lanka and further explained the ineffectiveness of Sri Lanka's recent macroeconomic policies. Ekanayake (2011) analysed debt sustainability and identified which kind of macroeconomic variables affect the debt sustainability in Sri Lanka. The author mainly focusses on the debt-to-GDP ratio in the medium term. The structural vector auto-regression model was used to project the endogenous variables related to the debt dynamic, and the impulse response function and variance decomposition analysis were used to examine the joint dynamic impact of the structural shocks for macroeconomic variables. This paper concluded that 'one standard deviation of positive growth shock will result in a reduction in the debt-to-GDP ratio of 2.4 per cent by 2015'. Deyshappriya (2012) analysed the debt and fiscal sustainability in Sri Lanka using a time series dataset from 1990 to 2009. He applied the inter-temporal budget constraints approach to examine the debt and fiscal sustainability of Sri Lanka. In this regard, he employed the Augmented Dickey Fuller test, the Dickey Fuller test, and the Phillips– Perron test. He further applied the ordinary least squares method to examine the determinants of factors that impact an increase on the net total debt. This paper reveals that, during this period, fiscal policy was unsustainable in Sri Lanka. Furthermore, results show that the GDP growth rate, political instability, and budget deficit positively impact the increase in public debt in Sri Lanka. Therefore, he suggests improving the government revenue while decreasing expenditures to achieve fiscal sustainability. The author also strongly recommended improving the tax administration, introducing a new tax system, decreasing welfare expenditures

and defence costs, and reducing transfers to achieve debt and fiscal sustainability.

Cooray and Kumara (2013) analysed the public debt and economic growth in Sri Lanka using time series data from 1960 to 2010. This paper investigated the several issues related to public debt in Sri Lanka including the exact relationship between debt and economic growth (either positive or negative), the optimum or threshold rate of debt that minimises the economic cost of debt, the sustainable level of debt for Sri Lanka, and whether the Central Bank debt reduction target for 2016 was desirable. To investigate the above issues, the authors developed an econometric model based on conditional convergence and also used two-year non-overlapping averages to capture the short-run fluctuations and instrumental variables to analyse the endogeneity problem. This paper found that the exact relationship between the GDP per capita growth and public debt in Sri Lanka is nonlinear and also found that the threshold level of public debt in Sri Lanka is 59.42 per cent of GDP; above this level, public debt negatively impacts the GDP per capita growth. Those findings are strongly supported and justify the debt reduction target of the government to about 60 per cent by 2016.

Banda and Priyadarshani (2014) analysed the impact of government budget deficits on debt sustainability in Sri Lanka using annual time series data from 1960 to 2012. The authors used a novel methodological approach and government debt test by using the face value, market value, and discounted market value of government debt as a proportion of GDP. According to the results of Augmented Dickey Fuller and Phillips–Perron tests, the debt ratios are non-stationary, implying that the existence of debts is unsustainable. This paper's results show that the public debt in Sri Lanka is not sustainable. The authors suggest that transferring foreign debt to other sources of financing or reducing the deficit.

Many of these papers mentioned above focus only on economic aspects of the public debt in Sri Lanka. In addition, many of those papers have not taken the post-conflict situation into consideration. Policy makers need to have a comprehensive understanding of the public debt problem if they really wish to find relevant and effective policies for debt sustainability. Such an understanding of the public debt involves identifying causes and consequences (not only economic but also social and political) behind heavy debt loads. It is only through this comprehensive understanding that policy makers can make effective decisions and find a solution to the public debt problem of Sri Lanka. Therefore, in this paper, I will comprehensively analyse the public debt problem, identifying the causes and consequences of public debt, not only economic but also social and political, to fill the gap in the literature. Moreover, I will identify whether the public debt in Sri Lanka is sustainable by using an econometric model and provide some prudential recommendations to maintain fiscal sustainability in the long run in Sri Lanka to fill this void.

1.3 Research Objectives

Given the above background, the main purposes of the current study are:

(a) To critically examine debt problems of Sri Lanka in a holistic manner, taking into account the missing gaps in the literature;

(b) To undertake an in-depth survey of empirical and theoretical literature in and out of Sri Lanka with a view to educate policy makers with the latest literature;

(c) To construct a disaggregated econometric model covering all aspect of the debt problem in Sri Lanka with a view to identify causes and consequences of public debt.

(d) To use the estimated model for various scenarios and policy analyses and forecasting; and

(e) To propose effective policies for sustainable debt.

1.4 Methodology and Framework

In order to achieve the above objectives, the author uses various quantitative and qualitative methodologies (mixed research) when and where it is most needed. The author uses different kinds of sources to collect the information including published research reports, literature reviews, official documents, and trade indicators. The data were collected from different sources such as governmental agencies, international organisations, and private organisations (International Monetary Fund, World Bank database, United Nations database, and other NGOs). Those data were analysed with quantitative techniques.

1.5 Research Outline

1. Chapter one: Introduction
   1.1 Background
   1.2 Research Problems
   1.3 Research Objectives
   1.4 Research Methodology
   1.5 Research Outline

2. Chapter Two: Literature Survey - Theoretical and Empirical Aspect of Debt Problem

This chapter provides theoretical and empirical evidence for public debt sustainability, including that related to low income countries, developing countries, and developed countries. Moreover, it identifies theoretical and empirical evidence related to public debt sustainability for different economies as well as its consequences.

2.1 Literature Survey - Theoretical Aspect of Debt Problem

2.2 Literature Survey - Empirical Aspect of Debt Problem

3. Chapter Three: An Overview of the Public Debt Problem in Sri Lanka

Chapter three attempts to provide a detailed overview of the public debt problem in Sri Lanka with the goal of providing an overall overview of public debt and some specific indicators related to the government debt and its sustainability. This chapter highly focusses on the theoretical background of this topic and provide some statistic data related to public debt in Sri Lanka. Furthermore, it explains the behaviours related to an overall budget deficit and method of financing the budget deficit of a country. Moreover, it explains the relative importance of domestic and external debt. Finally, it explains the government's fiscal operation.

3.1 Introduction
3.2 Budget Deficit and Public Debt Patterns in Sri Lanka
3.3 Composition of Public Debt
    3.3.1   Composition of Domestic Debt
    3.3.2   Composition of Foreign Debt
3.4 Government Debt Service Payment
3.5 Comparison with Regional Peers

4. Chapter Four: Causes and Consequences of the Public Debt of Sri Lanka

Chapter four aims to provide a comprehensive understanding of the public debt involving identifying causes and consequences (not only economic but also social and political) associated with heavy debt, because only through this comprehensive understanding can policy makers make effective decisions and find a solution to the public debt problem in Sri Lanka.

4.1 Identifying the Causes Behind the Heavy Debt Stock of Sri Lanka

4.2 Identifying the Consequences of the Heavy Debt Stock of Sri Lanka

    4.2.1   Negative Economic Impacts on the Country

    4.2.2   Negative Social Impacts on the Country

    4.2.3   Negative Political Impacts on the Country

5.   Chapter Five: The Crowding-out Effect of Sri Lanka

This chapter attempts to identify some theoretical models of the crowding-out effect as well as its behaviours with the objective of analysing the crowding-out effect in Sri Lanka and providing some policy recommendations. Furthermore, it identifies theoretical and empirical evidence related to the crowding-out effect for different economies as well as its consequences.

  5.1 Introduction

  5.2 Literature Review

  5.3 Data

  5.4 Methodology

  5.5 Estimated Results

  5.6 Findings and Policy Recommendation

6   Chapter Six: Public Debt sustainability in Sri Lanka

This chapter mainly attempts to identify whether the public debt is sustainable in Sri Lanka. Furthermore, it provides detailed theoretical approaches and concepts related to debt sustainability with a goal of providing a basic procedure for undertaking a debt sustainability analysis. Moreover, this chapter provides theoretical concepts of how to define debt, measure sustainability level, and determine implications and consequences of the high debt stock of a country.

6.1 Introduction

Chapter Two
Literature Survey – Empirical and Theoretical Aspects of Debt Problems

2.1 Introduction

Debt sustainability is the one of the main problems faced by both middle- countries and low-income countries, and it has played a major role in macroeconomic policies. Therefore, most policy makers and macroeconomists are greatly concerned about the level of debt that is sustainable for different economies. Many of the studies about debt sustainability have been jointly conducted by the World Bank and the IMF. Most countries' fiscal sustainability has been examined using different approaches. I divided this chapter into three sections. The first section provides an empirical and theoretical literature survey regarding Sri Lanka, the second section explains the theoretical literature inside and outside of Sri Lanka, and the third section explains the empirical literature from both inside and outside of Sri Lanka.

2.2 Literature Survey—Sri Lankan Experience of the Empirical and Theoretical Aspect of Public Debt Sustainability

Few studies have been conducted in Sri Lanka related to the public debt. Jha (2001) analysed the debt sustainability in low-income countries using stationary and co- integration tests covering the period from 1950 to 1999. This paper found that, during this period, the fiscal situation was stable in Sri Lanka. Fonseka and Ranasinghe (2008) analysed the debt sustainability in Sri Lanka and also showed an increasing trend of public debt stock and debt servicing in Sri Lanka. They suggest that the government trying to reduce the deficit by raising taxes is an intolerable

solution and that cutting down the capital expenditure negatively impacts the future growth prospects of the economy. Therefore, they recommended the elimination of the waste and reduction of government expenditures as short-term solutions while achieving a high growth in the long run and eliminating this problem. Perera and Verma (2008) analysed the sustainability of trade deficit covering the period of 1950 to 2006. This paper identifies the long run relationship between export and import in Sri Lanka. This paper identified the long-run relationship between exports and imports in Sri Lanka. The authors used unit root tests and co-integration techniques to endogenously determined structural breaks. The findings failed to support the existence of a long-run equilibrium between exports and imports in Sri Lanka and further explained the ineffectiveness of Sri Lanka's recent macroeconomic policies. Ekanayake (2011) analysed debt sustainability and identified which kind of macroeconomic variables affect the debt sustainability in Sri Lanka. The author mainly focusses on the debt-to-GDP ratio in the medium term. The structural vector auto-regression model was used to project the endogenous variables related to the debt dynamic, and the impulse response function and variance decomposition analysis were used to examine the joint dynamic impact of the structural shocks for macroeconomic variables. This paper concluded that 'one standard deviation of positive growth shock will result in a reduction in the debt-to-GDP ratio of 2.4 per cent by 2015'. Deyshappriya (2012) analysed the debt and fiscal sustainability in Sri Lanka using a time series dataset from 1990 to 2009. He applied the inter-temporal budget constraints approach to examine the debt and fiscal sustainability of Sri Lanka. In this regard, he employed the Augmented Dickey Fuller test, the Dickey Fuller test, and the Phillips– Perron test. He further applied the ordinary least squares method to examine the determinants of factors that impact an increase on the net total debt. This paper reveals that, during this period, fiscal policy was

unsustainable in Sri Lanka. Furthermore, results show that the GDP growth rate, political instability, and budget deficit positively impact the increase in public debt in Sri Lanka. Therefore, he suggests improving the government revenue while decreasing expenditures to achieve fiscal sustainability. The author also strongly recommended improving the tax administration, introducing a new tax system, decreasing welfare expenditures and defense costs, and reducing transfers to achieve debt and fiscal sustainability.

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and discounted market value of government debt as a proportion of GDP. According to the results of Augmented Dickey Fuller and Phillips–Perron tests, the debt ratios are non-stationary, implying that the existence of debts is unsustainable. This paper's results show that the public debt in Sri Lanka is not sustainable. The authors suggest that transferring foreign debt to other sources of financing or reducing the deficit.

2.3 Literature Survey—Theoretical Aspect of Debt Sustainability

To maintain the public debt at a sustainable level, the future primary balance (the difference between the total government revenue and expenditures without interest payments) of the government should be sufficient to pay the debt obligations of the country. The researchers used different models and conducted a number of studies to estimate the sustainable level of debt.

Some researchers have used the general equilibrium model to estimate the debt sustainability of the country. Aiyagari and Mcgrattan (1998) developed a general equilibrium model to calculate the optimal level of risk-free public debt and the welfare costs of deviating from the optimum level. They also discussed the risks and benefits of public debt. This paper has mainly focused on the United States, but while doing so, it determined the optimal debt ratio of a closed economy.

When measuring fiscal sustainability, debt-to-GDP ratio is used as the key indicator (Blanchard, 1990, Buiter, 1985, Hagemann & Sartor, 1990, Huang & Xie, 2008, International Monetary Fund, 2013). However, there is no consensus about the fiscal sustainability threshold. Before adopting the euro as the currency, the Euro zone entered into the Growth Pact with a goal of 60% of debt-to-GDP ratio identified as the critical point for stability. However, this threshold level changes over time as well as by country or region. For example, after the financial crisis, this

ratio became weaker than before. If the debt-to-GDP ratio is higher, there is more of a possibility that the country may default. The International Monetary Fund (2013) shows that, among 55% of defaults, the debt-to-GDP ratio was below 60% before the default, and 35% of the defaults had a debt-to-GDP ratio below 40%.

The sustainability of debt is normally evaluated through calculating the government gross or net debt as a percentage of GDP. Government debt is sustainable when the debt-to-GDP ratio of that country is stable or decreases over time. There are two conceptual methods to calculate the sustainability of debt. The first is the accounting method, and the second is the Present Value Constraint method. The accounting method mainly uses the ratio of debt to GDP. Pasinetti (1998) and Goldstein (2003) show that a stable debt ratio can be managed over the long term and it is sustainable fiscal policy.

The IMF uses two frameworks for analysis of debt sustainability: the traditional analysis of debt sustainability and the new sustainability framework. Costa and Ramon (2005), using the traditional method, examined the medium- and long-term debt ratio using a baseline scenario. Under the baseline scenario, researchers assume the future primary balances of the government and some macroeconomic indicators such as the real GDP growth, inflation, real interest rate, and exchange rate to estimate the debt ratio. To estimate the trend of the debt ratio under the baseline projection, the debt level and structure are used to calculate the sustainable debt level. Thus, this traditional approach is highly dependent on the baseline scenario to explain the sustainable debt level.

The IMF's new approach uses the standard template method for the projection of debt, and it also considers the unexpected shocks faced by the economy by conducting stress tests that provide statical upper bounds when calculating the debt ratio.

The Overborrowing Hypothesis is used to determine the gravity of the existing debt of the country. This approach calculates the benchmark debt ratio and compares it with the current debt ratio. If the current debt ratio has exceeded the benchmark, it is considered overborrowing of the government. Under this approach, the benchmark debt level is calculated as follows:

$$d* \cong ps/(r-g) = \text{rev-pexs}/(\text{r-g})$$

d* is the benchmark debt level, ps is the constant primary surplus as a percentage of expected GDP in the future, r is the real interest rate, and g is the economic growth. The primary surplus is the difference between the average total revenue ratio and the average primary expenditure ratio in a specific period. The benchmark debt ratio is calculated as expected primary surpluses (present value) as a percentage of the GDP.

Mendoza and Oviedo (2004) developed the Natural Debt Hypothesis, which estimates the tolerable debt ratio in a crisis situation. If the primary balance of the country continues at a low value, it is considered to be an upper bound on the debt level. The upper bound of the debt ratio represents the Natural Debt Limit (NDL). This model explains the shocks that encourage the government to continue its spending at a minimum level to maintain an indebtedness at a tolerable level in a crisis situation. If a country's debt ratio is lower than the NDL, the government increases the debt ratio to cover the primary expenditures. If the debt ratio is lower than the NDL in a specific period, the government increases it to raise the primary expenditures. If the debt ratio is equal to the NDL, the primary expenditure should be reduced to the minimum level.

Calomagno, Egger, and Sicilia (2008) mainly used the Structural VAR model to measure the interrelationship between different endogenous variables such as exchange rate, interest rate,

and growth rate, and their data were based on the Uruguayan economy. The authors used the impulse response function to measure the combined impact of different shocks to the debt dynamics. This also revealed the joint dynamic effect of structural innovations between endogenous variables and the debt-to-GDP ratio.

Celasun, Debrun, and Ostry (2007) developed a probabilistic approach using fan charts to estimate the debt sustainability in an open economy. This model was developed to estimate the combined impact of shocks to endogenous variables of debt dynamics, and it was applied to Brazil, Mexico, Argentina, South Africa, and Turkey. There are three steps in the simulation algorithm. The first is the fiscal reaction function, which describes the estimated average fiscal policy pattern of the economies. The second is the estimate of the unrestricted Vector Auto Regression (VAR) to capture the statistical properties of nonfiscal variables such as growth rate, interest rate, and exchange rate. The third calculates the corresponding debt path using the fiscal reaction function. This approach gives the largest number of possible debt paths with different shocks.

Frank and Ley (2009) presented some modifications to the probabilistic approach developed by Celasun, Debrun, and Ostry (2007), calling it the Markov-Switching Structural Vector Auto Regression (SVAR). Some differences can be found from the original model: They used the bootstrapping technique because the behaviour of the variables is asymmetric and there are thick tails. Instead of calculating a fiscal reaction model, they used the debt stabilising balance to find a baseline projection.

Anderson, Silva, and Velanadia-Rubiano (2011) explain the reasons behind the 24 emerging market economies that manage their economies successfully as compared to the developed economies during the global financial crisis. The global financial crisis of 2008/2009 had a less

severe impact on the Asia and Pacific regions' economies compared to that on those of developed economies because the Asia-Pacific economies had implemented sound macroeconomic fundamentals prior to the global financial crisis. Many of the emerging market economies used good monetary and fiscal management strategies such as a diversified debt portfolio, increasing the maturities of debt, and reducing the share of external debt prior to the global financial crisis. They improved their overall debt management capacities considerably in the decade prior to the global financial crisis. The continual receipt of multilateral aid also helped the emerging economies to reach this standard level.

2.4 Literature Survey—Empirical Aspects of the Debt Sustainability

Silika and Friedrich (2006) examined public debt sustainability by applying a panel co- integration analysis of 15 European Union member countries from 1970 to 2004. They used this method to test for a unit root of the public debt-to-GDP ratio in the individual countries, and results show that the public debt-to-GDP ratio has a different stationary value among ten European Union member countries. Furthermore, the panel co-integration results indicated that there was strong evidence of co-integration between the primary budget and the debt-to-GDP ratio among six European Union countries. The results showed the public debt sustainability among the selected European Union countries during that period.

Fincke and Greiner (2012) applied the method proposed by Bohn (1998) to analyse the public debt sustainability in selected European countries over a 30-year period. The estimated results showed that the public debt was sustainable among the selected countries because they were maintaining effective fiscal policies.

Chandia and Javid (2013) conducted a detailed empirical analysis to estimate the public debt sustainability of Pakistan from 1971 to 2008. The authors used the fiscal reaction function

presented by Bohn (1998), and results indicated that there was a weak and positive relationship between the surplus-to-GDP ratio and the lag debt-to-GDP ratio using the VAR model. The results confirmed that public debt was unsustainable during this period in Pakistan.

Ozkaya (2013) analysed public debt sustainability by using quarterly data from 1999 to 2010 in selected OECD countries. The study re-examined the three different motives related to public debt by using a step-wise econometric test procedure. The results of the study proved that the four OECD countries (Ireland, Spain, Greece, and Portugal) used unsustainable debt policies and the other four countries (France, Poland, Italy, and Turkey) followed sustainable debt policies during the specified period. The most valuable contribution of this study is that it conducted a detailed analysis of long-term debt sustainability by developing a step-wise econometric test procedure.

Pradhan (2014) examined public debt sustainability in India using the co-integration and error correction mechanism. The study results proved that the public debt in India was sustainable during that period, and the author also suggested that the public debt ratio of India would not automatically decrease and that the government should implement some fiscal corrections to overcome this problem.

Benedicat and colleagues analysed the sustainability and determinants of the external debt of the Nigeria using Johansen co-integration and the error correction mechanism from 1986 to 2010. The co-integration test results showed the long-term relationship between the external debt and the other selected explanatory variables of debt servicing, GDP, and exchange rate. The estimated results show that the public debt was not sustainable in Nigeria based on terms of willingness and ability to pay, and the author also suggested that the government implement only the highest priority and most productive projects when using funds from external finances.

Chapter Three:
An Overview of the Public Debt Problem in Sri Lanka

3.1 Introduction

Sri Lanka faces a considerable problem, that is, the substantial budget deficits with high debt levels that have been maintained over the last thirty years. During that period, the government budget deficits have been around 7.5 per cent of the GDP, and the debt level has been 90 per cent of the GDP. In 1989, the highest government debt-to-GDP ratio in Sri Lanka was recorded, at 108.7 per cent. Because of the Sri Lankan revenue mobilisation, this ration continued to be below the total expenditure incurred by the government and was insufficient to cover even recurrent expenses. This created high budget deficits over the past several years that have forced the government to rely on debt to cover recurrent expenditures, which has resulted in the accumulation of the government debt stock (Central Bank of Sri Lanka, 2017, p. 192). If the government uses foreign funds for infrastructure projects that should generate goods and services that save money, they are importing expenditures and increasing exports to facilitate the repayment of debt.

High budget deficits and high debt levels create spillover effects to other sectors of the country as well as creating macroeconomic instability in a country. Therefore, the government should focus on holding debt at a sustainable level. However, this has become an important issue that consists of macroeconomic variables and requires a long-term solution to addressing the issue at the macro level. In order to achieve fiscal sustainability in Sri Lanka, policy makers should work to stabilise the debt-to-GDP ratio within a feasible range.

The high debt level of a country will create some negative implications. The government has to

pay a significant amount from its revenue as the outstanding debt and interest payments, which will create problems for the government to cover the other essential and development-oriented expenditures. It also leads to a decrease in resource availability for the private sector of the country. Furthermore, it increases the interest rate in the domestic market and increases the cost of borrowing for investors, creating a crowding-out effect in the economy. That negatively impacts the country's economic growth.

3.2 Budget Deficit and Public Debt Patterns in Sri Lanka

In 2017, the government debt was 77.6% of the GDP in Sri Lanka. That same ratio averaged to 69.69% from 1950 to 2017, with the highest recorded value of 108.7% in 1989 and the lowest of 16.30% in 1951. Continuous increases of fiscal deficit have impacted the accumulation of enormous public debt in Sri Lanka since 1950. Before 1950, Sri Lanka implemented liberal economic policies consisting of a low direct involvement of the government in economic activities and less intervention in exchange controls and foreign trade. However, in late 1950, economic activities started to be controlled through direct government intervention, which increased in 1960 because the economy was transferred to a semi-planned mixed economy. After 1977, Sri Lanka's economic policies were drastically changed due to the introduction of a market-oriented policy package consisting of less government involvement in the economy and the deregulation of market activities. In 1980, Sri Lanka implemented a liberalisation programme to become the most liberalised country in the South Asian region. The balance of payment deficits that started in late 1950 led to enormous foreign debt that further increased after 1978. The external debt drastically increased compared to the domestic debt, which highly impacts the economy with regard to the burden of the debt. Sri Lanka had experienced continued high budget deficits for several decades and implemented different policies under different

governments. Therefore, Sri Lanka has had a variety of experiences and witnessed the conducting of a series of contrasting developmental strategies since its independence. Even though the policies were different, the government has faced high budget deficits since 1960. The Central Bank data provided the total budget deficit as a percentage of GDP of 5.8 from 1958 to 1967, 6.1% from 1968 to 1977, 11.5% from 1978 to 1987, and 8.4% from 1988 to 1996. The following table shows the economic policy changes in Sri Lanka after independence:

Table 3.1: The economy policy changes in Sri Lanka after independence

Year	Policies Implemented in Sri Lanka
1948	The country gained independence and implemented economic policy regimes.
Early 1950	Pro-enterprise liberal economic policies (minimum intervention of foreign trade and exchange controls and minimum government involvement in economic activities) were implemented.
1960	Sri Lanka was transformed into a semi-planned mixed economy.
Early 1970	The economy was highly regulated and controlled.
1977	A market-oriented policy package (deregulation of the market activities and the reduction of direct government participation in the economy) was introduced.

The following graph shows the changes of the budget deficit and debt as a percentage of GDP from 1950 to 2018.

Figure 3. 1: Budget deficit and debt as a percentage of the GDP from 1950 to 2018
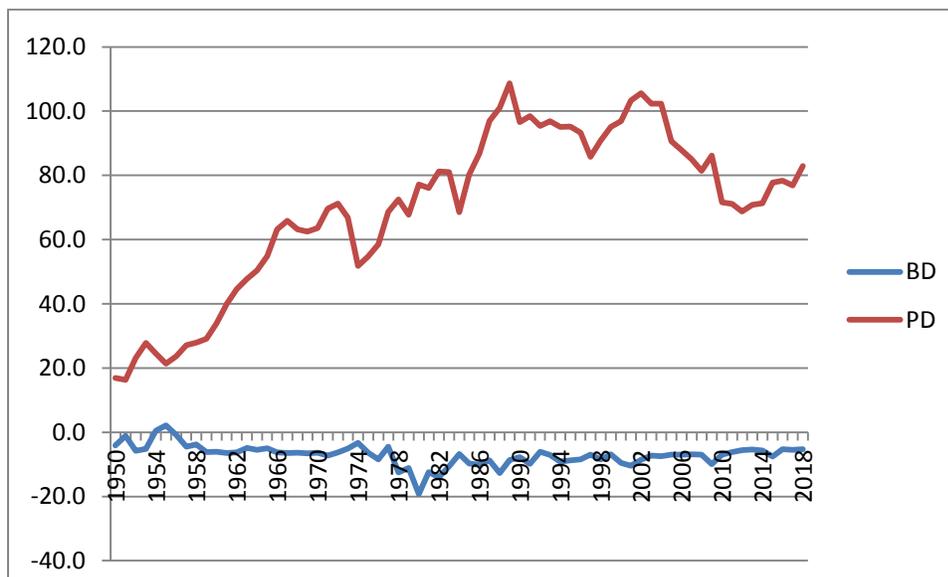
Source: Author's own calculations based on CBSL data.

According to Figure 1, Sri Lanka had a considerable amount of the budget deficit and a higher rate of debt as a percentage of GDP. During 1954 to 1955, the country faced small budget surpluses and during 1960 to 1970, the budget deficit averaged around 8%. After the 1977 increase, the budget deficit due to government revenues was insufficient to cover government expenditures. During the 1978 to 1986 period, the budget deficit increased to 15%. This budget deficit increases the impact of the increased foreign debt, which was around 62US$ in 1960 and 380US$ in 1974. After 1977, due to the fact that liberalisation policies released import restrictions, it was easier to get foreign credit than it had been in the past. In 1980, the foreign

debt increased because of depreciation of the Sri Lankan rupee compared to the currencies of the lending nations. At the end of 1986, the total external debt was estimated to be around 4US$ billion. In 1977, the public debt-to-GDP ratio was 69%, and it increased to 89% in 1998. In 2002, the total debt was approximately Rs.1,669,282 million, which was the highest recorded total debt in Sri Lankan history, and during this period, the debt-to-GDP ratio increased to 105.3% (domestic debt: 59.8%, foreign debt: 45.5%). After 2002, the public debt-to-GDP ratio decreased slowly, and in 2015, it was recorded at 76%. In 1950, domestic debt as a percentage of GDP was approximately 13.7%, and it was at its highest in 2002, at 60% of GDP. Sri Lanka rapidly increased the budget deficit and debt levels, especially after 1977. After 1983, this situation increased further because of the political instability of Sri Lanka. The continuously increasing deficit led to an increase in the borrowing of the country as well, resulting in the increase of the debt stock in Sri Lanka.

3.3 Composition of Public Debt

The public debt of Sri Lanka mostly consists of central government debt and it has been borrowed from both domestic and foreign sources.

Figure 3.2: Domestic Debt and Foreign Debt as a Percentage of GDP from 1950–2018
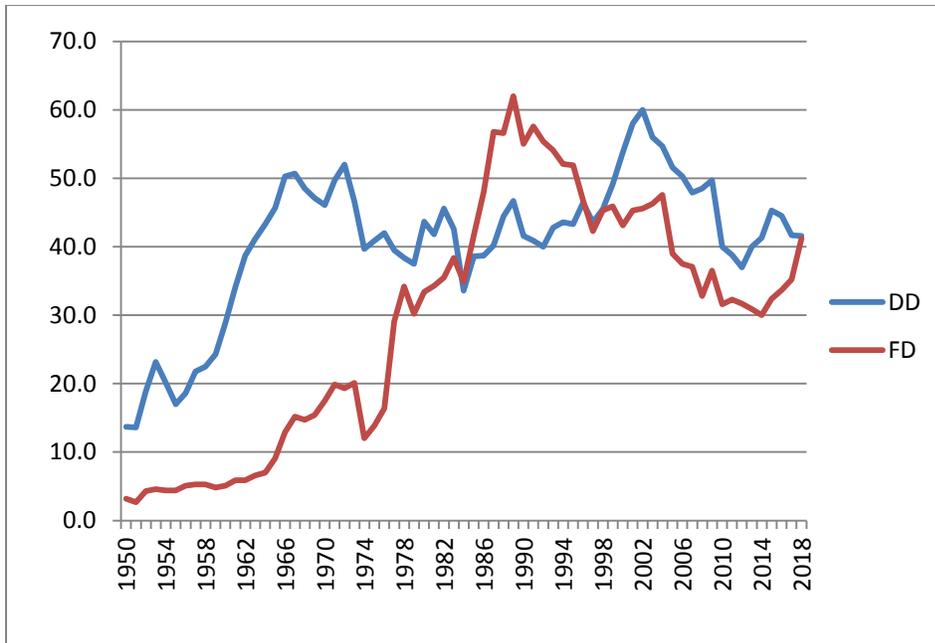
Source: Author's own calculations based on CBSL data.

Figure 2 reflects that, from 1950, government borrowing, from both the domestic and foreign sources, gradually increased. However, at the beginning of the 1990s, the growth of the borrowing from domestic sources to finance the budget deficit increased, but there was no significant gap between the domestic and foreign sources of total debt stock in Sri Lanka because the withdrawals from domestic loans was high compared to foreign sources. The declining trend of tax and non-tax income and the increasing trend of current expenditures led to an increase in the budget deficit of the country. Therefore, to cover the government expenditure and debt service payments, the government was motivated to seek new loans. Furthermore, the increasing trend of borrowing from domestic sources increased the interest rate and reduces the availability of loans going to private investment, which were crowded out of the economy.

In 2017, a large part of the budget was financed through foreign sources. From the overall budget deficit of Rs. 439.2 billion (59.9 per cent) was financed through the foreign sources and

Rs.294.3 (40.1 per cent) was financed through domestic sources. In 2017, the budget deficit through foreign sources increased because of the issue of the International Sovereign Bonds and the increase of the Foreign Currency Term Financing Facility. Financing of the budget deficit using foreign borrowings increased to Rs.439.2 billion (59.9%) in 2017 compared to Rs.392.9 billion (61.2%) in 2016. The net foreign financing included Rs.228.5 billion from ISBs, Rs.228.5 billion from FCTFF, Rs.43.7 billion of foreign investment in treasury bills, and Rs.779.0 million from foreign project loans. The Export-Import Bank of China, IDA, Asian Development Bank, and the Government of Japan were the main sources of foreign project financing in 2017. Financing the budget deficit through domestic sources relied more on banks than non-bank organizations in 2017. The total borrowing from banking sources was 187.7 billion (63.8%) in 2017 compared to 140.0 billion (56.%) in 2016.

3.3.1 Composition of Domestic Public Debt

The domestic public debt can be divided in different ways. One way it can be divided is into maturity periods. Maturity of domestic debt can be categorised as short term and medium and long term. The domestic short-term public debt consists of treasury bills (T-bills) and other short-term tools such as bank overdrafts. The public debt of the medium-to-long term consists of rupee securities and/or treasury bonds (T-bonds). Rupee securities have an issued interest rate that is administratively determined, and T-bills and T-bonds are issued via auctions with an interest rate determined by market forces. Rupee securities can be transferred via registration with the superintendent, while T-bills and T-bonds are transferable via delivery and endorsement. T-bills are issued in maturity periods of 91 days, 182 days, and 364 days. T-bonds are issued with maturity periods of 2 years to 20 years, and rupee securities are issued with maturity periods of

years to 30 years. Public debt can be divided into institutions such as banks and non-bank organisations. Another way domestic debt can be divided is by instruments: T-bills, Rupee loans, T-bonds, and others.

Figure 3.3: Composition of Domestic Debt Divided by Instruments
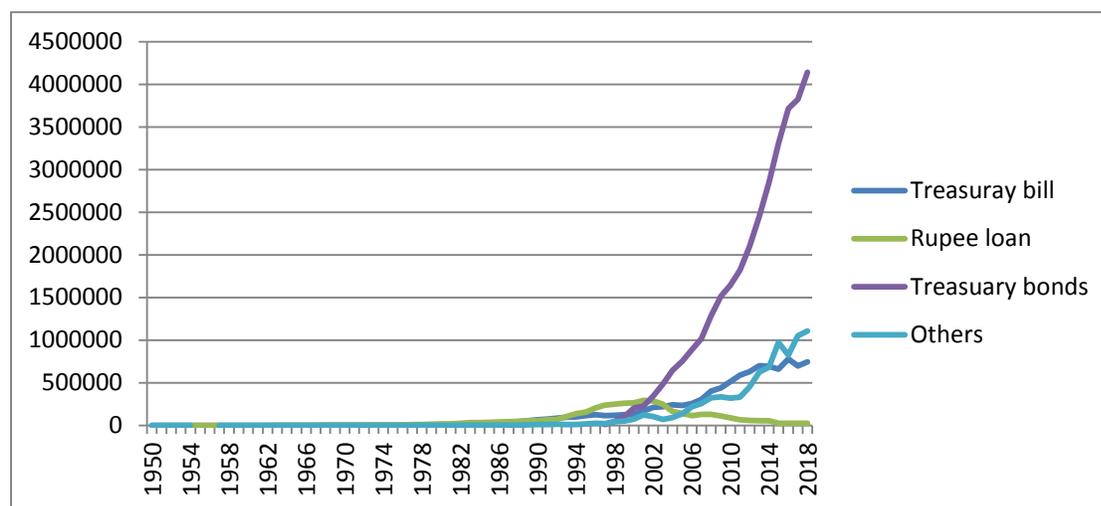
Table 3. 2: Features of the Major Domestic Debt Instruments in Sri Lanka

Feature	T-Bills	T-Bonds	Rupee Securities
Method of Issue	Auction	Auction	Tap system
Bidding	Electronic	Electronic	By application
Interest Rate Determination Method	Market	Market	Government
Method of Interest Payment	Upfront	Biannually	Biannually
Maturity Period	91, 182, or 364 days	2 years or more	2 years or more
Transferability	By endorsement and delivery	By endorsement and delivery	By registration
Primary Market	Primary dealers and institutional investors	Primary dealers and institutional investors	Any individual

Source: Public debt management and debt profile of Sri Lanka

3.3.2 Composition of Foreign Debt

Both bilateral countries and multilateral donor agencies grant external loans to Sri Lanka. In 1950, the external debt stock was recorded at Rs.0.125 billion, 3.20 per cent of the GDP. In 1955, both multilateral and bilateral donor agencies began to provide financial assistance to development projects in Sri Lanka. In 1959, the Sri Lankan government started to take loans from the World Bank, and in 1965, an aid group was established to provide financial assistance to Sri Lanka. This aid group's financial assistance increased the debt-to-GDP ratio to 62 per cent in 1989. Currently, many multilateral donors who provide financial assistance to Sri Lanka, in particular the World Bank, Asian Development Bank, European Investment Bank, OPEC Fund, and European Investment Bank, while Japan, China, South Korea, and India are the main bilateral donor countries.

Foreign debt can also be divided by type: concessional loans, non-concessional loans, and commercial loans.

Figure 3.4: Foreign Debt Composition by Type
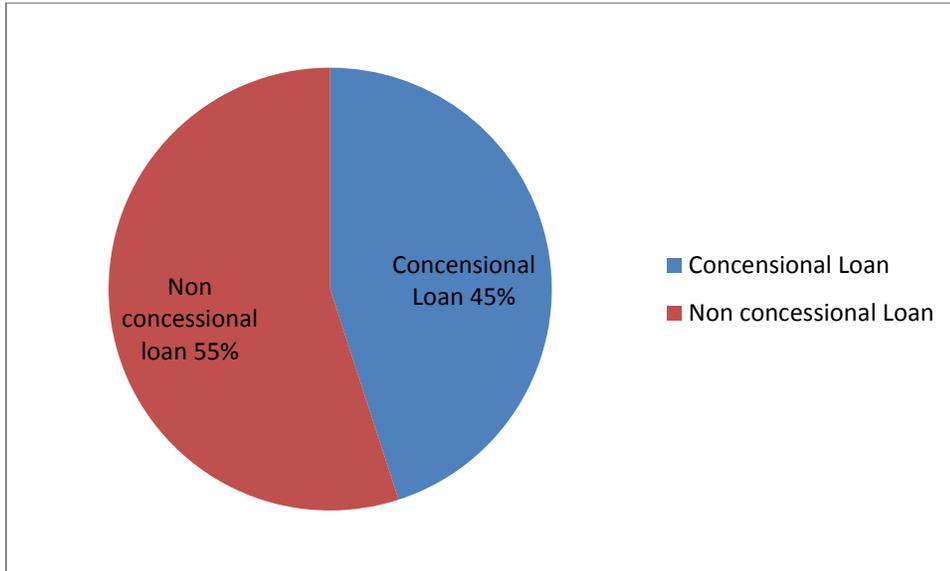
Source: Author's own calculations using CBSL data (2018).

In 2018, the foreign debt consisted of 55% non-concessional loans and 45% concessional loans. Concessional loans were obtained both from multilateral agencies (23%) and bilateral agencies (22%) in 2018. Non-concessional loans consist of international sovereign bonds (37%), other (10%), bilateral loans (4%), non-resident investments in T-bonds and T-bills (3%), and multilateral loans (1%).

Figure 3.5: Foreign Debt Composition by Currency

The government's foreign debt stock consisted of debt dominated by US dollars (63.5%), Special Drawing Rights (SDR) (16.0%), Japanese yen (10.5%), and euros (3.8%). Furthermore, the outstanding foreign debt stock increased by 963.2 billion mainly due to the depreciation of the Sri Lankan rupee against major foreign currencies.

3.3.3 Government Debt Service Payments

Debt service payments refer to the amount of money required to make payments towards the principal and interest payments on a loan. The total government debt service payments can be divided into two components - domestic and external. Both are liabilities of the government and must be paid from the cash flow of the treasury. The government repayment of external debt must be repaid to the creditors in foreign currencies. Therefore, repayment of external debt creates two effects: liability for the domestic currency as well as of the country's foreign reserves.

Figure 3.6: Total interest payments for the public debt from 1990 to 2018
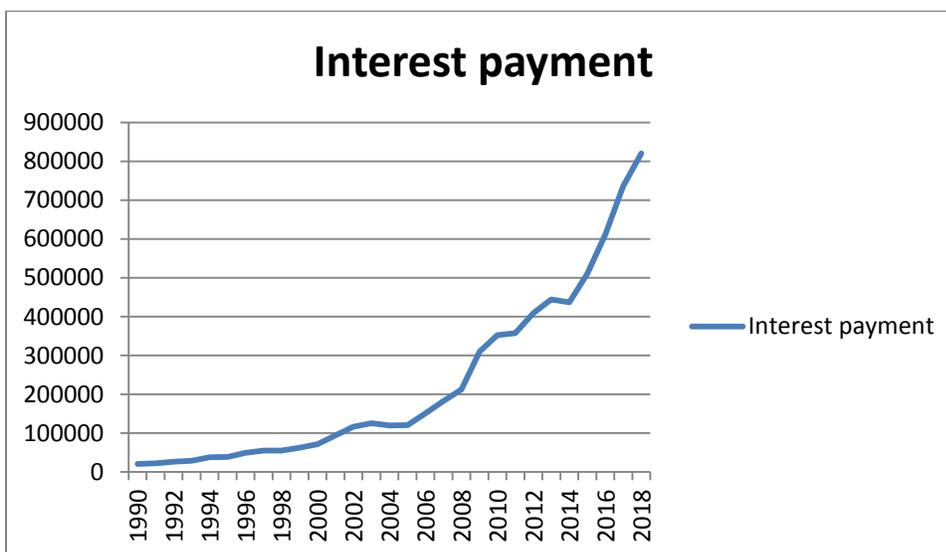
From 1997 to 2006, the government's total debt service payments increased from Rs. 84 billion to Rs.444 billion. Debt service payment as a percentage of government revenue increased from 50% to 93% within the 1997–2006 period in Sri Lanka. This was a remarkable increase ofdebt service payments, which were only sufficient for the repayment of revenue collected by the government. During the 2004–2006 period, the debt service payment slightly decreased because the inflation rate was reduced to a single digit between 2002 and 2003. This lower inflation rate helped to make the debt less expensive because of the lower interest rate of the economy. Furthermore, the government received debt cancellation and a debt moratorium because of the tsunami disaster that happened in December 2004. This helped the government to decrease the cash outflow by Rs.35 billion in 2005, and that reduced the government's borrowing requirements from the domestic market. It should be noted that in 2002, 2003, and 2009, the debt service payments increased more than the government revenue in Sri Lanka because during this period, there was a low revenue growth of the country and a higher interest rate for loans with shorter maturity periods. During these three years, the debt service payments as a percentage of government revenue were 105.72, 121.16 and 113.79 per cent, respectively. In the same years, the total interest costs as a percentage of government revenue were 43.32, 43.99, and 42.68 per cent.

3.4 Compared With Regional Peers

It is important to compare some essential fiscal indicators to those of regional peers.

Table 3.3: Comparative data about the overall budget deficit, current account deficit, and public debt of some selected South Asian countries (1997–2005).

Item	Sri Lanka	India	Pakistan	Bangladesh
Current a/c balance as a % of GDP Surplus	-3.1	-0.3	-0.3	-0.5
Overall budget deficit as a % of GDP	-8.8	-5.2	-4.9	-4.9
Public Debt as a % of GDP	97.5	57.3	69.3	69.3

Source: UNESAP (2006).

The above indicators show that Sri Lankan current a/c balance, overall budget deficit, and public debt as a percentage of GDP were unfavourably higher compared to select South Asian countries.

Chapter Four

Causes and Consequences of the Public Debt of Sri Lanka

Similar in many countries, most of the infrastructure projects of Sri Lanka are heavily dependent on foreign financing due to the low saving rate of the government (budget deficit), private sector low savings, and the external sector deficit. Therefore, to achieve the capital requirements of the economy, the government should take the debt from external markets or domestic markets to fulfil the many infrastructure projects. Moreover, many factors that increase the public debt in Sri Lanka (in particular, the terrorist war of recent decades, the declining trend of the government tax revenue, the increase in government expenditures, the decline in the official development assistance from donor countries, and the poor debt management system in Sri Lanka). In this chapter, I provide a detailed analysis of the causes behind and consequences for the heavy debt problem in Sri Lanka.

4.1 Causes Behind the Heavy Public Debt of Sri Lanka

4.1.1 Government Revenue Is Insufficient to Cover its Recurrent Expenses (Continuous Budget Deficit).

One major factor that impacts the heavy debt problem in Sri Lanka is the continuous deficit in the current account balances of the past 20 years. The following tables show some statistics related to the country's public finances, including most of the facts impacting the continuous increase in the government deficit. First, we can identify the waste expenditure of the administrative bodies of Sri Lanka.

- **Waste Expenditures of the Administrative Bodies of Sri Lanka**

Many economic reviewers have highlighted the fact that the waste and malpractices of the Sri Lankan administrative bodies are significantly increasing. The Committee on Public Enterprise and Public Accounts Committee have continually reported on the waste and malpractices in statutory bodies in Sri Lanka. However, legal actions are not strong enough to bring the offenders to court. The Global Competitiveness Report is also highly concerned about the problem of government waste.

Table 4.1: The global ranking of the waste of Sri Lanka

Year	No. of Countries in Sample	Rank of Sri Lanka
2003	102	n.a.
2004	104	62
2005	117	98
2006	125	85
2007	131	78

Source: Global Competitiveness Report, Fonseka and Ranasinghe (2008). *Sri Lankan Journal of Management.*

- **Highest Number of Ministries in Sri Lanka**

The highest number of ministries also increases the expenditures of the country. Globally, Sri Lanka has the most ministries, according to the 2001 Survey Statistic Data (on average, countries have 16 ministries). The survey also highlighted that developed countries maintained an amount similar to the world average.

Table 4.2: Average Number of Ministries in Different World Regions

Region/Country	No. of Ministries
African Region	22
Asian Region	20
Central and Eastern Europe	15
Latin America and the Caribbean Islands	15
Middle East and North Africa	20
Pacific Region	10
OECD Countries	14
World Average	**16**
Sri Lanka	**44**

Source: S. Sachao-Campo Sundaram (2001, p. 789), Fonseka and Ranasinghe (2008): *Sri Lankan Journal of Management*

- **Declining Trend of Government Revenues**

Government revenues mainly consist of government tax and non-tax revenues. The tax revenue is the most important, because it made up 87% of the total revenue in 2017 (Central Bank of (Sri Lanaka, 2017)). There are many reasons for the decline in this revenue. One reason is that the Sri Lankan tax base is narrow. The Inland Revenue Department of Sri Lanka currently maintains only 300,000 tax files, and some professional people such as doctors and lawyers do not pay taxes. Moreover, most people are actually required to pay taxes, but they evade paying taxes, and some people are underpaying. Furthermore, some industries currently enjoy tax

concessions under different agreements and laws.

4.1.2 Insufficient Monetary Procedures and Fiscal Discipline for Debt Management

Continued accumulations of public debt in Sri Lanka have increased the public debt stock and make it enormously difficult to service this debt because the Sri Lankan government has heavily borrowed from bilateral agencies, multilateral agencies, and international capital market with higher interest rates in order to invest in their mass development projects. Therefore, a sufficient monetary procedure for debt management has become a major policy goal not only for Sri Lanka but also for all the multinational lending agencies and donor countries. Therefore, increasing the requirements of the effective debt management system, includes the need for a transparent institutional framework procedure for debt as well as a significant procedure for monitoring public debt and deficit indicators for the medium and long term. Furthermore, debt management is also more important for policy makers so that they can identify the threshold level of debt for the country. The World Bank and International Monetary Fund provide guidelines for public debt management consisting of an effective governance structure for public debt management.

Fiscal discipline is the most important criteria for the accomplishment of the overall macroeconomic stability of a country. It gives the flexibility necessary for an effective and independent monetary policy implementation, and the lack of fiscal discipline creates many problems with the economy such as fiscal dominance and a weak or ineffective monetary policy to achieve price stability. Therefore, to meet this target, fiscal authorities have established numerical targets for fiscal outcomes such as the government budget deficit, expenditure,

revenue, and debt. These fiscal rules are essential to ensure that the country's budgetary operation aims to achieve long-term fiscal sustainability and solvency. Fiscal rules can be divided into four types: the debt rule, budget balance rule, expenditure rule, and revenue rule. The debt rule includes the target of public debt as a percentage of GDP, while the budget balance rule is established to achieve the rule that government expenditure cannot exceed its revenue. The expenditure rule establishes some limits of current and total spending. The revenue rule aims to improve the revenue collection and avoid the excessive tax burden (Central Bank of Sri Lanka, 2017). The lack of such sufficient monetary procedures and fiscal discipline highly impacts the accumulation of heavy debt in Sri Lanka.

4.1.3 Over borrowing by Recent Governments Exceeding the Benchmark Level

Most recent governments have conducted mass projects using borrowed money and have continually increased the public debt, which has become a major concern about the economy in recent years. In 2012 and 2013, public debt settled down to 79.1 and 78.3 per cent of GDP, respectively; it settled to around 80% of GDP (CBSL Annual Report, 2012). Most economists warned policy makers against exceeding these benchmark levels of public debt in Sri Lanka, because exceeding the benchmark level of public debt adversely impacts the economic growth through various channels of the economy such as inflation, interest rate, consumption, private investment, and financial development.

Because of these adverse consequences of high debt level, the IMF and World Bank have established certain threshold ranges for debt sustainability. However, Sri Lanka has not been able to meet these targets establish by the IMF and World Bank; all the indicators are over the upper limits of the threshold (Table 1).

Table 4.3: Threshold Level and Applicable Value for Sri Lanka related to the Indicators of Debt Sustainability

Ratio	Threshold Level (%)	Applicable Values for Sri Lanka (%)
Domestic Debt Service/Revenue	28–63	80
Total Debt Service/Revenue	40–63	93
Interest Payments/Revenue	4.6–6.8	32
Total Debt/GDP	33–60	93
Total Debt/Revenue	92–167	546

Sustainability of Sri Lanka's Public Debt. Fonseka, A.T., Ranasingha,S.S, (2008) Source: Debt Relief International, 2004.

Therefore, policy makers and international agencies have warned the government that if this situation continues, it will create a large debt trap and it will be difficult to obtain external and domestic loans at a reasonable cost.

4.1.4 Since Sri Lanka Graduated from a Low-Income to a Lower-Middle-Income Country, It Has Been Experiencing a Reduction in Official Development Assistance

Over the last decade, Sri Lanka achieved impressive economic growth (6.4% on average), and it was above its regional peers, reaching a per capita income of USD 2000 and USD 3000. This has led to reduced unemployment and poverty levels in Sri Lanka (CBSL Annual Report, 2010). Those factors upgraded Sri Lanka to the category of lower-middle-income country from low-income country in 2010. After moving up in the category, the country has been experiencing a

reduction in Official Development Assistance. Therefore, Sri Lanka is motivated to finance its public investment through commercial borrowings or issue bonds into the international market rather than getting money from grants. Before this situation, the government received considerable funds from many bilateral and multilateral donors as concessionary loans or grants. Being categorized as low income favorably impacts the economy because governments can obtain grants or loans at a lower interest rate. However, being recategorised changed the situation, and loans were only available at a higher interest rate. Moreover, the reduction of Official Development Assistance substantially impacted the increase in public debt stock in Sri Lanka in recent years.

4.1.5 Depreciation of Sri Lankan Rupee Compared to the Currencies of Donor Agencies

If the government issues bonds in the international market, it is vital to consider the exchange rate because fluctuations could cause considerable problems with regard to prediction of the risk of an international loan. This factor has substantially impacted Sri Lanka because recently, Sri Lankan rupees have continuously depreciated compared to the currencies of donor agencies. This has led to an increase in the debt burden of the country. The depreciation of the Sri Lankan rupee compared to the major foreign currencies increased the total debt stock to Rs. 225.2 billion at the end 2017. The Sri Lankan rupee depreciated by two per cent against the US dollar, 5.1 per cent against the Japanese yen, 7.5 per cent against the Indian rupee, 7.5 per cent against SDR, 10.5 per cent against the pound sterling, and 13.5 per cent against the euro during 2017. Therefore, outstanding foreign debt stocks increased by Rs.211.9 billion, mainly due to the depreciation of the Sri Lankan rupee against the foreign currencies; Other loans increase by

13.4 billion due to the depreciation of the Sri Lankan rupee against the US dollar, as domestic debt stock is denominated in this foreign currency (Central Bank of Sri Lanka, 2017).

4.1.6 Sri Lankan Government Borrowing at High (or Commercial) Interest Rate

Kappagoda (2004) shows that during 1992–2001, Sri Lanka was in a less-indebted category in terms of external debt. The reasons behind this favorable situation is that most bilateral and multilateral donors granted concessionary loans and many funds were received as grants during that period; these concessionary loans granted an average interest rate of 1.9–3.8 per cent. However, this position has changed, and the World Bank and International Monetary Fund have categorised Sri Lanka as a moderately indebted country. The Sri Lankan government obtains foreign loans to develop infrastructure projects, and the economic benefits depend on several factors: the terms and conditions of the loans, interest rates, and payback periods. If a loan has a low interest rate and long payback period, it creates more economic benefits than does a loan with a higher interest rate and low payback period.

4.1.7 After Prolonged Conflict, the Government Commenced Many Infrastructure Projects Using Foreign Debt

After prolonged conflict ended in 2009, the government, targeting a high growth rate, began many infrastructure projects using foreign debt. Many of those projects, however, have not produced the expected high returns as many were politically motivated.

4.1.7 The Impact of the Global Financial Crisis

Most countries focussed on attaining debt sustainability, as achieving fiscal sustainability is critical. The global financial crisis that adversely impacted achieving fiscal sustainability, which became an enormous challenge because most countries faced high fiscal deficits to cover public expenditures, resulting in higher indebtedness. In October 2010, the International Monetary Fund Staff published the World Economic Outlook shows how the economics had changed with regard to PPP-weighted GDP before and after the global crisis. In advanced economies, the PPP-weighted GDP was around 1.1 per cent before the crisis, and it became 8.8% in 2009.

Table 4.4: The economics had changed with regard to PPP-weighted GDP before and after the global crisis.

	2007	2008	2009
Advanced Economies (-) Deficit (+) Surplus	-1.07	-3.65	 -8.80
Emerging and Developing Economies (-) Deficit (+) Surplus 0.53		-0.11	-4.47
Developing Asia (-) Deficit (+) Surplus -8.3		-2.25	-4.67

Source: International Monetary Fund (October 2010). World Economic Outlook Database.

After the global crisis in 2009, the fiscal deficit was 9.9 per cent of the GDP, that is, the highest level of fiscal deficit recorded in the last two decades.

4.2 Implications of the Heavy Debt of Sri Lanka

The current outstanding debt stock is a result of borrowing from the government, which is one of the specific indicators of the fiscal policy, and it can be identified as the by-product of the country's overall fiscal activities. Government borrowing is used more for assisting in the development of countries by providing more opportunities for public investment, so it can be defined as a virtuous force of the country. However, if it is not pr

udently controlled by the government, it becomes a vicious force of the economy and it will create considerable problems for the entire society. A high level of debt servicing costs and a high public debt stock creates different negative economic, social, and political impacts on the country.

4.2.1 Negative Economic Impacts on the Country
4.2.1.1 Negative impacts of the Economic Growth of the Country

Most empirical studies have shown that debt has a positive relationship with growth only up to a certain threshold level; after that level, debt negatively impacts growth and most policy makers are motivated to estimate the other negative consequences of large debts of a countries. There is no doubt that an enormous debt stock negatively impacts a country's economic growth. Policy makers should identify the sustainable debt level in a country and the point at which it

negatively impacts growth; the optimal debt level must be understood in order to minimise the negative consequences of a country's debt.

4.2.1.2 Reduce the Private Investment in the Country

Public debt consists of external debt and domestic debt, meaning that the government can recover its debt through an external market such as from bilateral agencies, multilateral agencies, or international capital markets, or it can recover the debt from domestic market such as by issuing T-bills or T-bonds or from domestic financial institutions. If the government recovers its debt through a domestic market fund, this reduces the fund supply for domestic investors, which leads to a reduction of private investments in the country. Moreover, this increases the interest rate in the local market, which increases the cost of borrowing by the private sector. Increasing borrowing costs leads to a crowding-out effect, which negative impacts economic growth.

The Ricardian Equivalence refers to a situation when a country has high indebtedness and investors do not have incentives to invest in those countries. It emphasises that this situation will discourage investment and economic growth. In the medium term it has perverse impacts on debt sustainability (Roubini, 2001).

4.2.1.3 Reducing the Effectiveness of the Monetary and Fiscal Policy of the Country

If a country has a high debt stock, it will face a reduction in its monetary authority to increase the interest rate for monetary purposes because such actions will impact the debt and the deficit of the country.

4.2.1.4 Expectation of Increasing Taxes on the Economy

To recover higher debt service costs, the government tends to increase future taxes.

4.2.1.5 High Indebtedness Can Lead the Country Towards a Severe Crisis

Most worst case scenarios of high indebtedness show that it will lead to financial and other crises such as what was experienced in Brazil, Argentina, the USA, and the Euro zone. Debt sustainability has become a majorly discussed topic among policy makers because of the advanced consequences of the debt crisis and global economic recession as felt in the USA and the Euro zone.

4.2.1.6 Reduction in Credit Rating in the Country

High debt stock reduces the credit rate of the country. This will increase the interest rates of new debt in the future.

4.2.2 Negative Social Impacts on the Country

4.2.2.1 Reducing Social Welfare Services

Most of the poorest countries and developing countries allocate considerable money from the government budget annually to pay to service their debts. This money takes away from investments that could benefit ordinary people of the country. Thus, it reduces the necessary social welfare services that should be provided by the government. This becomes a major problem for most developing countries because the government cuts necessary welfare services such as health services, education services, public transportation services, and other social services. Oxfam International's 1997 report shows that the 'debt repayments have meant health centres without drugs and trained staff, schools without basic teaching equipment, and the collapse of agricultural extension services'. If the government increases borrowing and increases

the financial debt burden, that leads to the reduction of budgetary allocation for health, education, housing, and so on. This creates some social problems such as poor education, worse health facilities, and inferior housing.

4.2.2.2   Burdens on Future Generations

If the country maintains a high debt stock, this impacts many of the resources used for payment of foreign borrowing and repayment of foreign debt service costs, which leads to burdens on future generations.

4.2.3   Negative Political Impacts on the Country

4.2.3.1 Conditions that Apply to the IMF and World Bank Loans (Structural Adjustment Programs)

Countries must adopt Structural Adjustment Programs to qualify for the loans granted by the IMF and World Bank. Most of these programs are unsuccessful or do not match the developing country's economy; therefore, in the long run, this can create some socioeconomic and political problems in these countries.

CHAPTER FIVE
The Crowding-Out Effect of Public Borrowing in Sri Lanka

5.1 Introduction

Sri Lanka has maintained enormous budget deficits over the last thirty years, which has created high levels of debt. During that period, the Sri Lankan government's budget deficits have been about 7.5 per cent of the country's GDP, and the debt level has reached about 90 per cent of its GDP (Central Bank of Sri Lanka, 2017). The Sri Lankan revenue mobilisation has remained lower than the government's total expenditures; revenues have not been enough to even cover recurrent expenses. This situation has created high budget deficits over the past years and forced the government to rely on debt to finance its recurrent expenditures, which in turn has led the government to accumulate an enormous debt stock (Central Bank of Sri Lanka, 2017, p. 192). Large budget deficits and high debt levels may have created a crowding-out effect on the economy as well as macroeconomic instability. Researchers have presented different views about the relationship between public and private investment. Some researchers have shown that public borrowing from domestic sources (internal sources) crowds out private investment in the country. They argue that, *ceteris paribus*, large-scale public borrowing results in higher prices for the private sector, which is sensitive to interest rates. This leads to reduced investment due to lower rates of return; that is, the private sector is crowded out. Other researchers, however, have demonstrated that public borrowing produces a crowding-in effect on private investment. The crowding-in effect also originates from government deficit spending. However, such an effect is highly dependent on whether the spending increases economic activity. An increase in economic activity creates more opportunities for businesses and increases the profitability of business operations. Therefore, the private sector crowd-in effect can lead to improvements in consumer satisfaction. For example, government investment in

infrastructure facilities such as highways, roads, and power plants, as well as spending on education and health care, may create a complementary impact on private investment by raising marginal productivity.

Many researchers, however, assert that loose fiscal policy crowds out private investment. Chhibber and van Wijnbergen (1988), Akkina and Celebi (2002), and Temin and Voth (2005) find evidence of a crowding-out effect that leads to reduced private investment. Conversely, Ramirez (1994), Hyder (2001), Naqvi (2002), Ouattara (2004), Chakraborty (2006), and Majumder (2007) conclude that public investment has a positive impact on the expectations of investors, thereby creating a crowding-in effect. This type of government spending is said to help to develop infrastructure, which encourages private investment in the country. Aschauer (1989) revealed that public investment in the United States has a significant positive impact on private investment, especially when the public investment goes to infrastructure facilities that increase productivity. This reciprocal relationship between public and private investment was further proven by Greene and Villanueva (1991) and Blejer and Khan (1984). Finally, empirical investigations by Ahmed and Miller (2000), Cruz and Teixeira (1999), Atukeren (2005), and Erden and Holcombe (2005) on the crowding-out and crowding-in effects of public investment produced mixed results. In Sri Lanka, the government borrows from different internal sources to finance its budget deficit, such as the Central Bank of Sri Lanka as well as private and public banks, and the level of borrowing has reached alarming levels. This, in turn, will hamper the government's efforts to reduce the rates of inflation and poverty in the country. Otherwise, this excessive borrowing will create upwards pressure on the economy by increasing the circulation of money in the marketplace.

As discussed above, public investment is differing consequences of private investment. While

many papers analyse public investment's crowding-out effect on private investment, few such studies are relevant to the Sri Lankan context. Gupta (1992) conducted an empirical study to identify the crowding-out effect in ten Asian countries and revealed that the Ricardian Equivalence Theorem is rejected vis-à-vis India, Sri Lanka, Indonesia, and the Philippines. He also found evidence of crowding out in all of the Asian countries studied except India. Chowdhary (2004) conducted a test to estimate the possible impacts of fiscal actions in the five least-developed countries in South Asia. He concluded that the price effect seems to be negative in Sri Lanka, but that it is statistically insignificant. Therefore, we can conclude that the price effect has no noticeable impact on the interest rate. Banda and Pridarshaniee (2013) examined whether there is a crowding-out effect in Sri Lanka by using time series data from 1960 to 2007. To examine the impact of the budget deficit on private investment, the author used empirical tests based on the neoclassical flexible accelerator and Mundell-Fleming models. The results showed that there is an absence of a financial crowding-out effect in Sri Lanka as a result of fiscal expansions. However, there has been no research conducted in Sri Lanka using recent data. Furthermore, it may be argued that the main center of this study is internal public borrowing because the crowding-out effect is primarily generated by the use of domestic loan sources. Government borrowing from external sources does not impact internal funding and has little impact on private investment. The sources of domestic public financing that are directly relevant to the crowding-out effect include both bank and non-bank sources. However, the previous paper did not take this matter into account when estimating the crowding-out effect in Sri Lanka. Furthermore, a large body of literature has analysed the relationship between public and private investment, and the empirical findings of most such articles have provided mixed results. However, there has been limited research in developing and emerging market economies on the

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interaction between public and private investment, and the results likely change over time because of structural reforms such as the deregulation of the goods markets (domestic and foreign).

Given the above background, the main objective of this study is to investigate the relationship between public borrowing from domestic sources and private investment in Sri Lanka by estimating autoregressive distributed lag (ARDL) and VAR models using three independent variables. The paper is organised as follows. The second section provides an in-depth explanation of relevant literature. Empirical evidence of the crowding-out effect as well as its theoretical foundations are discussed. The third section analyses public and private investment in Sri Lanka. The fourth section provides model specifications and estimations. Section five analyses the estimated results, and finally, section sixth concludes the paper and provides policy recommendations.

5.2 Literature Review

According to the crowding-out theory, when a government increases its borrowing to finance increased expenditures, the private sector is crowded out due to higher interest rates. There is some controversy in modern macroeconomics with respect to this effect because scholars disagree about how financial market behaviour is affected by increased government borrowing. If the expanded borrowings result in higher interest rates due to increased demand for loanable funds, the private sector will face higher borrowing costs, leading to a reduction in private investment. When this occurs, we say that private investment is crowded out.

Moreover, capital investment and other interest-sensitive expenditures are also subject to the expansionary effects of government borrowings. Decreased capital investment by a business can reduce long-term economic growth. However, this crowding-out effect can be moderated by

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government expenditures on private-sector products for a multiplier effect. This stimulates fixed investments through the accelerator effect; in other words, private investment crowds in. This accelerator effect becomes more valuable when an economy is suffering from unused industrial capacity during periods of severe recession or depression. If the government finances its budget deficit by merely printing money, crowding out can be avoided. However, this could cause accelerating inflation in the economy.

The impact of public investment operates through various channels. However, most economists and researchers have focussed on its potential effect on interest rates. Private investment can be affected by public expenditures either directly (real crowding out) or indirectly (financial crowding out). Engen and Hubbard (2004) studied the magnitude of potential adverse effects depending on the degree to which government borrowing increases interest rates and/or decreases private credit. However, government investment does not contribute to an increase in government revenue or real GDP, which may create other problems such as public debt or inflation. Higher government spending creates upwards pressure on interest rates, which discourages private investment. Other than the potential inflationary impact of government spending, most of the economic literature focusses considerable attention on its crowding-out or crowding-in effect on private investment. For developing countries, several empirical studies have examined the strong, long-run relationship between public and private investment (Atukeren, 2005, Erden & Holcombe, 2006, Rashid, 2005). When the public sector borrows a substantial amount of money from domestic sources, it impacts the country's growth. In the case of Sri Lanka, the government must pay serious attention to how an increase in the growth rate can be an accomplishment.

Bahmani-Oskooee (1999) discussed how the aggregate effect of public borrowing on the

interest rate could be viewed from multiple perspectives. First, the neo-classical theory of interest rates explains that the financing of a government's budget deficit increases the supply of high-interest government bonds, which decreases private investment and creates a crowding-out effect. Second, the Keynesian theory asserts that expansionary fiscal policy causes little to no increase in interest rates and will cause a rise in incomes and output. Therefore, according to this theory, there is a crowding-in effect rather than crowding out (Aschauer, 1989). Third, the Ricardian Equivalence Theorem introduced by Barro (1974) posits that an increase in the deficit that is financed through fiscal spending will be matched by a rise in taxes in the future, so interest rates and private investment will experience no change.

However, if the private fixed investment is crowded out, that could negatively impact the long-term economic growth. This can be moderated if the borrowed funds are used to finance productive investment in the country, such as for education, research, and the like. However, this situation can be worsened if government investment is not productive or public money is wasted. This crowding-out effect is mainly seen on bank balance sheets. If a government obtains a one-dollar loan from a bank, the bank will have one less dollar to lend to the private sector. A bank's response to a large amount of public borrowing will be to optimally adjust its loan portfolio so that it is balanced along the risk–return spectrum.

When an economy is already in the situation of potential output, crowding out can create a severe situation for the economy. Under this situation, the expansionary fiscal policy of the government encourages price increases, which leads to increasing demand for money. This will cause higher interest rates and crowds out interest-sensitive spending. This can suppress market output, leaving no room for the accelerator effect. In an economy with full employment, any increase in government purchases can result in resources being taken away from the private

sector. That is sometimes identified as real crowding out (Albatel, 2003). Crowding out of another sort, called international crowding out, may occur because of the prevalence of floating exchange rates; this can be explained by the Mundell-Fleming model. This occurs when government borrowing leads to higher interest rates, which attract inflows of money in capital accounts from foreign financial markets. That leads to an appreciation of the foreign exchange rate and crowds out the domestic exports that are subject to floating exchange rates. This prevents the demand-promoting impacts of the government deficit, but there are no negative impacts on long-term economic growth.

5. 2.1 Empirical Results Related to the Crowding-out Effect

Chhibber and van Wijnbergen (1988) estimated results using Turkish data and showed that an enormous budget deficit financed by domestic sources results in a decline in private investment, which causes the real rate of interest to increase. They conclude that government-sector fixed investment has a substantial and negative effect on private fixed investment. Rossiter (2002) shows that public investment crowds out private investment, while public investment in structures has a weak crowding-in effect.

Temin and Voth (2005) argued that the process of analysing interest rates is basically misguided; they show that in eighteenth and early-nineteenth-century England, the private lending market was balanced through the quantity ratio. The authors analysed the data using a VAR model on amounts lent by Hoare's Bank and concluded that there was a substantial crowding out effect; that is, a 1% increase in debt led to a 1% decrease in private lending, significant at the 1% level.

5.2.2 Empirical Results Related to the Crowding-in Effect

Using data from Mexico, Ramirez (1994) shows that the impact of public investment is a crowding-in effect, not a crowding-out effect. Ouattara (2004) shows similar results by using Johansen co-integration techniques and a bounds test approach to estimate the long-run private investment function using data from Senegal.

Hyder (2001) estimated the crowding-out hypothesis in Pakistan using the vector error-correction method on gross domestic product, public investment, and private investment. The results show a complementary relationship between public and private investment. Naqvi (2002) estimated the relationship between public investment, economic growth, and private investment in Pakistan. The results show that government investment positively impacts private investments and that economic growth generates both public and private investments.

Chakraborty (2006) analysed real and financial crowding-out effects using an asymmetric VAR model in India. The results show that there is no evidence of direct crowding out of private investment by public investment and that there is a mutual relationship between these investments. Furthermore, it revealed that there is no evidence of a real crowding-out effect.

Majumder (2007) examined the crowding-out effect of public borrowing on private investment in Bangladesh. The author estimated the investment function by using government borrowing, the interest rate, and GDP. The long-run relationship was estimated using the unit root test, an error correction model, and a co-integration test. The results did not show any crowding-out effect; rather, they showed evidence of a crowding-in effect, although the results were somewhat ambiguous.

Most attention has been given to developing countries with high interest rates and a history of fiscal management. Mukhtar and Zakaria (2008) examined the relationship between interest rates and budget deficits in Pakistan from 1960 to 2005. The authors conclude that government

budget deficits do not significantly impact the nominal or real interest rate in Pakistan. Moreover, Pandit (2005) investigated the relationship between budget deficits and the long-term nominal interest rate in Nepal, between 1975 and 2003.The author concluded that there was a positive correlation between these factors but that the relationship between budget deficits and the long-term nominal interest rate of government securities was insignificant. Also, the author concluded that neither the demand for nor supply of long-term government securities was market-based.

5.2.3 Mixed Empirical Results

Erden and Holcombe (2005) estimated the differences between developed and developing countries in terms of the crowding-out effect by assessing the role of public investment as a determinant of private investment. The authors applied a flexible accelerator model of private investment to both developed and developing countries to identify differences in their investment behaviour. The results showed that public investment complements (crowds-in) private investment in developing countries. Moreover, the results showed that, in developing economies, private investment is constrained by the relatively low level of available bank credit. In contrast, the results showed that public investment crowd out private investment in developed economies.

Mitra (2006) estimated the crowding-out effect in India by using an SVAR model to analyse the behaviour of private investment, government investment, and GDP. The results revealed that public investment crowds out private investment. However, public investment had a positive impact on the country's economy in the long run.

A seminal study conducted by Aisen and Hauner (2008) analysed the impact of budget deficits on interest rates by using the generalised method of moments on panel data from 60 advanced

and emerging countries. The authors showed that budget deficits significantly and positively affect interest rates. Furthermore, they explained that these impacts depend on the interaction term, and, when budget deficits or domestic debts are high and financial depth or openness is low, the effect is significant.

Akinboade (2010) examined the relationship between the government budget deficit and interest rates in South Africa using the Granger causality method. The author concluded that the budget deficit had no impact on interest rates. Chakraborty (2012) examined whether there is any evidence of a financial crowding-out effect due to financial deregulation of the interest rate in India in recent years. The author also found that there is no relationship between the budget deficit and interest rates.

According to economic principals, government borrowing impacts private investment through the lending rate. However, in many developing countries like Sri Lanka, the equilibrium interest rate can be insensitive to market perceptions. Reinhart and Sbrancia (2011) argued that government debt does not affect interest rates. However, government debt can affect private credit due to government interventions such as administrative controls (e.g. a high legal reserve ratio, control of interest rates, and direct intervention in credit allocation).

Based on the literature, we can conclude that many factors influence the effect of public borrowing on private investment, and these factors vary from country to country depending on their socioeconomic and political makeup. The effect also depends on various sectors and industries in each economy. As such, it is difficult to predict the effect for any one country, indicating that further research is needed.

5.3 Analysis of the Impact of Macroeconomic Variables on Private Investment in Sri Lanka

The main purpose of this section is to analyse the present trends in terms of macroeconomic variables that can impact private investment in Sri Lanka. The line graph in Figure 1 below shows Sri Lanka's public borrowing from domestic sources from 1960 to 2014. Domestic sources are the primary source of funding for the government, and the public debt figures show the money taken by the public sector that is no longer available to potential private users. This discussion centres around internal public borrowing because of its potential crowding-out effect. Government borrowing from external sources does not impact internal fund availability, so it has little impact on private investment. Domestic borrowing from the Central Bank of Sri Lanka also does not play a role in creating any crowding-out effects because its purpose is to fund the government without distorting the funds available to the private sector. Sources of domestic public borrowing that are directly relevant to a crowding-out effect include bank and non-bank sources.

Figure 5.1: Public Borrowing from Domestic Sources (PBD), Private Investment (PI), Gross Domestic Product (GDP) 1960–2014
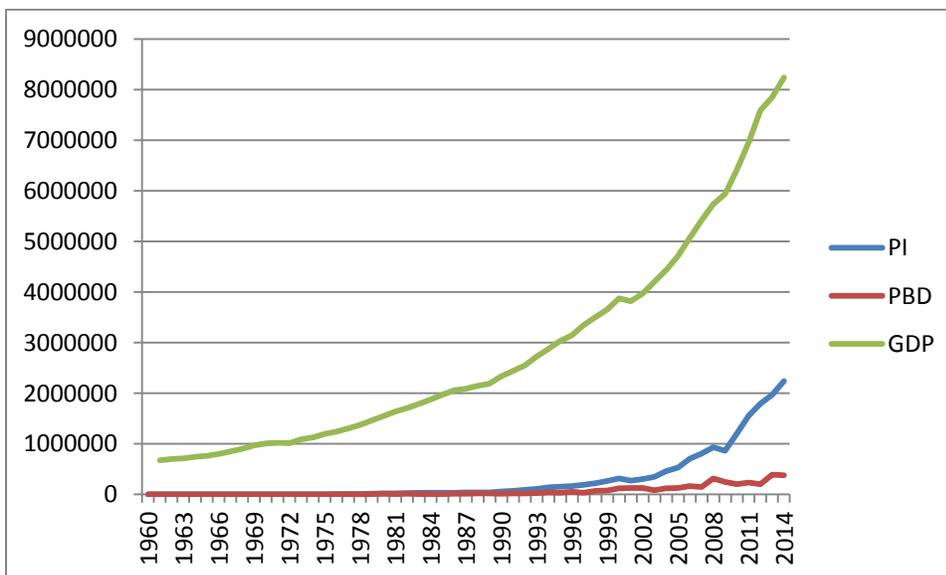
Source: Author's calculations.

Figure 1 shows the increasing trend in public borrowing from domestic sources (PBD). From 1970 to 1979, the PBD remained flat. From 1979 to 1992, it started to increase slightly, and between 1992 and 1995, PBD somewhat decreased. From 1998 to 2002, PBD increased sharply. The most unique characteristic of this graph is that after 2008, there was a drastic increase in PBD to finance the budget deficit of the country.

Private investment refers to investment made by the private sector, and it includes both local and foreign investments. According to Figure 1, after 1979, an increase in private investment began, and the sligh increase continued until 1990. From 1990 to 2000, it increased further and then decreased slightly between 2000 and 2001. From 2001 to 2008, private investment increased sharply, and it again slightly decreased between 2008 and 2009.

Figure 1 shows the country's GDP, which can be defined as the total amount of all domestically produced goods and services. The GDP graph shows an increasing trend, and after 2000, it increased dramatically.

Figure 5. 2: Real Interest Rate 1960–2014

IR
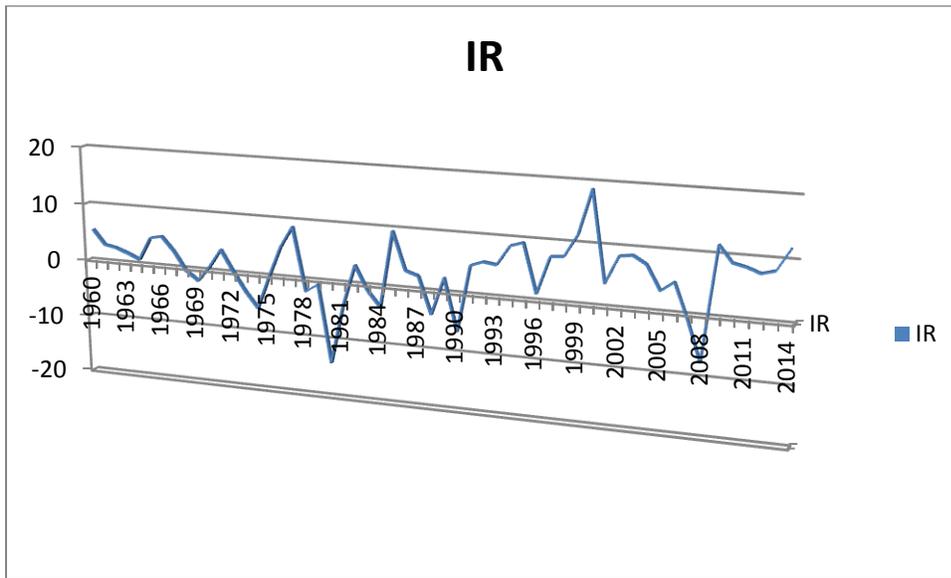
Figure 5.2 shows Sri Lanka's real interest rate from 1960–2014. Real interest rate refers to the

actual weighted average interest rate on advances given by different banks.

Figure 5. 3: Public Borrowing and Private Investment 1960–2014
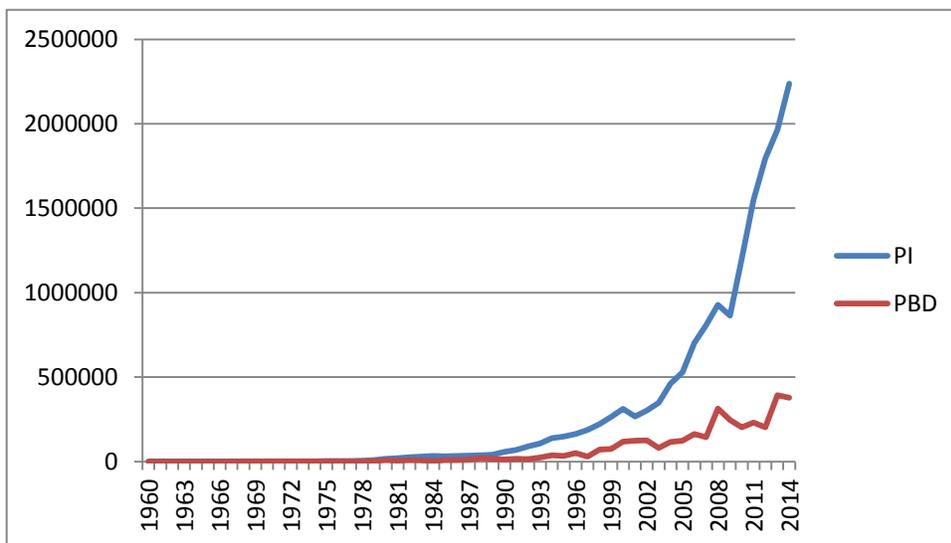
Source: Author's calculations.

Figure 3 indicates a superficial positive relationship between public borrowing and private

investment in Sri Lanka. However, the graphical illustration does not provide any evidence regarding the crowding out of private investment as a result of public borrowing in this country. Therefore, we will use an econometric model to empirically identify whether crowding out is an issue in Sri Lanka.

5.4 Data and Model Specification

5.4.1 Data

This section presents the basic data used for this study. This study uses extensive time series data for Sri Lanka for a period of 54 years, from 1960 to 2014. The sample data were primarily obtained from The Annual Report of the Central Bank of Sri Lanka (2017) and World Development Indicators.

5.4.2 Model Specification

Cruz and Teixeira (1999) use four approaches: the computable general equilibrium (CGE) model, the IS-LM model, an estimation of the investment function, and a model of the supply-side impact. Considering its relative advantages and higher relevancy, we selected the investment function approach to address the crowding-out issue in Sri Lanka. To estimate the private investment demand function in Sri Lanka, we focussed on domestic public borrowing and gross domestic product as explanatory variables as well as interest on advances (weighted average). According to economic theory, the coefficients of GDP are expected to assume positive signs, and those of interest rates are expected to assume negative signs. Public borrowing from domestic sources may be either positive or negative depending on the liquidity position of the country's economy, the psychological effect on private investors, and the nature of loan-backed public expenditures.

The theoretical framework shows the relationship between private investment and public borrowing, GDP, and interest rates. It can be expressed in the following function.

$$PI = f (PB, GDP, IR), \qquad (1)$$

where,

PI   = Private investment

PB   = Public borrowing

GDP = Gross domestic product

IR   = Interest rate

5.4.3 Nature of the Variables

Private investment refers to investment made by the private sector, and it includes both local and international investments. Public borrowing includes all domestically sourced funds borrowed by the government itself and public sector corporations. GDP refers to the total amount of domestically produced goods and services. Interest rate refers to the weighted average interest rate on advances given by different banks. All the data for variables were taken in real terms. For convenience, data for all of the analytical variables except real interest rate, that is, real private investment, real public borrowing, and real GDP, were taken at the log level.

The model has the following form:

$$LRPI= f (LRDPB, LRGDP, RIR) \qquad (2)$$

5.4.4 Method of Estimation

We used yearly time series data for the analysis, and most of the time series are non-stationary. If the series are non-stationary in the regression, the regression results will suffer from the spurious regression problem. To prevent this, we conducted a prior determination of the

unvaried properties of the time series. The series holds the same order of integration, and the combination of non-stationary series that gives a stationary combination can be identified through co-integration techniques. Co-integration testing includes two steps. The first step is checking the stationarity of the data by using unit root tests. The second step is conducting a co-integration test to identify the existence of a long-run relationship. In our analysis, the Augmented Dickey-Fuller (ADF) test was performed to check for the stationarity of the variables. In implementing the ADF unit root test, we verified that each variable in the function was regressed on a constant. We analysed the dynamic interactions and long-run relationships among the variables of private investment in the model using the bounds test of co-integration developed by Pesaran, Shin, and Smith (2001). To establish the existence of a long-run relationship, we used the ARDL co-integration method. The vector error correction method was used to check the speed of the adjustment of the variables. We also used VAR models to analyse the results and used a Granger causality test, variance decomposition analysis, and impulse response function techniques.

5.4.5 Results and Discussion

As a prerequisite for the co-integration test, we used the ADF and Phillips-Perron (PP) tests, including the constant without the deterministic trend as well as with the deterministic trend. The real interest rate (RIR) only rejects the null hypothesis of a unit root in the level form; therefore, the unit root tests were conducted at the first differences level by using the ADF and PP tests for the other three variables: LRGDP, LRPI, and LRPBD. The results of these tests indicate that the RIR is stationary at the I(0) and the other three variables are stationary at the I(1), as shown in Tables 1 and 2.

Table 5.1: ADF and PP Unit Root Tests at Level

Level	ADF		Phillips-Peron Test		Order of Integration
	Constant	Constant with trend	Constant	Constant with trend	
LRPI	0.7708	-2.3019	0.6805	-2.1467	Ho not rejected
	(0.819)	(0.4255)	(0.8427)	(0.5087)	
LRPBD	-1.1459	-4.5522**	-1.2753	-4.4956**	Mixed Results
	(0.6909)	(0.0031)	(0.6347)	(0.0037)	
LRGDP	1.934	-1.058	1.8763	-1.2934	Ho not rejected
	(0.9998)	(0.9263)	(0.9997)	(0.8789)	
RIR	-4.546***	-5.33***	-4.5434***	-5.3173***	I(0)
	(0.0005)	(0.0003)	(0.0005)	(0.0003)	

Note. *, **, *** indicate rejection of the null hypothesis at the 10, 5, and 1 per cent levels of significance. Source: Author's calculations.

Table 5.2: ADF and PP Unit Root Tests at First Differences

First Difference	ADF		Phillips-Peron Test		Order of Integration
	Constant	Constant with trend	Constant	Constant with trend	
LRGDP	-5.6397***	-5.9114***	-5.5783***	-5.7907***	I(1)
LRPI	-5.9912***	-5.9384***	-5.988***	-5.9344***	I(1)
LRPBD	-10.621***	-10.5169***	-16.458***	-16.341***	I(1)

All the variables were non-stationary at the level form except for RIR in both the ADF and PP tests. Therefore, we conducted the unit root test using both the ADF and PP at the first differences, including a constant without the trend and one with the trend. The results in Table 2 show that LRGDP, LRPBD, and LRPI are stationary at I(1) at the 1% significance level. The above

results indicate conditions for using the ARDL-bound test approach because none of the variables in the model are I(2) or higher.

Table 5.3: ARDL Long-Run Form and F-Bound Test

Optimal lag length	(1,4)	
F-Statistic	4.029	
Outcome	Co-integrated	
	Lower Bounds (0)	Upper Bounds (1)
10 per cent level	2.508	3.356
5 per cent level	2.982	3.942
1 per cent level	4.118	5.2

Note. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively. Source: Authors' calculations.

Table 3 shows the results of the ARDL long-run form and F-bound test. According to the bounds testing, the calculated F-statistic is 4.0296, which is greater than the upper bound critical value of 3.942 at the 5% significance level. The results of the bounds testing confirmed the long-run co-integration between private investment, public borrowing from domestic sources, GDP, and interest rate.

To establish the existence of a long-run relationship, we used the ARDL co-integration method and estimated the long-run parameters by using the maximum order of the lag. The model was estimated by using the ARDL (1,0,1,0) specification, and the estimated results were calculated by normalising private investment in the long run.

Table 5.4: Results of the ARDL (1,0,1,0) Long-Run Model

Variable	Coefficient	Standard Error	T-Statistics	Probability
LRPBD***	0.839967	0.288459	2.911911	0.0055
LRGDP	0.328667	0.421760	0.779276	0.4397
RIR	-0.000631	0.007543	-0.083700	0.9337
C	-1.494383	1.765588	-0.846394	0.4016

Note. Dependent Variable: D (LRPI). ** and *** represent the 5% and 1% significance levels, respectively.
Source: Author's calculations based on CBSL data.

Table 4 shows the result of the ARDL (1,0,1,0) long-run model. The estimated coefficients of the long-run relationship showed that, for public borrowing from domestic sources (LRPBD), the coefficient sign is positive and significant at the 1% level. This means that, when all other variables are equal, a 1% increase in LRPBD leads to an approximately 83% increase in the private investment (LRPI). This result provides evidence that there is an absence of financial crowding out in Sri Lanka and, quite unexpectedly, shows financial crowding in in Sri Lanka.

The relationship between GDP and private investment was positive and not statistically significant. According to the LRGDP coefficient, a 1% increase in GDP would increase private investment by approximately 32%.

The coefficient of the real interest rate had a negative sign and was not statistically significant. The RIR coefficient indicated that a 1% increase in the interest rate would lead to a 1.49% decrease in private investment.

Table 5.5: Diagnostic and Specification Tests for co-integration

Test Objective	Test	Test Statistics	Probability
Heteroskedasticity	Breusch-Pagan Godfrey	1.626655	0.1715
Serial Correlation	Breusch-Godfrey Serial Correlation LM Test	0.436735	0.6489
Normality	Histogram-normality Test (Jarque-Bera)	2.083165	0.3528

Source: Author's calculations.

Table 5 displays the diagnostic and specification tests for co-integration. This study used different diagnostic and specification tests on the error correction model, and the results are shown in Table 5. The Breusch-Godfrey serial correlation LM Test did not show any evidence of a serial correlation in the disturbance of the error term. The Breusch-Pagan Godfrey heteroskedasticity test indicated that the errors were independent of the repressors. The Cusum test suggested that the model was correctly specified. The Jarque-Bera normality test showed that the errors were normally distributed.

The results of the short-run dynamic obtained from the error correction model (ECM) equation are associated with a long-run relationship.

Table 5.6: ARDL (1,0,1,0) model error correction model results

Variable	Coefficient	Standard Error	T-Statistics	Probability
LRPI(-1)	0.814288	0.067280	12.10301	0.00000
LRPBD	0.155992	0.053557	2.912661	0.0055
LRGDP	4.942668	0.895533	5.519246	0.00000
LRGDP(-1)	-4.881630	0.922675	-5.290735	0.00000

RIR	-0.000117	0.001407	-0.083335	0.9339
C	-0.277525	0.397083	-0.698910	0.4881
CointEq (-1)	-0.185712	0.037470	-4.956362	0.00000

Table 6 shows the ARDL (1,0,1,0) model error correction model results. The value of the equilibrium correction coefficient calculated by the ECM model is -0.1857, and it is highly significant. This indicates a correct sign and a relatively low-speed adjustment towards equilibrium after a shock. The results indicate that the short-run impact of a change in public borrowing from domestic sources on private investment would be positive at the 10% significance level. Also, LRGDP(-1) shows a negative sign, and the coefficient is significant at the 1% level. GDP shows a positive sign and has a highly substantial degree in the short run. In the short term, the interest rate coefficient is negative and not significant.

We used VAR models to analyse the results, and we used a variance decomposition analysis, Granger causality test, and impulse response function.

Table5. 7: Granger Causality Test

Null Hypothesis	Chi-Square	Outcome
LRGDP does not cause the LRPI	2.997519(0.2234)	Accept the null hypothesis
LRPBD does not cause the LRPI	3.309426(0.1911)	Accept the null hypothesis
RIR does not cause the LRPI	0.876210(0.6453)	Accept the null hypothesis
LRPI does not cause the LRGDP	12.04047(0.0024)***	Reject the null hypothesis
LRPBD does not cause the LRGDP	5.367268(0.0683)	Accept the null hypothesis
RIR does not cause the LRGDP	2.477280(0.2898)	Accept the null hypothesis
LRPI does not cause the LRPBD	8.031584(0.0180)***	Reject the null hypothesis

LRGDP does not cause the LRPBD	0.246268(0.8841)	Accept the null hypothesis
RIR does not cause the LRPBD	0.096280(0.9530)	Accept the null hypothesis
LRPI does not cause the RIR	0.941352(0.6246)	Accept the null hypothesis
LRGDP does not cause the RIR	2.678537(0.2620)	Accept the null hypothesis
LRPBD does not cause the RIR	2.035854(0.3613)	Accept the null hypothesis

Source: Author's calculations.

Table 7 shows the results of the Granger causality test. The dependent variable interest rate in the table shows the p-values of GDP, PBD, and PI are more than 5%; therefore, we cannot reject the null hypothesis. Rather, we accept the null hypothesis. That means that GDP, PBD, or PI cannot affect the interest rate. In the table, the dependent variable, GDP, shows that the probability values of the interest rate and public borrowing from domestic sources are more than the 5%, so we can conclude that the interest rate and public financing from internal sources cannot affect GDP. However, the p-value of private investment is less than 5%; that means private investment can affect the GDP of Sri Lanka, and the variable is at the 1% significance level. The Granger causality results for the dependent variable, PBD, show that the interest rate and GDP cannot affect PBD. However, LRPI can affect LRPBD. The results for the dependent variable PI show that the LRGDP, LRPBD, and RIR cannot affect private investment.

Variance Decomposition Analysis

The relative importance of each random shock (or innovation) is shown in the behaviour of the variables obtained from the variance decomposition analysis. Variance decomposition helps to quantify the proportion of variations of the dependent variable explained by each of the independent variables. Tables 8 and 9 show the results of the variance decomposition approach,

describing the variations in the three variables due to the one standard deviation in innovation.

In the first and tenth years, the variations in LRPI attributed to LRPI itself were 100 and 95.98 per cent, respectively. It seems that the highest share of difference in LRPI is explained by the LRPI itself. The impact of the LRGDP on LRPI was increasing in the long run, accounting for 0.00 and 0.85 per cent, that of the LRPBD on LRPI was a small increase in the long run, accounting for 0.00 to 2.32. and that of the LRPBD on LRPI was a small increase in the long run, accounting for 0.00 to 2.32 in the first and tenth years, respectively. In first and tenth years, the variations in LRPI attributed to RIR were 0.00 and 0.83 per cent, respectively.

In the first and tenth years, the variations in LRGDP attributed to itself were 59.27 and 53.93 per cent, respectively. It seems that the most prominent share of variation in LRGDP was explained by the LRGDP itself. However, in the long run, the LRPBD on LRGDP increased from 14.28 to 14.93 in the first and tenth years, respectively. Furthermore, the impact of the IR on LRGDP also increased by 0.00 and 9.78 per cent in the first and tenth years, respectively. However, the impact of LRPI on LRGDP was decreasing in the long run, accounting for 26.44 and 21.34 per cent in the first and tenth years, respectively.

In the first and tenth years, the variations in LRPBD attributed to LRPBD were 95.25 and 64.01, respectively. It seems that a significant share of change in LRPBD was explained by the LRPBD itself. The long-run impact of the LRPI on LRPBD increased drastically, from 4.74 to 36.07 per cent in the first and tenth years, respectively. The impact of RIR on LRPBD also increased in the long term, from 0.00 to 0.63 per cent in the first and tenth years, respectively. However, the effect of the LRGDP on LRPBD decreased in the long run, accounting for 0.00 and 0.55 per cent in the first and tenth years, respectively.

In the first and tenth years, the variations in RIR attributed to RIR itself were 99.2 and 87.54,

respectively. It seems that a higher share of the variation in RIR was explained by the RIR itself. The impact of the LRPI on the RIR increased in the long run, from 0.16 to 6.38 per cent in the first and tenth years, respectively. The impact of LRGDP on RIR also increased in the long run, from 0.08 to 0.53 per cent in the first and tenth years, respectively. The impact of the LRPBD on RIR also decreased in the long run, accounting for 0.54 and 5.52 per cent in the first and tenth years, respectively.

Impulse Response Analysis

Table 5.8: Variance Decomposition of LRPI and LRGDP

Period	Variance Decomposition of LRPI					Period	Variance Deomposition of LRGDP				
	S.E.	LRPI	LRGDP	LRPBD	RIR		S.E.	LRPI	LRGDP	LRPBD	RIR
1	0.06	100.00	0.00	0.00	0.00	1	0.00	26.44	59.27	14.28	0.00
2	0.97	99.00	0.01	0.69	0.28	2	0.01	39.57	39.02	20.3	1.09
3	0.11	98.95	0.05	0.76	0.22	3	0.01	39.91	39.07	18.46	2.53
4	0.12	98.16	0.10	1.34	0.38	4	0.01	38.15	40.9	16.28	4.65
5	0.13	97.47	0.17	1.83	0.50	5	0.01	35.25	43.5	14.96	6.27
6	0.14	96.99	0.26	2.14	0.59	6	0.02	32.11	46.15	14.28	7.45
7	0.14	96.66	0.37	2.3	0.65	7	0.02	29.01	48.6	14.06	8.30
8	0.14	96.42	0.51	2.34	0.71	8	0.02	26.14	50.73	14.18	8.94
9	0.15	96.2	0.67	2.34	0.77	9	0.02	23.57	52.49	14.5	9.42
10	0.15	95.98	0.85	2.32	0.83	10	0.02	21.34	53.93	14.93	9.78

Table 5.9: Variance Decomposition of LRPBD and RIR

Period	Variance Decomposition of LRPBD					Period	Variance Decomposition of IR				
	S.E.	LRPI	LRGDP	LRPBD	RIR		S.E.	LRPI	LRGDP	LRPBD	RIR
1	0.14	4.74	0.00	95.25	0.00	1	5.24	0.16	0.08	0.54	99.20
2	0.15	13.78	0.42	85.68	0.11	2	5.50	4.55	0.37	0.49	94.57
3	0.1	20.8	0.38	78.15	0.56	3	5.6	5.96	0.37	3.38	90.2

								3					7
	6	9											
4	0.16	26.29	0.36	72.81	0.53	4	5.69	6.08	0.41	5.01	88.49
5	0.17	29.92	0.36	69.19	0.52	5	5.71	6.13	0.44	5.40	88.01
6	0.17	32.34	0.37	66.74	0.53	6	5.71	6.19	0.46	5.48	87.85
7	0.18	33.91	0.40	65.11	0.56	7	5.71	6.25	0.48	5.49	87.75
8	0.18	34.94	0.44	64.01	0.59	8	5.72	6.30	0.50	5.50	87.67
9	0.18	35.62	0.49	63.26	0.61	9	5.72	6.35	0.52	5.51	87.6
10	0.18	36.07	0.55	62.73	0.63	10	5.72	6.38	0.53	5.52	87.54

The impulse response functions present the accumulated responses of the variables to a one standard deviation structural shocks

Figure 5.4: . Impulse response functions

Response to Cholesky One S.D. (d.f. adjusted) Innovations ± 2 S.E.
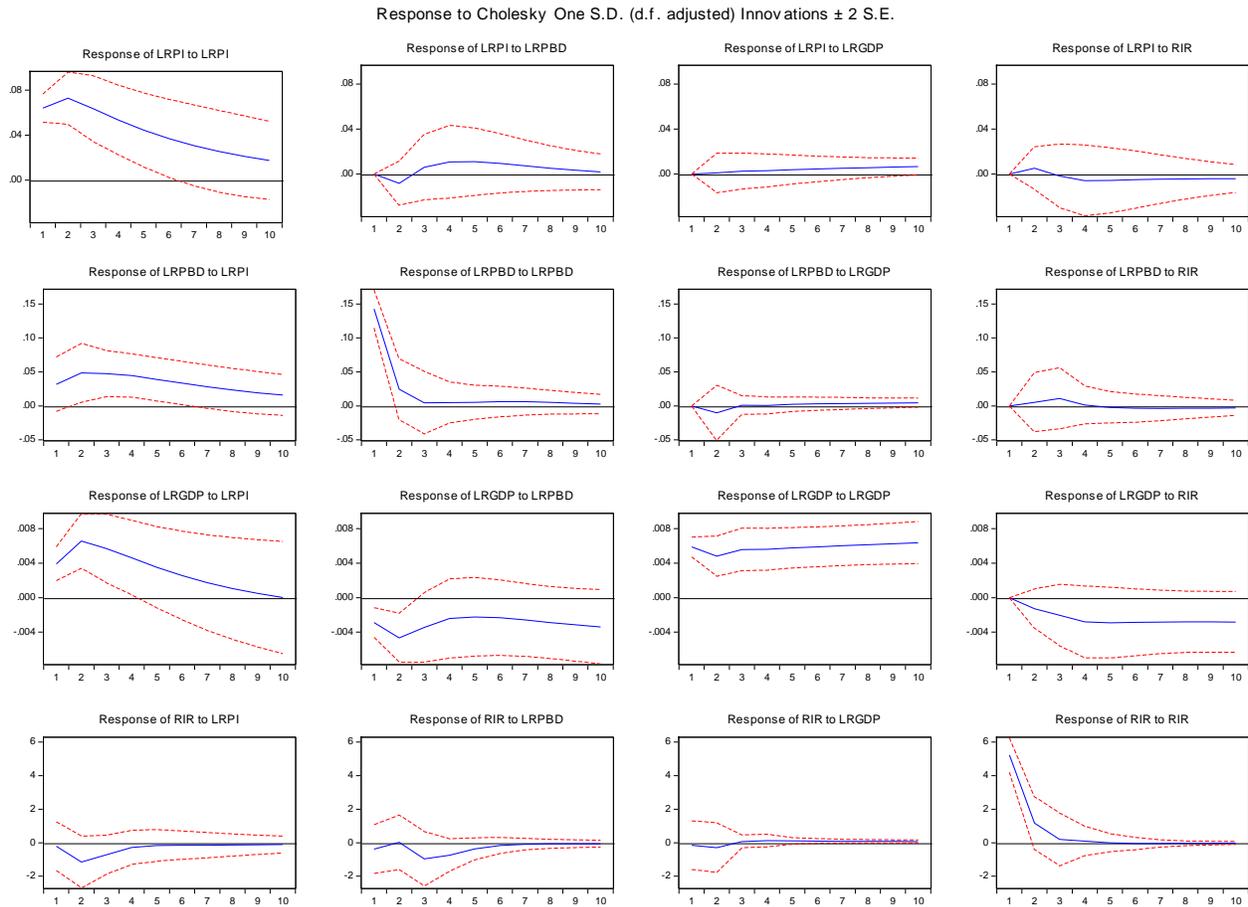
The first graph shows the response of LRPI to LRPI and explains the effect of one positive shock on one standard deviation to private investment. Private investment will show an increasing positive relationship up to the second period; after that, it will become a decreasing positive relationship. The response of LRGDP to the LRPI graph shows that LRGDP will have a positive relationship from one to ten periods. Up to the second year, it shows an increasing positive relationship; after that, it becomes a decreasing positive association with the LRPI, and in year 10, there will be a zero impact. The response of LRPBD to LRPI graph shows that they will have a positive increasing relationship up to the first period; after that, LRPBD will have a decreasing positive impact on LRPI. The response of the RIR to LRPI graph shows that the RIR will have a negative association with LRPI. Up to the first period, the result shows a decreasing negative relationship; after that and up to the fifth period, the result shows an increasing negative relationship and becomes constant up to the ninth period, and in year ten, it will become a zero impact.

This study provides evidence of a positive relationship between public debt from domestic sources and private investment in Sri Lanka. Public borrowing would not lead to a decrease in private investment in Sri Lanka when increasing the government borrowing from domestic sources increases interest rates by increasing demand for loanable funds. All other matters being equal, higher prices will lead to reduced investment because of the lower rate of return. However, this is meaningless because the Sri Lankan interest rate is directed by the Central Bank of Sri Lanka rather than automatically adjusted by the market. This shows that the government has effectively used accommodative monetary policy to control the pressure of interest rates and private investment in Sri Lanka in the long run.

Moreover, the Sri Lankan government has been able to maintain a positive balance between its capital and financial accounts by adopting unilateral liberalisation of its capital account. The Sri Lankan government has been able do this by borrowing heavily from multilateral and bilateral donors and the euro dollar markets. Furthermore, the significant values of worker remittances have also helped to manage this positive condition in the country.

5.5 Conclusion and Recommendation

The current study examined the crowding-out effect of public borrowing on private investment in Sri Lanka. The results of the study confirm that there is no crowding-out effect in Sri Lanka from public borrowing. Our estimated results show that when public borrowing from domestic sources is increased, it positively impacts private investment in Sri Lanka. This indicates an absence of the crowding-out effect due to public borrowing from domestic sources. To test reverse causality, we used the Granger causality test, and the results show that private investment can affect GDP and public borrowing in Sri Lanka. There are few findings supporting this positive effect of public borrowing on private investment from a macroeconomic point of view. To examine this topic from this perspective, we analysed macroeconomic issues and identified factors such as the employment of effective monetary policy by the government to mitigate the crowding-out effect, liberalisation of the financial market, and increased foreign remittances in the recent decades, to show that there is a a crowding-in effect rather than a crowding-out effect in Sri Lanka.

The absence of a crowding-out effect emphasises the possibility that governments can finance budget deficits through domestic sources without influencing private investment. This shows that the Central Bank of Sri Lanka has successfully mitigated the crowding-out effect of public borrowing from internal sources through an accommodative monetary policy. Liberalisation in

the financial markets effects monetary expansions through short-term capital inflows. Therefore, the Sri Lankan government changed its method of borrowing from conventional foreign lenders to some emerging lenders. During the last few decades, this has increased the foreign remittances of the country, and it appears to have eased constraints. This indicates the ability of the Sri Lankan government to employ an accommodative monetary policy to decrease the negative impacts of government borrowing from domestic sources.

Chapter Six

Public Debt Sustainability in Sri Lanka

6.1 Introduction

Debt sustainability has become a popular topic among policy makers because of the negative consequences of the debt crisis in the Euro zone and the United States, and the recent global economic recession. The sharp increase in public debt and fiscal deficit in many countries over the past few years has further highlighted the issue of debt sustainability, and increased the need for significant monitoring of key debt and deficit indicators over the medium and long term. Debt crisis results from poor debt management policies and excessive borrowing by the government beyond a threshold level, creating instability, and the government's inability to repay its debt without severe adjustment to its revenue and expenditure. The International Monetary Fund (IMF; 2003) indicated that the public debt to GDP ratio should not exceed 60 percent to guarantee that the debt is sustainable. However, some countries with lower debt to GDP ratio (Mexico, Thailand, Ukraine) are also facing debt crisis.

Recently, public debt has emerged as one of the critical economic issues among policy makers in Sri Lanka. By the end of 2017, the average debt to GDP ratio in Sri Lanka was 77.6 percent. The total debt service payments were Rs. 1603 billion, while the total interest payment on public debt as a percentage of GDP was 5.5 percent in 2017 (CBSL, 2017). According to IMF (2003), the debt level of a country is sustainable if the ratio is below 60 percent. However, this ratio is much higher in Sri Lanka. Given this critical situation, the government is under pressure to establish debt sustainability policies and stabilize debt ratio at a feasible range. To maintain the government debt at a sustainable level, the Sri Lankan government established a revenue based

fiscal consolidation strategy to reduce the debt to GDP ratio below 70 percent in the medium term. Government borrowings facilitate the development of a country by creating more opportunities for public investment and can potentially lead to a virtuous cycle for the country. However, if not controlled and used prudently, it becomes a vicious cycle for the economy, leading to various problems for the whole society. High level of debt servicing cost and high public debt stock create different negative economic, social, and political impacts on the country.

The public debt of any country has many implications on its economy and Sri Lanka is no exception. Clements et al. (2003); Malik et al. (2010); Pattillo et al. (2011); Reinhart and Rogoff (2010); Reinhart et al. (2012); Safdari and Mehriz (2011) argue that a higher debt to GDP ratio negatively affects the economic growth. Greiner (2011) shows that when there is an increase in the debt to GDP ratio, budget deficit may increase. Lin (2000) shows that if the growth rate is greater than the real interest rate, debt will increase the growth rate of real per-capita output, and if the growth rate is lower than the real interest rate, debt will decrease the growth rate of real per-capita output. According to Kumara and Woo (2010), a high level of debt stock increases the interest rate and inflation. High interest rate in the local market further increases the cost of borrowing for the private sector. Huge debt and high budget deficits generate crowding out effect and discourage private sector investment, which in turn negatively affects the long-run economic growth potential of the country. In fact, this is an ongoing debate in Sri Lanka, as some policy makers have mixed opinion on the consequence of the heavy public debt on its economy.

There is a large body of literature on public debt sustainability. However, literature relevant to the Sri Lankan context is limited. Furthermore, there is no recent analysis on the public debt

sustainability of Sri Lanka. Therefore, the current study attempts to provide an empirical analysis on public debt sustainability in Sri Lanka by using the most recent data, and presents some policy recommendations for public sector authorities. The study is arranged as follows: The second section summarizes the theoretical framework of public debt sustainability. The third section analyzes the public debt sustainability scenario in Sri Lanka. The fourth section provides the existing theoretical and empirical literature. The fifth section discusses the multivariate time series techniques relevant for estimating the model. The sixth section comprises empirical results and discussion. Finally, the seventh section provides the conclusion and policy recommendation.

6.2 Theoretical aspects of public debt sustainability

There is no single definition of debt sustainability—different researchers and economic reviewers have presented a different definition for debt sustainability. Kappagoda (2004, p.166) defines the debt sustainability of a country as "ability to service its borrowings, foreign and domestic, public and publicly guaranteed and private non- guaranteed, including both short and long- term debt, without compromising its long- term goals and objectives." Debt sustainability can be divided into the two parts: external debt sustainability and the fiscal debt sustainability. External debt sustainability depends on the ability to generate foreign exchange and fiscal sustainability depends on the ability of a country to increase or broaden its tax system to generate revenue. Additionally, debt sustainability can be divided into two categories, solvency and liquidity. Liquidity can be defined as the ability of a government to repay its debt on time with interest from its cash inflows. Solvency means non-accumulation of excessive debt in comparison to GDP and the ability to get new debt at a reasonable cost. Furthermore, there is

no specific level to measure debt sustainability because all countries are at different levels of development. The sustainable level of debt is estimated by using the benchmark of different debt indicators, although there is no specific level of debt indicators that can be used in all countries. Therefore, sustainability can be defined as a dynamic concept that can be estimated by using different indicators. Generally, debt sustainability can be estimated by using two indicators, namely, debt to GDP ratio and debt service payment as a percentage of the reserves. Debt sustainability is more important to a country because the public debt impacts the final outcome of a country's fiscal policy. Therefore, to establish debt sustainability, government should consider stabilizing the debt to GDP ratio between the feasible range and avoid increasing the ratio an unsustainable level.

Every country has a legal agreement to settle down its foreign debt. The present value of the resources transferred to foreign countries should be equal to the starting debt stock of the country, then the debt settlement of the country is sustainable. To repay its loans in the future, the borrowing country should create a budget surplus. However, the discounted value of the future budget surplus is lower than the present debt stock, then the debt is not sustainable. This will tend to unsettle debt servicing, including the interest and principal repayment. A country that continuously records primary budget surplus will tend to increase the likelihood of debt sustainability because of various reasons. The repayment of accrued interest will decrease that will lead to reducing the crowding out effects. It will also improve the efficiency of resource distribution and income through the reduction in accumulated interest payments. Furthermore, debt sustainability is enhanced by increasing the demand for money because of decreasing inflationary expectation.

Fiscal discipline is also the most important criterion for ensuring the overall macroeconomic

stability of a country. It provides necessary flexibility for an effective and independent monetary policy implementation. Lack of fiscal discipline creates many problems for the economy, such as fiscal dominance and diluting the effectiveness of monetary policy to achieve price stability. Therefore, fiscal authorities establish numerical targets for fiscal outcomes, such as the government budget deficit, expenditure, revenue, and debt. These fiscal rules are the most essential to ensure a country's budgetary operation that is aimed at achieving long-term fiscal sustainability and solvency. Fiscal rules can be divided into four types, namely, debt rule, budget balance rule, expenditure rule, and the revenue rule. The debt rule includes the public debt as a percentage of GDP target, while the budget balance rule posits that the government expenditure cannot exceed the revenue. The expenditure rule establishes some limits of current and total spending. The revenue rule aims to improve revenue collection and avoid the excessive tax burden (CBSL, 2017). The lack of these adequate monetary processes and fiscal discipline resulted in accumulation of the heavy debt for the government of Sri Lanka.

Public debt sustainability shows a country's solvency, liquidity, and capacity for adjustments. The government debt is liquid if it has the capability of rolling over maturing debt obligations. However, debt sustainability assessments are conducted from a medium- to long-term perspective. If a country faces difficulties in accessing the financial markets in the short term, then it can face debt sustainability problems in the medium term, and also experience gradually increasing higher bond yields, leading to higher cost of servicing the debt. The government debt is considered sustainable only if the fiscal policies of the country ensure the sustainable debt levels are feasible in both economic and political terms. Conventional debt sustainability analysis can be defined as the simple accounting exercise based on the standard debt accumulation equation. Based on this equation, changes in the debt to GDP ratio are derived from the impact

of three components: (1) interest–growth differential which captures the impact of the debt ratio increase, (2) the primary balance, and (3) the deficit–debt adjustment. Conventional debt sustainability analysis is based on the gross general government debt rather than the net debt concept.

Table 6.1: Some indicators that measure the liquidity and solvency of the government debt (domestic and external)

Domestic	External
1. Liquidity Measures	**1. Liquidity Measures**
(a) Total domestic debt service payments/revenue	(a) Foreign debt service payments/ net exports
(b) Interest payments for domestic debt/revenue	(b) Foreign reserves/short-term external debt
(c) Short-term debt/total outstanding debt	(c) Interest payments for external debt /reserves
	(d) Short-term external debt/total external debt
	(e) Short-term debt/international reserves
2. Solvency Measures	**2. Solvency Measures**
(a) Domestic debt/GDP	(a) External debt/GDP
(b) Domestic debt service payments/government revenue	(b) External debt/export earnings
	(c) External debt service payments/export earnings
	(d) Interest payments/export earnings

Source: *IMF and World Bank, 2001; Debt Relief International, 2004; UNESCAP, 2005*

Given the negative consequences of high debt levels of a country, some international agencies like the World Bank and the IMF have established certain threshold ranges to achieve debt sustainability.

6.3 Analysis of public debt sustainability scenario in Sri Lanka

Since its independence, the Sri Lankan government debt has been steadily rising. During the 1950–2018 period, the government debt to GDP ratio grew at an annual average rate of 2.8 percent compared to the average growth of 4.5 percent in nominal income during the same period. The growth of public debt compared with the increase in per capita income and exchange rate depreciation reflects the impact of sustained fiscal deficits and restricted access to concessional financing. Limited access to concessional fund and the financing of foreign currency motivated commercial borrowings such as sovereign bonds, syndicated loans, and the short-term borrowings resulting in a significant increase in foreign currency denominated debt. The government debt stock, which was 16.9 percent of GDP at the end of 1950, went beyond 100 percent of GDP a few times, before moderating to 68.7 percent in 2012 and has increased steadily since then. The government debt stock reached 82.9 percent at the end of 2018. To maintain the government debt at a sustainable level, the Sri Lankan government established the revenue based fiscal consolidation strategy with the aim of reducing the debt to GDP ratio below 70 percent in the medium-term.

Similar in many countries, most of the infrastructure projects in Sri Lanka are heavily dependent on foreign finance, due to the low savings rate of the government (budget deficit) and the private sector, and due to the external sector deficit. Therefore, to fulfill the capital requirements of the economy and execute various infrastructure projects, the government needs to access either the external market or the domestic market. Many other factors affected the increase in public debt in Sri Lanka, such as the terrorist war in past decades, the declining trend of government tax revenue, increase in government expenditure, declining official development assistance (ODA) from donor countries, and poor debt management system.

Furthermore, continued accumulations of public debt in Sri Lanka increased the public debt stock leading to difficulties in debt servicing, because the Sri Lankan government heavily borrowed from bilateral agencies, multilateral agencies, and international capital market at higher interest rates to invest in their mass development projects. Therefore, an adequate monetary process of debt management has become a major policy goal not only for Sri Lanka but also for all the multinational lending agencies and donor countries. Most of the recent mass projects of the government were financed using borrowings, resulting in continuously increasing public debt, which has become a major concern for the economy. In 2012 and 2013, the public debt was recorded at 79.1 percent and 78.3 percent of GDP, respectively, after which it settled at around 80 percent of GDP (CBSL Annual Report, 2012). Therefore, most economists have warned policy makers not to exceed these benchmark levels of public debt in Sri Lanka, because it would adversely impact economic growth through various channels of the economy such as inflation, interest rate, consumption, private investment, and financial development.

During the last decade, Sri Lanka achieved impressive economic growth, averaging 6.4 percent. This was reportedly above its regional peers and helped it to not only increase its per capita income from USD 2000 to USD 3000 but also reduce its unemployment and poverty level during this period (CBSL Annual Report, 2010). Those factors helped Sri Lanka upgrade from the category of low-income country to lower middle-income country in 2010. After this upgrade, the country has been experiencing a reduction in ODA. Therefore, the country was motivated to finance its public investment through commercial borrowings or bond issuances in the international market rather than from grants. Earlier, the government received ample funds from most of the bilateral and multilateral donors, either as concessionary loans or as grants. This impacted the economy favorably because the government received loans at a lower interest rate

or in the form of grants. However, once a country graduates to the lower middle income category, such favorable funding reduces and the country receives loans at higher interest rates. Thus, significant reduction in ODA has led to increase in public debt stock in Sri Lanka in recent years.

If the government issues bonds in the international market, the exchange rate becomes the most significant factor, because fluctuations in exchange rate pose a big risk in an international loan. This factor was the most significant in the Sri Lankan context given the continuous recent depreciation of the Sri Lankan rupees, which has increased the debt burden of the country. The depreciation of the Sri Lankan rupee compared with the major foreign currencies increased the total debt stock by Rs. 225.2 billion by the end 2017. The Sri Lankan rupee depreciated by 2 percent against the US dollar, 5.1 percent against the Japanese yen, 7.5 percent against the Indian rupee, 7.5 percent against Special Drawing Rights, 10.5 percent against the pound sterling, and 13.5 percent against the euro during 2017. Thus, the outstanding foreign debt stocks increased by Rs. 211.9 billion, mainly due to the depreciation of the Sri Lankan rupee against the foreign currencies and increased by Rs. 13.4 billion due to the depreciation of the Sri Lankan rupee against the US dollar, which is the foreign currency denominated domestic debt stock (CBSL, 2017).

Therefore, for an effective debt management system to achieve debt sustainability, it must include a transparent institutional framework procedure for raising debt, and a robust procedure for monitoring public debt and deficit indicators over the medium and long term. Furthermore, it is also important for policy makers to identify the threshold level of debt in a country to accomplish debt sustainability. The World Bank and the IMF guidelines for public debt management comprise effective governance structure for public debt management. Given the

adverse consequences of high debt level of inflation, interest rate, consumption, private investment, and financial development, the IMF and the World bank have established certain threshold ranges for debt sustainability. However, Sri Lanka has not been able to meet these targets established by the IMF and the World Bank and all the indicators are above the limits of the threshold (Table 1).

Table 6.2: Threshold ranges of debt sustainability indicators and actual values in Sri Lanka.

Ratio	Threshold Range	Actual Value in Sri Lanka
Domestic debt service/revenue	28-63	80
Total debt service/revenue	40-63	93
Interest payments/revenue	4.6-6.8	32
Total debt/GDP	33-60	93
Total debt/revenue	92-167	546

Source; Debt Relief International, 2004

The following figure (Figure 1) and discussion shows the borrowing, stock of debt, and interest payment structure and how these scenarios affect the debt sustainability in Sri Lanka.

Figure 6.1: Total debt to GDP ratio 1980-2018
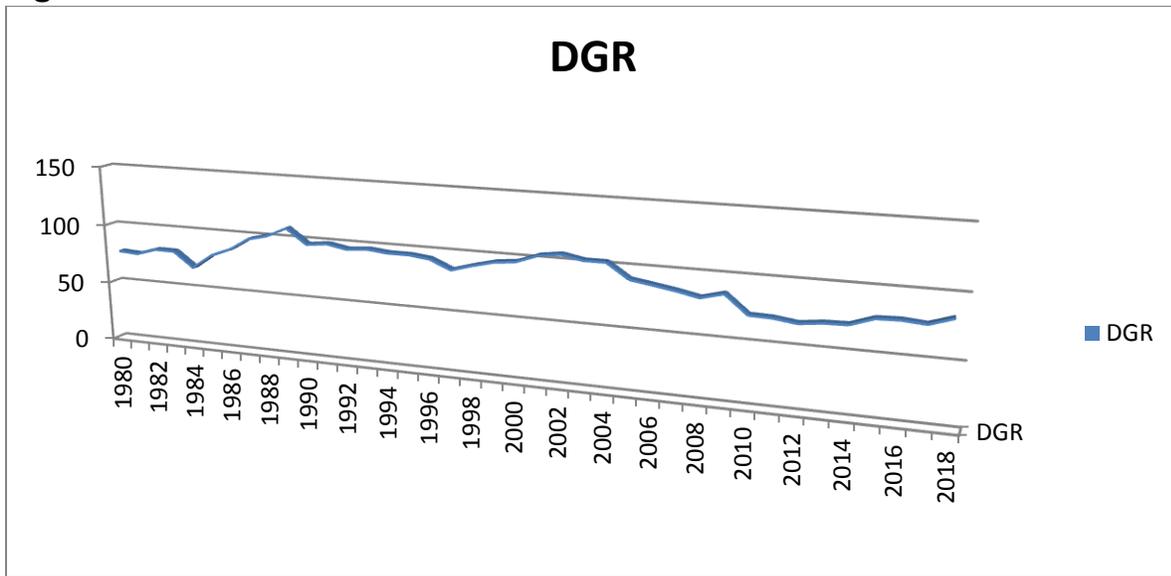
Author's calculation based on CBSL data

The debt to GDP ratio increased steadily over the time in Sri Lanka and averaged 79.86 percent from 1950 to 2018. It went beyond 100 percent in 1989 and 2002, peaking at 108.7 percent in 1989. In 2012, the debt to GDP ratio moderated to 68.7 percent; however, since then, increasing trend in government debt has resulted in the debt to GDP ratio increasing gradually to 82.9 percent in 2018.

Figure 6.2: Total borrowing in Sri Lanka 1980-2018
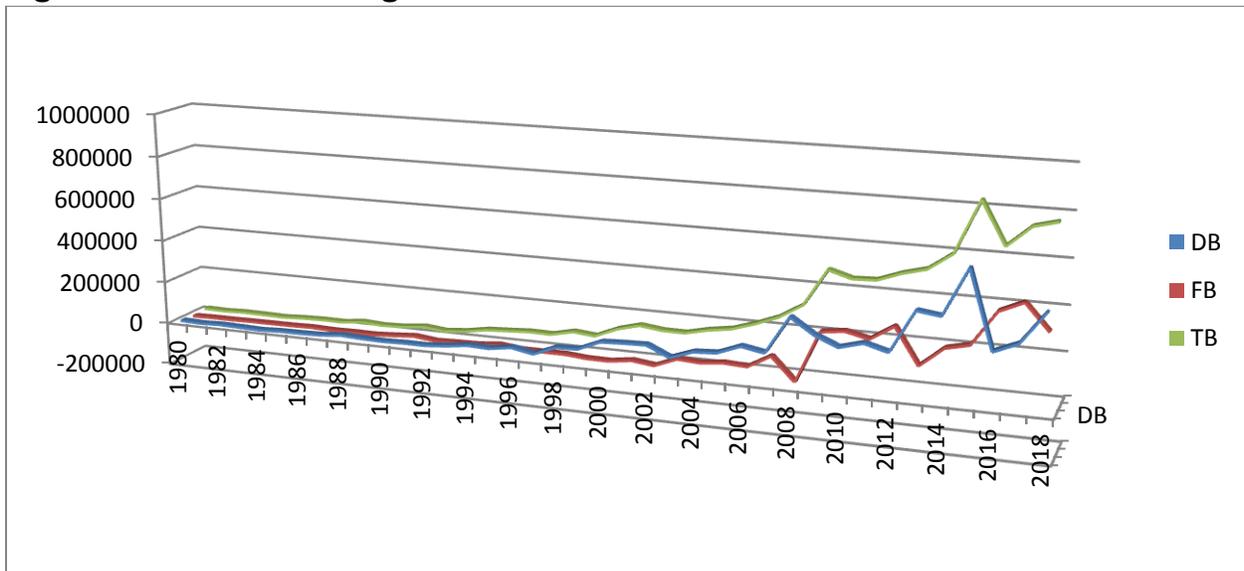
DB: Domestic Borrowing   FB: Foreign Borrowings   TB: Total Borrowings

 Source: Author's calculations based on CBSL data

Figure 6.2 illustrates the trend in government borrowings, which initially increased gradually; however, the 1990s decade witnessed substantial growth in borrowing from domestic sources to finance the budget deficit. The declining trend of tax and non-tax income and increasing trend of current expenditure led to increase in the budget deficit of the country. Therefore, to cover government expenditure and debt service payment, the government was motivated to take new loans. The increasing trend in borrowing from domestic sources led to increase in interest rate and also reduced the loans available for the private sector, thus crowding out private investment in the country.

Figure 6.3: Total debt in Sri Lanka 1980-2018
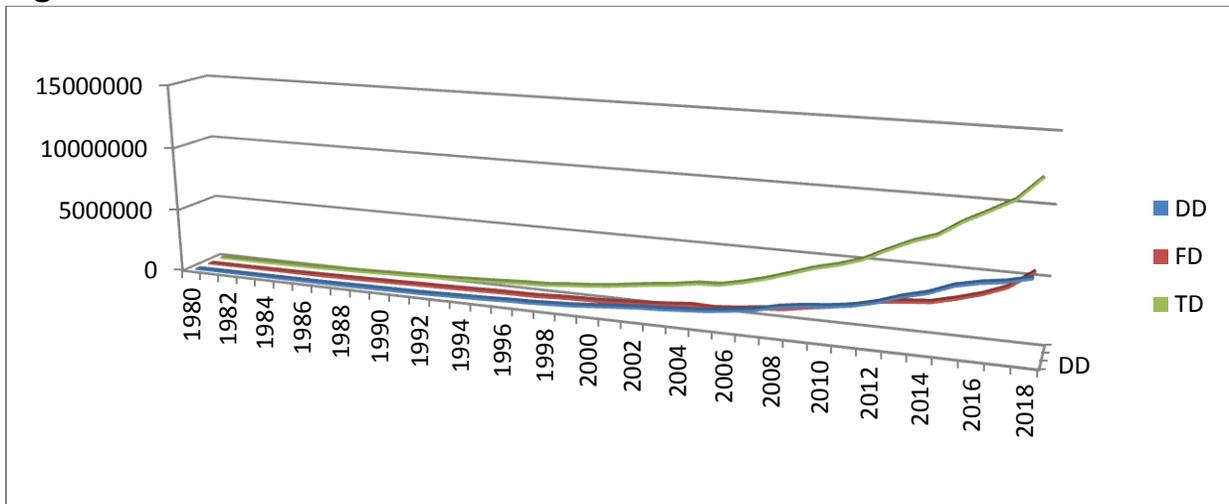
DD: Domestic debt   FD: Foreign debt   TD: Total debt

Source: Author's calculation based on CBSL data

Figure 6.3 illustrates the increasing trend of the domestic debt stock and consequently, the total debt stock after 1995 in Sri Lanka. However, there is no significant gap between the domestic and foreign sources of total debt stock in Sri Lanka because the withdrawing of loans from the domestic is higher compared with the foreign sources. After 1978, large increase of the total debt stock, the government should allocate more for expenditure to cover the debt, which led to high debt stock in Sri Lanka.

Figure 6.4: Total interest payment on Debt in Sri Lanka 1980-2018
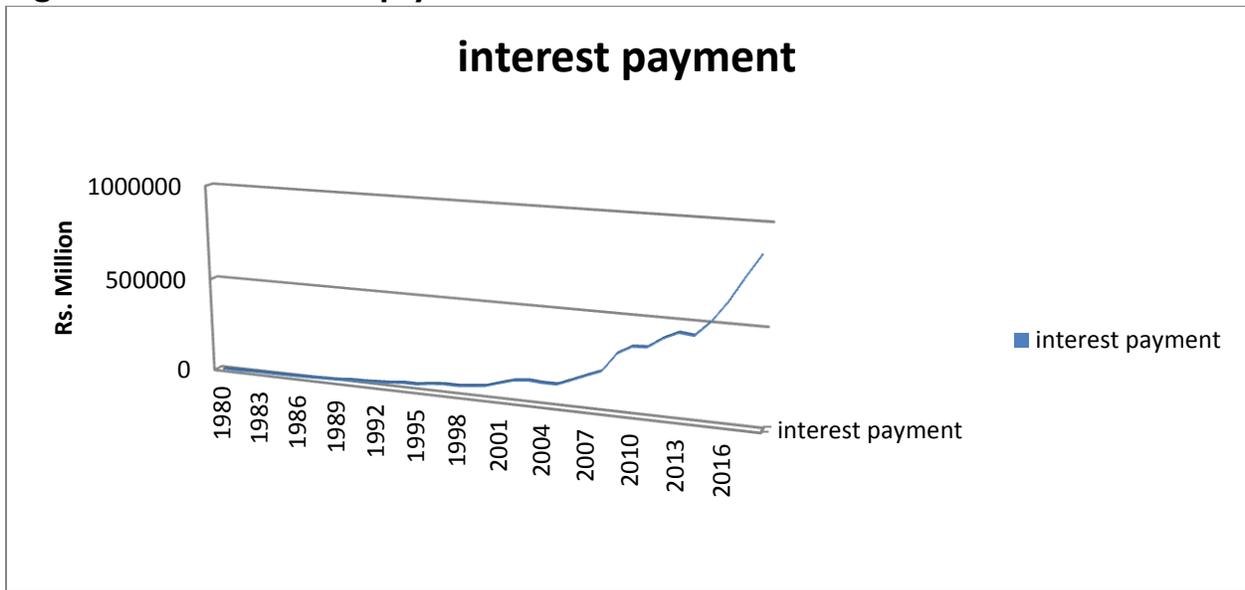
interest payment

Source: Author's calculation based on CBSL data

Figure 6.4 shows the total debt interest payment in Sri Lanka which include the local and international interest payment. The graph shows the increasing trend of the debt interest payment after the 1992 and after 2013 rapidly increasing the interest payment in Sri Lanka. The foreign debt interest rate was comparatively lower than the domestic debt interest rate, however, after 2005 decreasing the foreign loans and governments obtained more loans from domestic sources at higher interest rates. This impacts to higher interest payment and higher debt service payment as well as further increase of the budget deficit in Sri Lanka. This also specially contributed to public debt become unsustainable in Sri Lanka.

Figure 6.5: Total debt service as a percentage of Gross National income 1980-2018
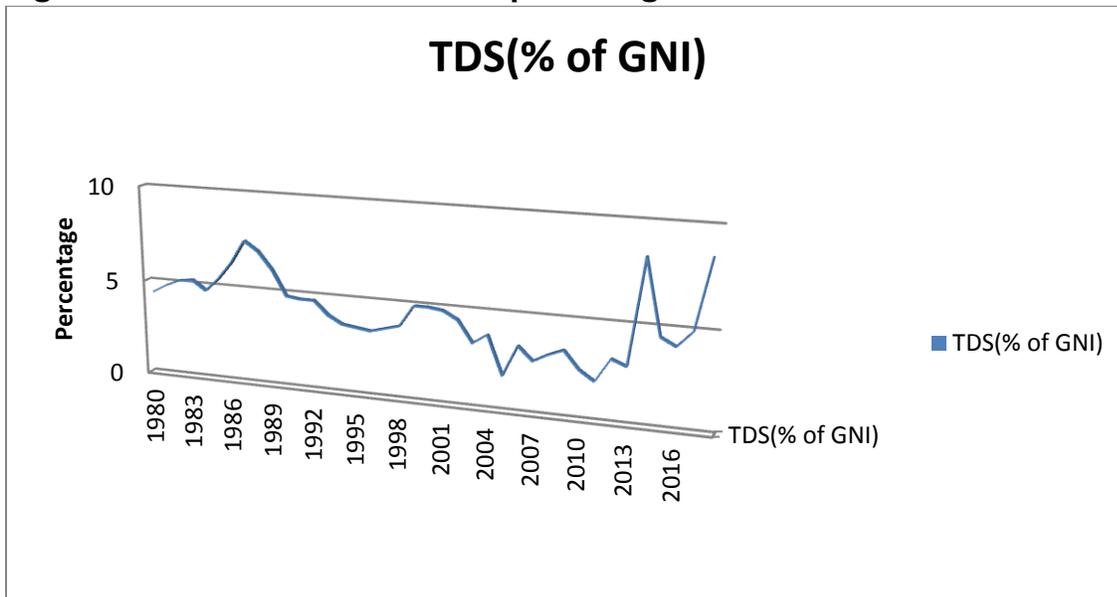
TDS: Total Debt Service Payment

Source: Author's calculation based on CBSL data

Figure 6.5 illustrates total debt service payment increasing, sharply after the 2013 and reached its peak in the year 2014 and 2018. The government gets the new loans for heavy infrastructure projects such as the highways, education and the health projects that impact to increase the debt service payment and accumulated debt stock that resulting unsustainable debt stock in Sri Lanka.

1. **Literature survey – theoretical and empirical aspect**

4.1 Sri Lankan experience of the empirical and theoretical aspect of public debt sustainability

There are few studies related to public debt in Sri Lanka. Jha (2001) analyzes debt sustainability in low income countries by using stationary and co-integration tests covering the period from 1950 to 1999. This study finds that during this period, fiscal situation was stable in Sri Lanka.

Fonseka and Ranasinghe (2008) analyze debt sustainability in Sri Lanka and show the increasing trend of public debt stock and debt servicing in the country. They posit that reducing the deficit

by raising taxes or cutting down capital expenditure is untenable as it negatively impacts the future growth prospects of the economy. Therefore, they recommend eliminating wasteful expenditure and reducing government expenditure as a short-term solution, while achieving high growth in the long-run, thereby overcoming the above problem. Perera and Verma (2008) analyze the sustainability of trade deficit covering the period from 1950 to 2006. This study identifies the long run relationship between export and import in Sri Lanka. The authors use the unit root tests and co-integration techniques to endogenously determine structural break. The finding does not support the existence of a long run equilibrium between exports and imports in Sri Lanka, and explains the ineffectiveness of Sri Lanka's recent macroeconomic policies. Ekanayake (2011) identifies the type of macroeconomic variables that affect debt sustainability in Sri Lanka, mainly focusing on the debt to GDP ratio in the medium term. The study uses structural vector auto regression model to project the endogenous variables related to debt dynamics. It further uses the impulse response function and the variance decomposition analysis for examining the joint dynamic impact of the structural shocks to macroeconomic variables, and concludes that "one standard deviation, positive growth shock results in a reduction in the debt to GDP ratio of 2.4 percent by 2015." Deyshappriya (2012) analyzes the debt and fiscal sustainability in Sri Lanka by applying the inter-temporal budget constrains approach using time series data set during the 1990 to 2009 period. The author employs the Augmented Dickey Fuller (ADF), Dickey Fuller, and Phillip Perron tests and applies the ordinary least square method to examine the determinants of factors that increase the net total debt. This study reveals that fiscal policy during this period was unsustainable in Sri Lanka. Furthermore, results show that the GDP growth rate, political instability, and budget deficit positively impact public debt in Sri Lanka. Therefore, he suggests improving the government revenue while decreasing expenditure

to achieve fiscal sustainability. The author also strongly recommends improving the tax administration, introducing new tax system, decreasing welfare expenditure, and reducing defense cost and transfers to achieve debt and fiscal sustainability. Cooray and Kumara (2013) analyze public debt and economic growth in Sri Lanka using time series data from 1960–2010, and investigate several issues related to public debt in the country,including the exact relationship between debt and economic growth (either positive or negative), the optimum or the threshold level of debt that minimizes its economic cost, the sustainable level of debt for Sri Lanka and whether the Central Bank debt reduction target for 2016 is desirable or not. To investigate the above issues, the authors develop an econometric model based on conditional convergence and also use two–year non-overlapping averages to capture the short- run fluctuations and instrumental variables to analyze the endogeneity problem. The study finds that the exact relationship between GDP per capita growth and public debt is nonlinear in Sri Lanka. It and also finds the threshold level of public debt in Sri Lanka as 59.42 percent of GDP and anything above of this level will have a negative impact on the GDP per capita growth. These findings strongly supported and justified the debt reduction target of the government to about 60 percent by 2016. Banda and Priyadarshani (2014) analyze the impact of government budget deficits on debt sustainability in Sri Lanka using annual time series data from 1960 to 2012. The authors use the novel methodological approach and test government debt by using the face value, market value, and discounted market value of government debt as a proportion of GDP. The results of the ADF–Perron tests show that the debt ratios are non-stationary, implying that public debt in Sri Lanka is unsustainable. The authors suggest shifting from foreign debt to other sources of financing budget deficit or reducing the deficit.

4.2 Literature survey – Theoretical and empirical aspect of debt sustainability

To maintain public debt at a sustainable level, the future primary balance (difference between the total government revenue and expenditure net of interest payment) of the government should be enough to pay the debt obligations of the country. The researchers have used different models and conducted a number of studies to estimate the sustainable level of debt.

Some researchers use the general equilibrium model to estimate debt sustainability of a country. Aiyagari and Mcgrattan (1998) develop the general equilibrium model to calculate the optimal level of risk-free public debt and the welfare costs of deviating from the optimum level. They also discuss about the risks and benefits of public debt. The study mainly focused on the United States, but it determined the optimal debt ratio in a closed economic context.

The debt to GDP ratio is used as the key indicator to measure fiscal sustainability (Blanchard, 1990; Buiter, 1985; Hagemann and Sartor, 1990; Huang and Xie, 2008; IMF, 2013). However, there is no consensus about the fiscal sustainability threshold. Before adopting the euro as its currency, the euro zone's Stability and Growth Pact identified the debt to GDP ratio as a critical metric and stipulated a threshold of 60 percent. However, this threshold level changed over time and by countries or regions. For example, after the financial crisis, this ratio became weaker than before. The higher the debt to GDP ratio, the more is the possibility that a country may default. IMF (2013) shows that among the 55 percent of the defaults recorded that the debt to GDP ratio is below the 60 percent before the default, and the 35 percent of the defaults recorded that the debt to GDP ratio is below the 40 percent.

The sustainability of debt is normally evaluated by calculating the government gross or net debt as a percentage of GDP. Government debt is sustainable when debt to GDP ratio of a country remains stable or decreases over time. There are two conceptual methods to calculate the

sustainability of debt. The first is the accounting method and the second is the present value constraint method. An accounting method, we mainly use the ratio of debt to GDP. Pasinetti (1998) and Goldstein (2003) show that if a stable debt ratio can be managed for a long time, then fiscal policy also becomes sustainable.

The IMF uses two frameworks for the analysis of debt sustainability. These two frameworks can be identified as traditional analysis of debt sustainability and the new sustainability framework. Da Costa and Ramon (2005) undertake the traditional analysis to examine the medium- and long-term debt ratio by using a baseline scenario, which assumes that the future primary balances of the government and some macroeconomic indicators such as the real GDP growth, inflation, real interest rate, and exchange rate to estimate the debt ratio. To estimate the trend of the debt ratio under the baseline projection, the debt level and structure is considered to calculate the sustainable debt level. Therefore, we can emphasize that this traditional approach is highly dependent on the baseline scenario to explain the sustainable debt level.

The IMF's new approach uses the standard template method for projection of debt and also considers the unexpected shocks faced by the economy by conducting stress tests, which provide statistical upper bounds when calculating the debt ratio.

The Overborrowing Hypothesis uses a relative approach to determine the gravity of existing debt of a country. Under this approach, the benchmark debt ratio is calculated and compared with the current debt ratio. If the current debt ratio exceeds the benchmark, it is considered as overborrowing of the government. Under this approach, the benchmark debt level is calculated as follows:

$$\text{d*} \cong \frac{Ps}{(r-g)} = \frac{rev - pexs}{(r-g)}$$

Where d* is the benchmark debt level, ps is the constant primary surplus as percentage of the

GDP expected in the future, r is the real interest rate, and g is the economic growth. The primary surplus is the difference between the average total revenue ratio and the average primary expenditure ratio in a specific period. The benchmark debt ratio is calculated as expected primary surpluses (present value) as a percentage of the GDP over an infinite period.

Mendoza and Oviedo (2004) developed a Natural Debt Hypothesis that estimates the tolerable debt ratio in a crisis situation if the primary balance of the country continues at a low value, which is considered as the upper bound. This upper bound of debt ratio represents the Natural Debt Limit (NDL). According to this model, the shocks encourage the government to alter its spending to a minimum tolerable level to maintain indebtedness at a tolerable level under a crisis situation. If a country's debt ratio is lower than the NDL, the government increases the debt ratio to cover its primary expenditure. Based on this model, the shocks give signal to government to decrease spending to the minimum tolerable level to avoid indebtedness in a crisis situation. If the debt ratio is lower than the NDL in a specific period, the government increases the debt ratio to raise its primary expenditure. If the debt ratio is equal to NDL, the primary expenditure should be reduced to the minimum level.

Carlomagno, Egger, and Sicilia (2008) mainly used the structural Vector Auto Regression (SVAR) model to measure the interrelation between the different endogenous variables such as exchange rate, interest rate, and growth rate using data on the Uruguayan economy. The authors used the impulse response function to measure the combined impact of different shocks to the debt dynamics. This also revealed the joint dynamic effect of structural innovations between endogenous variables and the debt to GDP ratio.

Celasun, Debrun, and Ostry (2007) developed the probabilistic approach by using the fan charts

to estimate debt sustainability in an open economy. This model was developed to estimate the combined impact of shocks to endogenous variables of debt dynamics. The probabilistic approach was applied to Brazil, Mexico, Argentina, South Africa, and Turkey. There are three steps in the simulation algorithm. The first is the fiscal reaction function that describes the estimated average fiscal policy pattern of the economies. The second is the estimate of the unrestricted Vector Auto Regression (VAR) to capture the statistical properties of non-fiscal variables such as growth rate, interest rate, and exchange rate. The third is calculating the corresponding debt path by using the fiscal reaction function. This approach gives the largest number of debt paths with different shocks.

Bohn (1998) proposed the empirical approach to estimate debt sustainability. This method provides a straightforward and important empirical test based on fiscal solvency for debt sustainability. To test the debt sustainability, this method requires the primary balance, outstanding debt, and some control variables. The estimated fiscal reaction function shows the reaction of the budget's primary balance to the movement in outstanding public debt. The positive coefficient of the budget primary balance of outstanding debt, suggests public debt sustainability.

Frank and Ley (2009) presented some modification of the probabilistic approach developed by Celasun, Debrun and Ostry (2007) and identified as the Markov-Switching SVAR. There are some differences from the first model: it uses the bootstrapping technique because the behavior of the variables is asymmetric with thick tails. Instead of calculating fiscal reaction model, it uses the debt stabilizing balance to baseline projection.

Silika and Friedrich (2006) assessed the public debt sustainability by applying the panel co-integration analysis of fifteen European Union member countries from 1970 to 2004 period.

They applied the test for unit root to the public debt to GDP ratio for the individual countries and found that the public debt to GDP ratio is difference stationary in the ten European Union member countries. Furthermore, the panel co-integration results indicated strong evidence of co-integration between the primary budget and debt to GDP ratio among six European union countries. The results proved the public debt sustainability among the selected European union countries during that period

Fincke and Greiner (2012) applied the method proposed by Bohn (1998) to analyze public debt sustainability in selected European countries over a thirty–year period. The estimated results confirmed the sustainability of public debt in the selected countries because of maintaining effective fiscal policies.

Chandia and Javid (2013) conducted a detailed empirical analysis to estimate public debt sustainability of Pakistan from 1971 to 2008. The authors used the fiscal reaction function proposed by Bohn (1998). The results indicated a weak and positive relationship between the surplus to GDP ratio and the lag debt to GDP ratio by using the VAR model. The results confirmed that public debt was unsustainable during this period in Pakistan.

Ozkaya (2013) analyzed public debt sustainability by using quarterly data from 1999 to 2010 in select OECD countries. The study re-examined the three different motives related to public debt in step-wise econometric test procedure. The results proved that four OECD countries— Ireland, Spain, Greece, and Portugal—pursued unsustainable debt policies, while the other four countries—France, Poland, Italy, and Turkey—followed sustainable debt policies over the period covered in the study. The most valuable contribution of this study is to conduct a detailed analysis of long-term debt sustainability by developing a step-wise econometric test procedure.

Pradhan (2014) assessed public debt sustainability in India using co-integration and error

correction mechanism. The study proved that public debt was sustainable in India during the period covered and suggested that the public debt ratio of India will not decrease automatically, and some fiscal corrections were needed to overcome this problem.

Benedict et al. analyzed the sustainability and determinants of external debt of Nigeria by using Johansan co-integration test and error correction mechanism for 1986 to 2010 period. The co-integration test results showed a long-run relationship between external debt and other selected explanatory variables such as debt servicing, GDP, and exchange rate. The estimated results showed that public debt was not sustainable in Nigeria in terms of willingness and ability to pay. The author also suggested that the government should implement only projects with the highest priority and productivity when using external finance.

2. Model specification and data descriptions

5.1 Empirical framework

Public debt sustainability is a crucial problem if a country has a huge fiscal deficit and increasing burden of debt. Public debt sustainability suggests that fiscal policies should be adopted in a manner that satisfies the inter-temporal budget constraints. The budget constraint can be calculated from the following budget identity:

$$PD_t - PD_{t-1} = r_t PD_{t-1} + G_t - R_t \quad \text{......................} (1)$$

Where PD is Public Debt, G is government expenditure, R is government revenue, and r is interest on public debt. The public debt sustainability test proposed by Bohn suggests analyzing whether the primary surplus relative to GDP is a positive function of public debt relative to GDP. The meaning of this test is that the government should adopt a fiscal policy, such that an increasing the debt ratio leads to higher primary surplus compared to GDP. Public debt

sustainability can be estimated by using the following equation that shows whether the government implements suitable measures to confirm the intertemporal budget constraint:

$$BS_t = \beta_0 + \beta_{1PD_{t-1}} + \mu_t \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots(2)$$

Where BS is the primary budget surplus to GDP ratio and μ_t is the error term. If β_1 becomes positive and statistically significant it gives a reliable information about the sustainability of public debt. The rationale behind this theory is that debt sustainability cannot be achieved unless the accumulated public debt is covered by a huge surplus in the current period. The following equation can be included in the set of other variables that are determinants of primary budget surplus:

$$BS_t = \beta_0 + \beta_{1PD_{t-1}} + \beta_i Z_{it} + \mu_t \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots(3)$$

The current study includes the other determinants (Z) of budget surplus. These are output (GDP), population (POP), financial deepening (MGDP), inflation (INF) and trade openness (TGDP). The study uses Sri Lankan annual time series over the period of 27 years from 1980 to 2017 to analyze public debt sustainability. The author obtained the data from CBSL and the World Development Indicators.

5.2 Nature of the Variable

Budget surplus (BS) refers to the ratio of primary budget surplus/deficit to GDP and public debt (PD) refers to the ratio of debt stock over GDP. GDP means the total amount of all goods and services domestically produced; POP implies the entire population of Sri Lanka; MGDP means the increasing provision of financial services calculated as the ratio of money supply (M2) over GDP. Inflation is the rate of the general level of prices for goods and services. TGDP is the ratio of trade to GDP and calculated as trade (export+import) over GDP. All the variables are taken

in real terms, except population. Thus, the analytical variables are real primary budget surplus/deficit, real public debt stock, real financial deepening, real inflation, real trade openness and population.

5.3 Data Collection

The data have been taken from the Central Bank of Sri Lanka and World Development Indicators. The study used the annual data a for 37 years spreading 1980 to 2017.

5.4 Method of Estimation

Unit Root Test

This study uses time series data, therefore, it is necessary to test the unit root to check whether the data series are stationary or non-stationary to avoid the spurious regression. To test the unit root for stationarity, we use the following first order autoregressive model.

$$X_t = \rho X_t - 1 + \varepsilon_t$$

where εt is the white noise error term. The error term follows the classical assumption of zero mean, non-autocorrelation and constant variance. Under the null hypothesis ρ=1, computed t-statistics are identified as the "T" (tau) statistic, with values tabulated by the Dickey and Fuller test. When Dickey-Fuller test is applied to the above model, it is called the ADF test.

ARDL Bound Test

To test the co-integration among variables, the study uses the Pesaran et al. (2001) autoregressive distributed lag (ARDL) approach. The ARDL method has an advantage compared with the other co-integrations methods because this method can be used for variables that are integrated of different orders. The ARDL bound test is based on the Wald test (F-statistic). If the calculated F-statistic value is higher than the upper bound critical value, then the null hypothesis

is rejected. If the F-statistic is less than the lower bound critical value, then the null hypothesis cannot be rejected. The results of the co-integration are inconclusive if the calculated F-statistic falls between two critical bound values. After confirming the long run relationship by using the above test, error correction model (ECM) is used to estimate the short-run coefficients.

3. Estimation Results

The results of the unit root test presented in Table 4 confirm that all the variables are non-stationary at the level form except the inflation variable on the basis of both ADF and Phillip Peron tests under the constant and constant without trend. The population variable shows mixed results—stationary on the basis of both ADF and PP tests under the constant at the level form, but non-stationary under the constant without trend in both the tests. The results of unit root tests presented in Table 5 confirm that all the variables are stationary at the first difference except inflation which is stationary at level (i.e. I [0]) at the 1 percent significance level. Since the variables of the model are integrated at a different order, this study uses the ARDL method to check the existence of co-integration among variables.

Table 6.3: Results of the ADF Test and Phillip Perron Test (Level Form)

	ADF		Phillip Perron Test		Order of
	Constant	Constant with trend	Constant	Constant with trend	Integration
PS	-5.617***	-6.375***	-5.98***	-6.736***	I(0)
	(0.000)	(0.0000)	(0.0000)	(0.0000)	
PD	-1.783	-0.381	-1.952	-2.401	Ho not rejected
	(0.3824)	(0.3824)	(0.3059)	(0.3727)	
GDP	7.53	0.97	7.53	0.97	Ho not rejected
	(1.0000)	(0.9998)	(1.0000)	(0.9998)	
POP	-1.58	-1.79	-2.28	-1.74	Ho not rejected
	(0.478)	(0.6893)	(0.1823)	(0.7099)	

MGDP	1.013	0.543	0.492	0.317	Ho not rejected
	(0.9959)	(0.9991)	(0.9842)	(0.998)	
INF	-5.008***	-5.391***	-5.009***	-5.399***	I(0)
	(0.0002)	(0.0005)	(0.0002)	(0.0005)	
TGDP	-8.833***	-10.486***	-7.171***	-10.525***	I(0)
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	

Source: Author's Calculations.

Notes ***, **, and * denote the significance level at 1 percent, 5 percent, and 10 percent, respectively

Table 6.4: Results of the ADF Test and Phillip Perron Test (First Difference)

	ADF		Phillip Perron Test		Order of
	Constant	**Constant with trend**	**Constant**	**Constant with trend**	**Integration**
PD	-5.846***	-5.846***	-5.846***	-5.846***	I(1)
	(0.0000)	(0.0001)	(0.0000)	(0.0001)	
GDP	-2.324	-4.329***	-2.139	-4.28***	Mixed
	(0.1702)	(0.0079)	(0.2313)	(0.0089)	
POP	-5.098***	-5.346***	-5.069***	-5.069***	I(1)
	(0.0002)	(0.0005)	(0.0002)	(0.0001)	
MGDP	-4.567***	-4.921***	-4.648***	-4.923***	I(1)
	(0.0008)	(0.0017)	(0.0006)	(0.0017)	

Source: Author's Calculations.

Notes ***, **, and * denote the significance level at 1 percent, 5 percent, and 10 percent, respectively.

Table 6.5: Lag Length Selection criteria for ARDL Bound Test

Lag Order	LR	SC	HQ
0	NA	-6.22	-6.42
1	451.52*	-17.47*	-19.08*

Note: * Indicates lag order selected by the criterion

Table 6 shows the results of the lag length selection criteria. All the three criteria, that is, LR (Sequential modified LR test statistic) SC (Schwarz information criterion), HQ (Hannan- Quinn information criterion) select the one lag order for the VAR model. Therefore, the ARDL co-integration test is done using one lag for the VAR model. Table 7 shows the calculated ARDL bound test results.

Table 6.6: Results of the ARDL Bound Test

Optimal lag length	(1,1)	
F-Statistic	**6.482960**	
Outcome	Co-integrated	
	Lower Bounds (0)	Upper Bounds (1)
10 percent level	2.218	3.314
5 percent level	2.618	3.863
1 percent level	3.505	5.121

The ARDL co-integration test is done by using the four lags for the VAR model. The calculated Wald test F-statistics is 6.482960 that is higher than the upper bound critical value of 5.121 at the 1 percent significance level. That confirms the existence of co-integration among the variables of the model. However, according to Ozkaya (2013), stepwise algorithm procedure for the sustainability of public debt, Sri Lankan public debt is not sustainable during the period under study.

Table 6.7: The Results of the ARDL Long Run Model (1,0,0,0,0,0,1)

Dependent Variable: D (BS)

Variable Coefficient, Standard Error, T-statistics, Probability

Variable	Coefficient	Standard Error	T-Statistics	Probability
PD	-0.084822	0.033367	-2.542083	0.0168

Variable	Coefficient	Standard Error	T-Statistics	Probability
GDP	-6.64	3.31	-2.0055706	0.0546
POP	-5.69	5.94	-0.957471	0.3465
MGDP	0.236201	0.092323	2.558433	0.0162
INF	5.18	4.13	1.255098	0.2198
TGDP	-4.021808	1.284626	-3.130723	0.0041
C	0.00149	0.001294	1.15221	0.259

Table 6.8: ARDL (1,0,0,0,0,0,1) Error Correction Model Results

Dependent Variable: Primary Budget Surplus

Variable	Coefficient	Standard Error	T-Statistics	Probability
PD	-1.110247	0.047286	-2.331505	0.0271
GDP	-8.63	4.57	-1.890184	0.0691
POP	-7.39	7.8	-0.947528	0.3515
MGDP	0.377001	0.12669	2.423252	0.0221
INF	6.73	5.19	1.298373	0.2048
TGDP	-1.031387	0.92159	-1.119138	0.2726
TGDP (-1)	-4.195932	2.362023	-1.776414	0.0865
CointEq (-1)	-1.299744	0.161425	-8.051683	0.0000

Bohn (1998) empirical approach estimates the fiscal reaction function which shows the reaction of the primary balance to changes in the outstanding debt and other control variables.

According to this approach, positive coefficient of the primary balance of debt confirms debt sustainability. The estimated results show both the long-run model and ECM results coefficient of public debt is negative and significant at 5 percent. This result confirms the unsustainability of public debt in Sri Lanka under the study period. The coefficient of GDP is negative and significant at the 10 percent level. This result suggests that a higher output does not increase the tax revenue of the country. Inflation in both long-run and short-run positively impacts the budget surplus. Financial deepening is also positively related to fiscal performances of the country. Bayraktar and Wang (2006) revealed that banking openness may increase investment that impacts economic growth. Both the long-run and short-run model confirms that financial deepening coefficient is positive and significant at 5 percent, effecting fiscal balance in Sri Lanka. The effect of population is negative, but not significant in both models. Trade openness has anegative coefficient in both models revealing that the move towards a more open economy is not beneficial for debt sustainability and better fiscal stability in Sri Lanka.

Diagnostic Test Results

Table 10 shows the diagnostic test results of the model. The Jarque Bera test results show the residuals are normally distributed and Breusch-Godfrey serial correlation LM test suggests that there is no serial correlation problem. Heteroskedasticity test results confirm that residuals are homoskedastic and there is no problem of heteroskedasticity.

Table 6.9: Diagnostic test results

Test	Test statistics	Test value	Probability
Jarqu-Bera Statistic	X2-statistics	0.501384	0.778262
Breusch-Godfrey Correction LM Test	F-statistics	1.985041	0.1703
	X2-statistics	2.533945	0.1114
Heteroskedasticity test	F-statistics	1.031092	0.4367

	X2-statistics	8.419696	0.3936

Figure 6.4: Cusum test for error correction model
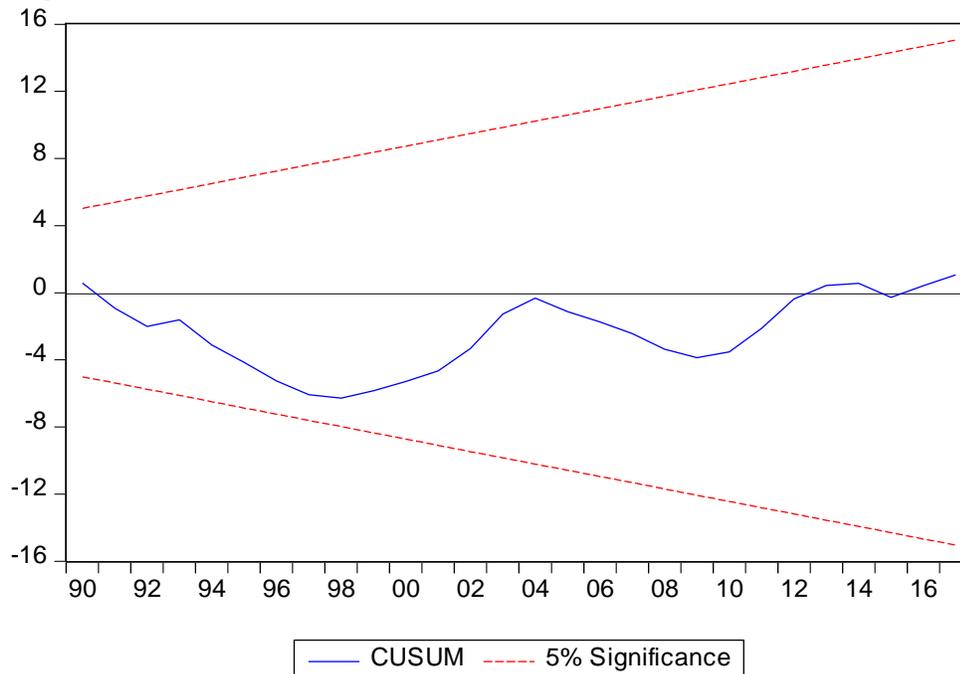
Figure 6.5: Cusum of square plots for error correction model
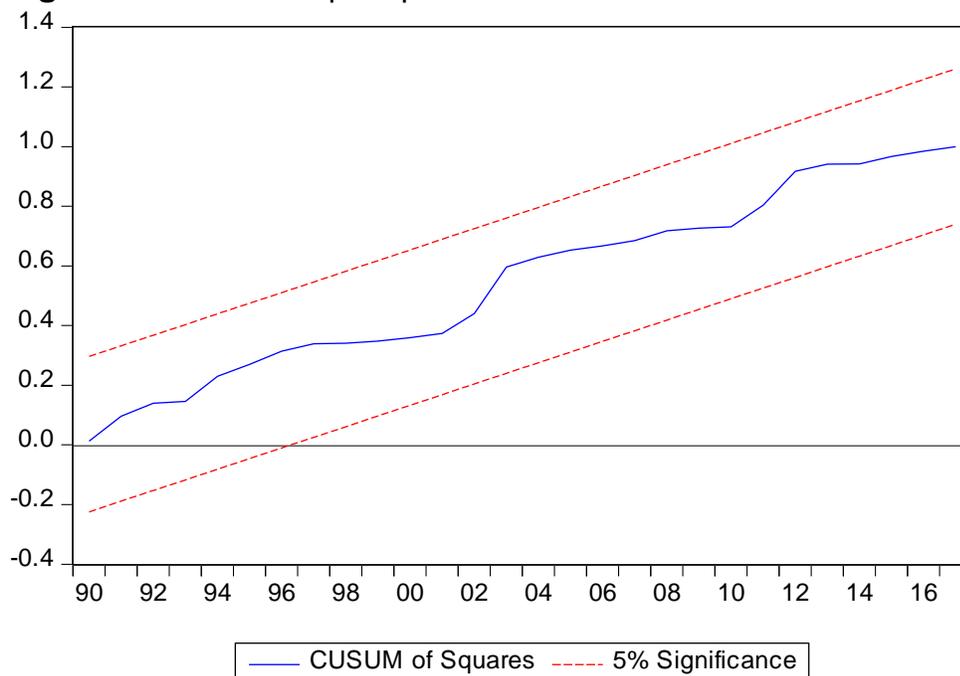
Source: Author's calculations.

The above cusum and cusum of squares plot figures indicate that the residuals movement of the model is within the critical line. This result indicates the stability of the model parameters.

6.7 Conclusions and policy implication

The sustainability of public debt can be achieved by satisfying the intertemporal budget constraint. To analyze the sustainability of public debt in Sri Lanka, the author used the fiscal reaction function approach. According to this approach, debt sustainability can be established through positive, conditional response of the primary balance of public debt. This study analyzed and estimated the sustainability of public debt over the period 1980-2017 in Sri Lanka. The study used the more rigorous time series econometric techniques for the estimation of debt sustainability and introduced some specific policy measures of public debt sustainability. To check the stationarity of the time series data, the study first used the unit root test and the results showed that the series was stationary at different levels. Therefore, the study applied the ARDL cointegration technique to find the long-run relationship among variables. The ARDL bound test results confirmed the existence of cointegration among variables. The ARDL long-run model and the ECM results confirm the unsustainability of public debt in Sri Lanka over the period of 1980-2017.

Chapter Seven

Public Debt Management

7.1 Introduction

Public debt management is the process that establishes the strategies for managing the government debt to raise the required amount of funds at the lowest cost over the medium- to long-term and is also consistent with a prudent degree of risk. It also meets other public debt management goals that have been established by the government, such as to develop or maintain an effective market for government securities or the debt-to-GDP ratio. There are different benefits associated with a good public debt management system within the country. The first is that it helps countries to decrease the borrowing cost in different ways. A well-designed borrowing programme gives confidence to investors and also reduces the borrowing spread. The second is that good public debt management can help to improve the domestic financial market. Furthermore, firms and individuals also benefit for a similar reason. A well-developed domestic market also facilitates the economic development and helps economies to be more resilient to external shocks. The third benefit is that an effective debt management system can decrease the vulnerability to economic and financial shocks.

The management of public debt is the responsibility of section 113 of the monetary law act of the Central Bank of Sri Lanka, and public debt management is mainly conducted through the public debt department (PDD), which manages the issues and services of the public debt on behalf of the government. The treasury engages in the cash management of the government debt raised from the LCBs. More importantly than the issuing and servicing of the domestic debt, the PDD makes service payments for foreign debts. The external resources department of the Ministry of Finance conducts foreign loan negotiations. A large portion of the foreign loans is

raised through the multilateral and bilateral sources and is concessional. The public debt department also works with the foreign debt raised from commercial sources and regulates the primary dealers and maintains a database on public debt, market development activities, and the promotion of investors with regard to government securities.

More than fulfilling the financial gap, government debt plays an important role in the financial and capital markets. It provides the mechanism for the interest rate determination and establishing the yield curve for the securities, and the debt market facilitates the financial and capital market operations. Therefore, debt management becomes an even more important phenomenon. All countries have introduced or are introducing independent debt offices for increased efficiency, prudence, and transparency. The debt securities market development is linked to the financial and capital markets developments of each country. In Sri Lanka, a primary dealer system has been established, and marketable debt instruments, such as the treasury bonds introducing the Scripless Securities Settlement and the Central Depository System have been introduced. These systems are expected to improve based on state-of-the-art technology.

Historically, the responsibility of debt management functions was located in the Central Bank or the Ministry of Finance. Recently, most debt management operations in a country have been transferred from the Central Bank to the Ministry of Finance with the evolution of the functions of the Central Bank. The Ministry of Finance has taken over more responsibilities in conducting effective public financial management. Fiscal policy advisers, debt managers, and the monetary policy authority should communicate and share how these respective policy instruments operate, how policy tension arises, and how they can reinforce one another.

The main objective of public management is to identify the government financing needs and achieve the lowest possible cost for payment obligations with a prudent degree of risk. Prudent

risk management is required to avoid risky debt structures and strategies are crucial to avoid sovereign debt default.

7.2 Legal Framework of Public Debt Management in Sri Lanka

Major legislation governs the management of public debt in Sri Lanka.

(1) The Monetary Law Act (MLA) of 1949, 2002

(2) The Local Treasury Bills Ordinance (LTBO) of 1923, 1953, 1992, 1995, 2004

(3) The Registered Stock and Securities Ordinance (RSSO) of 1937 as amended in 1949, 1983, 1985, 1995, 2004

(4) Foreign Loans Act of 1957, 1962, 1963, 1980, 1984

(5) Treasury Certificates Act of 1957, 1961, 1966, 1981

(6) Tax Reserve Certificates Act of 1957, 1961, 1966, 1981

(7) Fiscal Management (Responsibility) Act of 2003

(8) Annual Appropriation Act

7.3 Borrowing Programme of the Government

The agent of the government Public Debt Department (PDD) has a responsibility to raise the funds to meet the requirements of the government, especially from domestic sources. When preparing the monthly borrowing plan of the PDD, some factors must be considered such as government borrowing needs, maturation of debts via instruments, interest rate in the market, resource availability, and other market developments.

Total Borrowing Plan—2005

RS.Billion

Total Net Domestic Borrowing	**105**
Total Gross Borrowing	**436**
(a) Domestic	331
(b) Foreign	105
Borrowing by Instruments	**436**
Domestic	
(a) Rupee Securities	70
(b) T-bonds	250
(c) T-bills	5
(d) CBSL Advances	6
Foreign	105

Source: Public Debt Management and Debt Profile of Sri Lanka (2004)

Public Debt Operational Network

The quantity of public debt for a given year obtains approval from the Parliament by the Minister of Finance during the country's annual budget presentation. The following are some of the government institutions responsible for raising the approved amount of government debt for a given period:

➢ Government security programme: T-bills, T-bonds, rupee loans raised and managed by the PDD of CBSL

➢ Special debt: Sri Lankan development bonds and floating rate notes raised by the PDD of CBSL

➢ Other loans: Foreign currency bank units raised by the state account's department of treasury.

➢ Overdrafts debt is obtained from commercial banks by the state account's department of the treasury.

Primary dealers bid competitively at primary auctions that are conducted by the PDD for the issue of T-bills and T-bonds. Two auctions are conducted for a week; usually the T-bill auction is on a Wednesday and the T-bond auction is on a Thursday.

Primary dealer network: The primary issue of marketable domestic debt in Sri Lanka opens with a group of dedicated primary dealers. The primary dealers are supervised by the Public Debt Department of the Central Bank.

Organisation of the public debt department

The public debt department is divided into the following divisions according to their responsibilities:

1. Front office
2. Middle office
3. Back office
4. Supervision division
5. Lanka secure and the SSSS division
6. Support services division

Front office—Responsible for the issuing of debt instruments and engaging in different activities including conducting auctions, handling tender information, and sharing the results of auctions with the primary dealers and the public.

Middle office—Responsible for the analysis of debt and risk management.

Back office—Provides service payments on domestic and foreign loans raised by the government and the PDD.

Supervision division—Conducts off-site surveillance and on-site examination activities by the primary dealer to confirm that the primary dealer system works in an efficient, safe,

transparent, and sound manner.

Lanka secure and the SSSS division—Maintains the central depository system and documentation of secondary market transactions.

Support services division—Provides support services to continue activities with the other divisions.

7.4 Risk Management in Public Debt

Management of Risk: Minimising risk is one of the main objectives of debt. The following are the main risks faced by the issuer and/or PDs.

Market Risk: Market risks are related to market price changes such as commodity price, interest rates, exchange rates, and public debt servicing costs.

Rollover Risk: The rollover risk is the chance that the money will rollover at an unusually high cost or, in exceptional cases, cannot be rolled over.

Liquidity Risk: Liquidity risk can be divided into two parts. One refers to the cost or the penalty that must be paid by the investors. The other liquidity risk of a borrower is that the volume of liquid assets can be quickly decreased.

Credit Risk: Credit risk refers to the non-performance risk by borrowers on loans, other financial assets, or financial contracts.

Settlement Risk: This refers to the potential loss suffered because of the failure to settle with the government as a counterparty.

Operational Risk: Operational risk consists of the different types of risks such as transaction errors, inadequacies or failure in internal controls, legal risk, reputation risk, or natural disasters that impact business activities.

7.4 Debt Management Indicators in Sri Lanka

There are different indicators that reflect the cost and degree of the risk of borrowing that are used to accomplish prudential debt management. The domestic market borrowing cost is calculated using the yields of debt instruments. Most Sri Lankan foreign loans are concessional and have been sourced from bilateral and multilateral agencies, and interest costs of foreign loans are low. The following table shows some of the debt indicators in recent years that are important for debt management.

Table 7.1: Key Debt Indicators

Indicator	2015	2016	2017	2018
Government Debt/GDP	77.7	78.3	76.9	82.9
Domestic Debt/GDP	45.3	44.5	41.7	41.6
Foreign Debt/GDP	32.4	33.7	35.2	41.2
Total Foreign Debt/Exports	154.0	159.3	162.2	181.0
Total Debt Service/GDP	12.0	11.3	11.9	14.5
Total Debt Service/Government Revenue	90.6	80.2	87.5	108.8
Domestic Debt Service/Government Revenue	63.1	62.7	66.3	81.3
Total Debt Service/Government Expenditure	42.5	44.0	46.6	53.1
Domestic Debt Service/Government Expenditure	29.6	34.4	35.3	39.7
Foreign Debt Service/Exports	17.4	11.6	13.4	16.0
Total Interest/GDP	4.7	5.1	5.5	5.9
Domestic Interest/GDP	3.6	4.0	4.3	4.4
DomesticInterest/Government Recurrent Expenses	23.2	27.5	29.6	30.6
Foreign Interest/Exports	5.0	5.0	5.7	6.5

Source: Minister of Finance, Central Bank of Sri Lanka, Department of Census and Statistics

Chapter Eight

Overall Findings, Conclusions and Recommendation

8.1 Overall Findings and Conclusions

The sustainability of public debt can be achieved by satisfying the intertemporal budget constraint. To analyze the sustainability of public debt in Sri Lanka, the author used the fiscal reaction function approach. According to this approach, debt sustainability can be established through positive, conditional response of the primary balance of public debt. This study analyzed and estimated the sustainability of public debt over the period 1980-2017 in Sri Lanka. The study used the more rigorous time series econometric techniques for the estimation of debt sustainability and introduced some specific policy measures of public debt sustainability. To check the stationarity of the time series data, the study first used the unit root test and the results showed that the series was stationary at different levels. Therefore, the study applied the ARDL cointegration technique to find the long-run relationship among variables. The ARDL bound test results confirmed the existence of cointegration among variables. The coefficient of public debt is negative and 5% significant level in the long run and error correction models. According to the Bohn (1998) this shows the unsustainability of public debt of Sri Lanka. The ARDL long-run model and the ECM results confirm the unsustainability of public debt in Sri Lanka over the period of 1980-2017. The coefficient of GDP is negative as expected and significant at the 10 percent level in the long run and short run. This result suggests that a higher output increases the revenue of the country and that impact to reduce the budget deficit. Population coefficient shows the positive and insignificant relationship as expected in the long run and short run. Trade openness shows the negative coefficient as expected and 1% significant in the long run revealing

that the move towards a more open economy is beneficial for debt sustainability and better fiscal stability in Sri Lanka. As expected the inflation coefficient is positive and insignificant in both long-run and short-run. Financial deepening is also shows the positive and 5% significant level in both the long run and short run in coefficient reveled that the banking openness in not positively impact to the better fiscal stability and debt sustainability in Sri Lanka.

The fiscal reaction function of the time series data of Sri Lanka that confirms the fiscal policy measures during the period under study were not appropriate in maintaining fiscal solvency and debt sustainability. GDP, Population and the trade openness are important areas that can maintain the fiscal solvency which requires special attention of the policy makers in the country. Many factors that affect increase the public debt in Sri Lanka specially, terrorist war in past decades, the declining trend of the government tax revenue, increase the government expenditure, declining the official development assistance (ODA) from donor countries and poor debt management system in Sri Lanka.

Furthermore current study also examined the crowding-out effect of public borrowing on private investment in Sri Lanka. The results of the study confirm that there is no crowding-out effect in Sri Lanka from public borrowing. Our estimated results show that when public borrowing from domestic sources is increased, it positively impacts private investment in Sri Lanka. This indicates an absence of the crowding-out effect due to public borrowing from domestic sources. To test reverse causality, we used the Granger causality test, and the results show that private investment can affect GDP and public borrowing in Sri Lanka. There are few findings supporting this positive effect of public borrowing on private investment from a macroeconomic point of view. To examine this topic from this perspective, we analysed

macroeconomic issues and identified factors such as the employment of effective monetary policy by the government to mitigate the crowding-out effect, liberalisation of the financial market, and increased foreign remittances in the recent decades, to show that there is a crowding-in effect rather than a crowding-out effect in Sri Lanka.

The absence of a crowding-out effect emphasises the possibility that governments can finance budget deficits through domestic sources without influencing private investment. This shows that the Central Bank of Sri Lanka has successfully mitigated the crowding-out effect of public borrowing from internal sources through an accommodative monetary policy. Liberalisation in the financial markets effects monetary expansions through short-term capital inflows. Therefore, the Sri Lankan government changed its method of borrowing from conventional foreign lenders to some emerging lenders. During the last few decades, this has increased the foreign remittances of the country, and it appears to have eased constraints. This indicates the ability of the Sri Lankan government to employ an accommodative monetary policy to decrease the negative impacts of government borrowing from domestic sources.

The calculated results shows the Private investment in Sri Lanka does not seem to be very sensitive to interest rates (Chowdhary, 2004), but it does react strongly to public investment and the demand expectations. Public investment represented the main factor in determining private investment in the long run and demand expectations, represented here by the GDP are a main factor in determining private investment in the short run in Sri Lanka. The theory of investment in conditions of uncertainty was backed by the fact that the statistical insignificance of the interest rate coefficient in both the long run and short run.

8.2 Policy Recommendation

The absence of the crowding out effect, that emphasizes the possibility of the government finance the budget deficit through the domestic sources without influencing to the private investment. Also possible to apply the such Keynesian-type demand management policies in Sri Lanka as the economy has been operating well below the its full employment level.

The ARDL long-run model and the ECM results confirm the unsustainability of public debt in Sri Lanka over the period of 1980-2017. Therefore, government is for priority projects funded through borrowed money that generate high returns. Furthermore, as emphasized in Abdul (2016), the policy makers should consider the movement of ratio of both surplus and debt to GDP. If the debt to GDP ratio is rising while surplus to GDP ratio is falling, the government should take some fiscal policy instruments to increase the surplus to GDP ratio so that the public debt sustainability is maintained.

As also stated in Deyshappria (2012), the reduction of the budget deficit would constitute an important fiscal adjustment measures towards a more sustainable deficit. The adjustment can be made in mainly two ways: Increased tax revenue and decreased government expenditure. However, increasing tax revenue will become the difficult task because the inelastic nature of the tax base in Sri Lanka. So, the government can improve the tax administration, introducing new tax and introduce the broad tax system. Although the revenue could be increased through the taxes, there will be a limited opportunity because higher taxed reduce the private sector participation in the production activities.

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