

Twin Deficit Hypothesis: The Case of Sri Lanka

by

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ABSTRACT

The relationship between current account balance and fiscal balance in Sri Lanka between 1960 and 2022 is examined using annual data. Stationarity of data series was checked using the Augmented Dicky Fuller Test and the Philips – Perron Test. In order to investigate the long run relationship between current account balance and fiscal balance, the autoregressive distributed lag (ARDL) model and bound tests is applied. Under an ARDL model a bound test provides statistical evidence of a long run relationship between the current account balance and fiscal balance. Error correction form of the ARDL model shows that fiscal balance and GDP growth rate have a statistically significant impact on the current account balance in the long run. The Granger causality test provides evidence that the direction of causality ran from the budget deficit to the current account deficit. Recommendations for improving the current account balance by improving the fiscal balance and changing the growth trajectory of Sri Lanka are discussed.

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1.0 INTRODUCTION

1.1 Background

The post-independent economic history of Sri Lanka has been frequently plagued by economic crises. These culminated in a full-blown sovereign debt crisis in 2022. These crises have been associated with twin deficits: a deficit in the fiscal balance that moves in parallel with the deficit in the external current account. In this text fiscal balance is defined as the government revenue minus government expenditure. The current account balance is defined as the net exports plus net factor income and net transfers from abroad. This report covers the period between 1960-2022. We will see how the fiscal balance and current account balance interacted with each other through the channels of the money supply, the exchange rate, interest rates, inflation, economic growth, international trade, and international financial flows. External factors such as the first and second oil shock, recessions in major export destinations, and the covid pandemic also had a major impact on the Sri Lankan economy in terms of both the fiscal balance and current account balance. Large budget deficits have been the hallmark of the post independent Sri Lankan economy. Public welfare expenditures, public investments, national defence expenditure, tax policies and state-owned enterprises accounted for these large fiscal deficits in different periods of time. Public welfare expenditure between 1948-1978 and public investments between 1978-1989 and 2005-2014 also directly impacted the current account balance. The Central Bank of Sri Lanka (hereafter denoted “CBSL”), which was established in 1950, played a significant role in financing the budget deficit, and thereby contributing to the inflation.

Trade policies of Sri Lanka have swung back and forth between inward looking, import substitution policies to outward looking export promotion policies. In a World Bank Macroeconomic Studies series Athukorala and Jayasinghe (1994, p.12) points out that inward looking economic policies were pursued after independence more out of necessity than out of conviction in order to save the dwindling foreign assets. But once the government realized that import substitution policies only led to shortages and slow economic growth, outward looking policies were adopted (Athukorala and Jayasinghe, 2013, p.7). External economic policies have alternated between discouraging international financial flows in the form of foreign investments/external debts to incentivizing them. These policies directly impacted the current account balance. Even though the government after 1978 actively encouraged foreign investments, it never took off in Sri Lanka. External debts that were used to finance the fiscal deficit and current account deficit were the root cause of the sovereign debt crisis that erupted in 2022.

The ebbing and flowing of the international financial flows directly influenced the exchange rate. After 1978, the government adopted a flexible exchange rate regime which was intended to be used as a policy tool to encourage exports. But the de facto exchange rate regime remained closer to a fixed regime than to a flexible regime. The lax fiscal policies of the government did not support the fixed exchange rate regime. The CBSL often had to either directly finance the fiscal deficit or intervene in the treasury auctions after 1978 to prevent the treasury yields from going up. These actions gave rise to real currency appreciation through monetary expansion, thereby adversely affecting the current account balance. The CBSL often attempted to avert the depreciation of the currency by running

down its foreign reserves. It only devalued the currency once it was in the middle of a balance of payment crisis which was followed by seeking an International Monetary Fund bailout. For these reasons, balance of payment crises Sri Lanka faced were often associated with high fiscal deficits.

All administrations in Sri Lanka after independence wanted to pursue growth enhancing policies. Administrations between 1948-1977 emphasized equity through wealth redistribution as well as the economic growth (Snodgrass, 1974). Some administrations thought that state should play an active role in the economic growth and either established new state-owned enterprises or renationalized already privatized state-owned enterprises as part of this policy. Meanwhile other administrations either actively privatized state-owned enterprise or limited the role of the state-owned enterprises giving more space to the private sector. Frequent budgetary transfers to the state-owned enterprises not only gave rise to large fiscal deficits, but also sapped the energy out of the economy leading to modest economic growth rates even when the economy was going through favourable periods. Except between 2010-2012, Sri Lanka has never achieved stellar economic growths. In a policy paper published by UNDP regional bureau for Asia and the Pacific, Athukorala and Wagle (2022) have shown that even when Sri Lanka achieved significant economic growth, it was based on the growth in the non-tradeable sector rather than on the tradeable sector. Non tradeable sector included construction, utilities such as electricity, gas, water and wastewater treatment and other non-tradeable services. Other non-tradeable services included transport, storage and communication, wholesale and retail trade, banking insurance and real estate, ownership of dwellings, public administrations and defence. This kind of economic growth worsened deficits in

the current account. The economic growth between 2010-2012 was powered by external debts, a significant proportion of which had been obtained from the international capital markets. Unlike bilateral or multilateral debts, debts from international capital markets came with no conditionalities attached. The only drawback was the higher interest rates and bullet repayment compared with concessional debts. Economic growth underlain by growth in the non-tradeable sector eventually led to repayment difficulties, as this growth did not generate foreign assets.

Internal events outside the economic policies also played a major role in creating a link between the current account and fiscal account. The most prominent event among these is the civil war that lasted between 1983-2009. Civil war necessitated increased defence spending giving rise to large fiscal deficits and current account deficits through increased imports. Civil war disincentivized foreign investments and diverted budgetary resources away from infrastructure investments, thereby affecting future economic growth. For a brief period, it seemed that the Sri Lankan economy was ready to take off after the end of civil war. After 2012, this optimism gradually evaporated and was replaced by caution when the economic growth started slowing. Panic started setting in following the tax policy change which had been adopted ostensibly to revive the slowing economy but ended up causing large fiscal deficits which paved the way for international capital markets to lose in confidence in Sri Lanka. Amid covid pandemic, government was left with no choice, but monetary financing to close the gaping fiscal deficit. CBSL tried to keep interest rates down through monetary expansion and also tried to keep the exchange rate fixed through sale of foreign reserves. Amid rising inflation, growing black market for

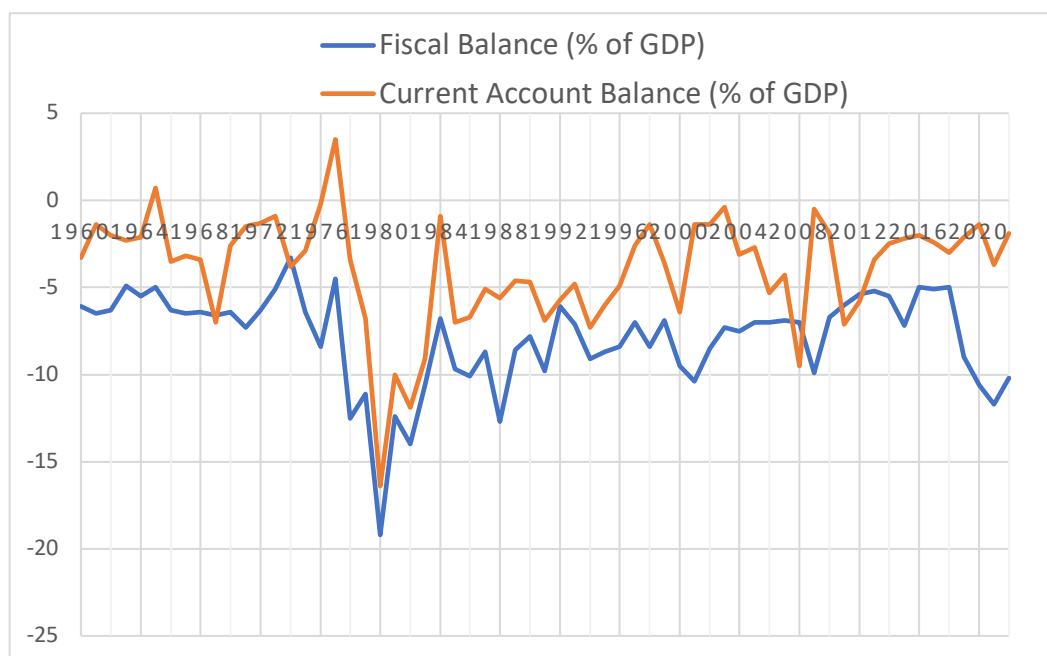
foreign currencies, and depleting foreign reserves, Sri Lanka was forced to declare a moratorium on the servicing of external debts.

Based on fiscal policies, trade policies, foreign investment policies, exchange rate policies and monetary policies period between 1960-2022 have been divided into 5 sub-periods. In each period above mentioned policies will be analyzed in order to understand the link between fiscal balance and current account balance.

1. 1956-1977. Increasing import and currency controls and increasing intervention of the state in the economy.
2. 1977-1989. Partial lifting of import and currency controls. State still continued to play a dominant role in the economy.
3. 1990-2004. Start of the privatization program. Change of government in 1994 did not derail the privatization program.
4. 2004-2015. Disillusionment with the privatization program led the government again to pursue dirigisme policies.
5. 2015-2022. Feeble attempts made between 2015-2019 by the government to reduce the budget deficit and current account deficit ended in failure. New government that came to power in 2019 reversed the stabilization program and led Sri Lanka to its first default in its post independent history.

The following chart shows the trajectory of the fiscal and current account balances between 1960 and 2022.

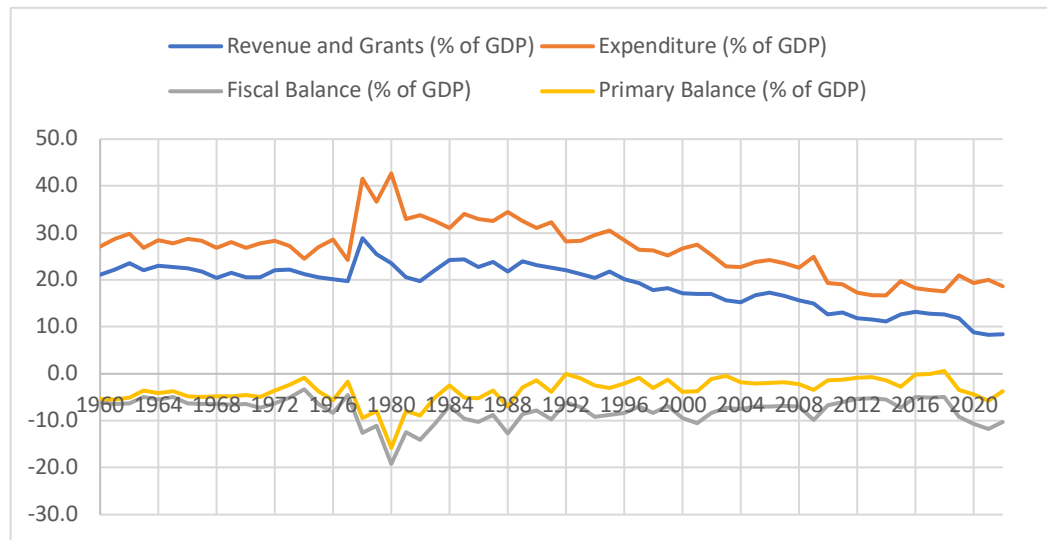
Figure 1. Fiscal Balance and Current Account Balance as a Share of GDP in Sri Lanka



Above figure shows that there is a co-movement between the current account and fiscal balances. The average fiscal deficit and current account deficit between 1960 and 2022 are 7.9% and 3.9% of GDP respectively. The number of IMF programs Sri Lanka entered into bears testimony to the frequency of balance of payment crisis the Sri Lankan government had to contend with. The origin of the balance of payment crisis lay in inadequate inflows into the financial account to cover the current account deficits. Balance of payment crises in Sri Lanka have often been associated with large fiscal deficits. Out of the 16 IMF programs, Sri Lanka managed to complete only 9 programs. This goes on to show the difficulty of implementing meaningful economic reforms which address the issue of persistent twin deficits. Sri Lanka entered into its 17th IMF program in March 2023, followed by the government's announcement of the suspension of external debt servicing in April 2022.

The trajectory of the fiscal balance was very similar to the path of primary balance between 1960-2022. The striking feature of the trajectory of total government revenue, a large proportion of which consisted of tax revenue, has been the steady decline of total government revenue. Tax revenue which was 16.6% of GDP in 1960 gradually decreased to 7.2% of GDP by 2022. This steady decline of tax revenue as a share of GDP played a significant role in Sri Lanka's fiscal deficit which eventually led to a debt crisis in 2022.

Figure 2. Trajectory of Government Revenue, Expenditure, Fiscal Balance and Primary Balance



1.2 1956-1977 Period

At the time of independence in 1948, Sri Lanka had a thriving economy based on export oriented commercial crops dominated by tea, rubber and coconut (Kelegama, 2000, p.1477). In 1950, Sri Lanka's gross official reserves covered 9.3 months of imports. Social welfare programs inherited from colonial rulers which included healthcare, education and food subsidies, were expanded after independence. In order to fund this expansion of the welfare system, post independent governments started taxing the export revenue from the commercial crops, which colonial rulers had left out of the tax net (Moore, 2017). Moore

(2017) describes how the post independent governments failed to develop other revenue sources such as personal income tax and corporation tax on businesses catering to the domestic market. Government revenue averaged 21.5% of GDP during 1960-1977 period while the average government spending was 27.5% of GDP.

Government's welfare expenditure put pressure both on the government's fiscal balance and country's current account balance. Athukorala et al (2017) note that these welfare programs were nearly universal. Average fiscal deficit and current account deficit between 1960-1977 was 6.0 and 2.1 respectively as a share of GDP. Athukorala and Jayasinghe (1994) have shown that expenditure on health, education and food comprised 30%-45% of total government expenditure. Successive governments between 1948 and 1977, unable to control these welfare expenditures, resorted to import controls and currency controls beginning from 1961 (Snodgrass, 1974). These import and currency controls were combined with import substitution economic policies, which adversely affected Sri Lanka's balance of payments.

The trajectory of the current account balance and trade balance have been parallel to each other during the study period. Between 1960 and 1977, average share of exports and imports of goods and services in the GDP was 25.4% and 27.9% respectively. This share increased to 28.5% and 41.0% respectively between 1978 and 1989 following trade reforms in 1978. The following chart shows the path of the exports and imports of goods and services as a share of GDP. The trade dependence ratio, which is defined in this report as the combined share of exports and imports in GDP which averaged 53.3% of GDP during 1960-1977 period increased to 69.5% of GDP during 1978-1989 period. Export taxes on major exports, lack of foreign investment on plantations and import controls meant

that international trade played a diminishing role in the domestic output between 1950-1970. Increasing share of imports and exports in the GDP between 1970-1977 was driven by increase in prices, not in volumes.

Figure 3. Trajectory of Current Account and its Components

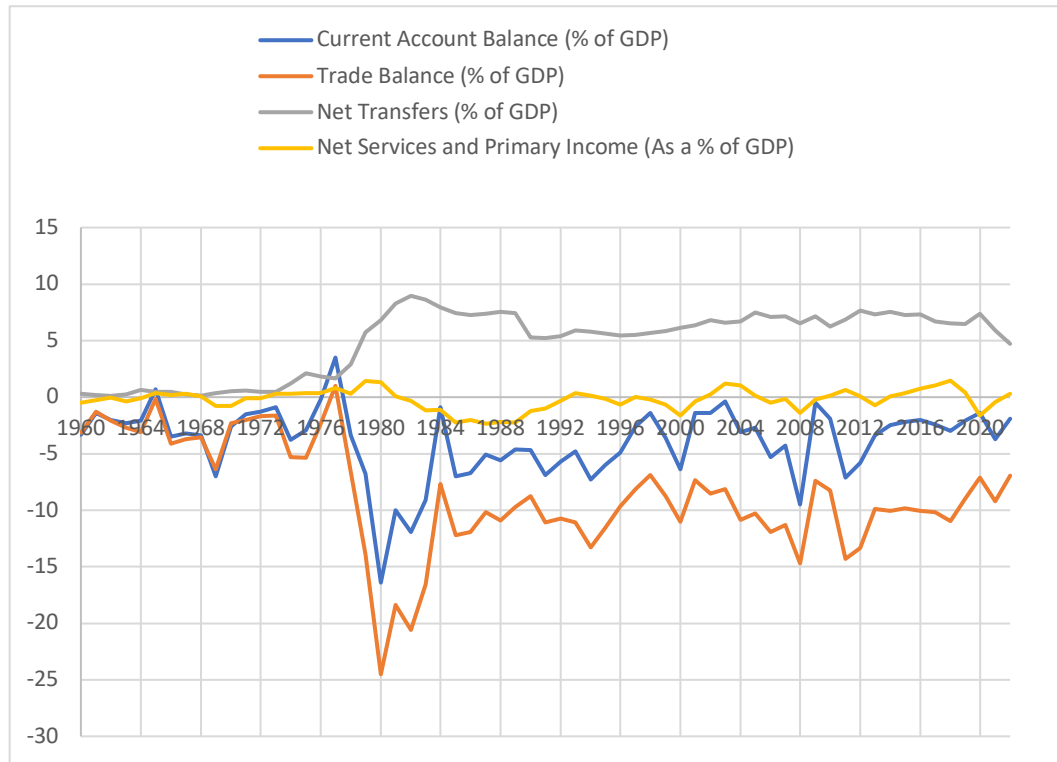
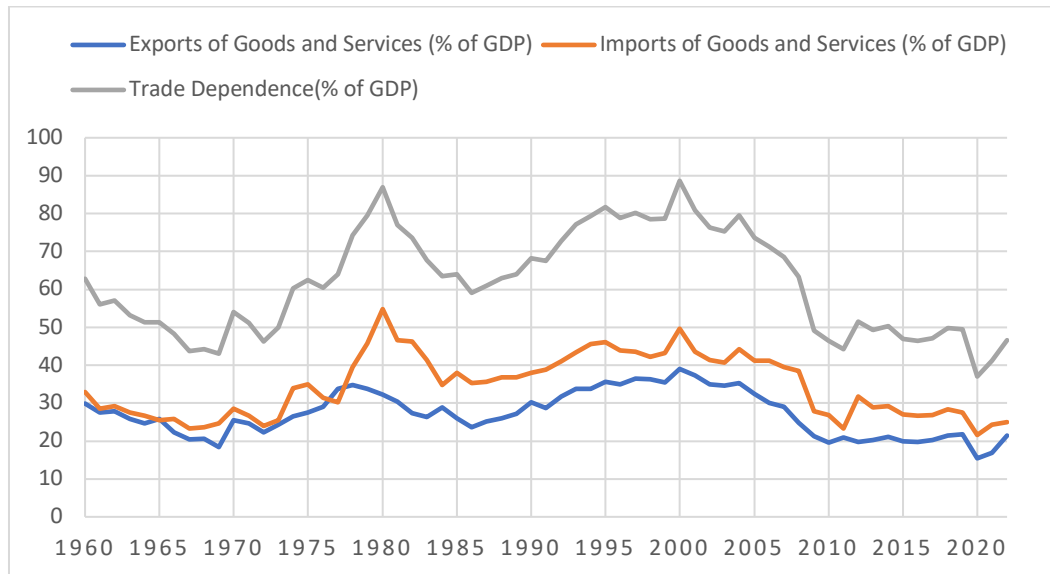


Figure 4. Exports and Imports of Goods and Services as a Share of GDP



Between 1956 and 1977, the government nationalised many private companies, some of which were foreign owned, and established state-owned enterprises in order to carry out import substitution policies. Business activities of these state-owned enterprises (SOE) spanned many sectors in the economy such as transportation, energy, banking, insurance, agriculture and manufacturing. The state-owned enterprises that were engaged in export-oriented agriculture such as tea, rubber and coconut, failed to increase output even when the international prices for those commodities were high. Industrial SOEs failed to produce output for the international market, but increasingly relied on imported inputs to produce their output (Cuthbertson and Athukorala, 1991). Both of those scenarios directly contributed to the current account deficit.

Between 1948 and 1977, Sri Lanka received negligible amount of foreign direct investment. In fact, foreign direct investments were negative in some years during this period, suggesting that foreign owners were divesting of their business interests in the country. As a result, average foreign direct investment during 1960-1977 period was a

negative 0.02 as a share of GDP. Looming threat of expropriation, which became a reality in 1960s and 1970s, stringent import controls and currency controls largely contributed to this situation.

Foreign assets as a share of GDP, which were at 8.1% in 1960, marginally increased to 8.7% of GDP by 1977. Meanwhile external debts as a share of GDP, which stood at 4.4%, steadily increased to 20.9% of GDP. Foreign assets exceeded the external debts until 1964. Persistent current account deficits, low foreign investments and low economic growth rates contributed to the steady rise of external debts as a share of GDP. Persistent current account deficits combined with capital controls contributed to the decline in the foreign assets as a percentage of GDP. Without much recourse to foreign borrowing, foreign aid and foreign investments to finance the current account deficit, government was forced to continue with the currency and import controls.

Figure 5. Foreign Direct Investment as a Share of GDP

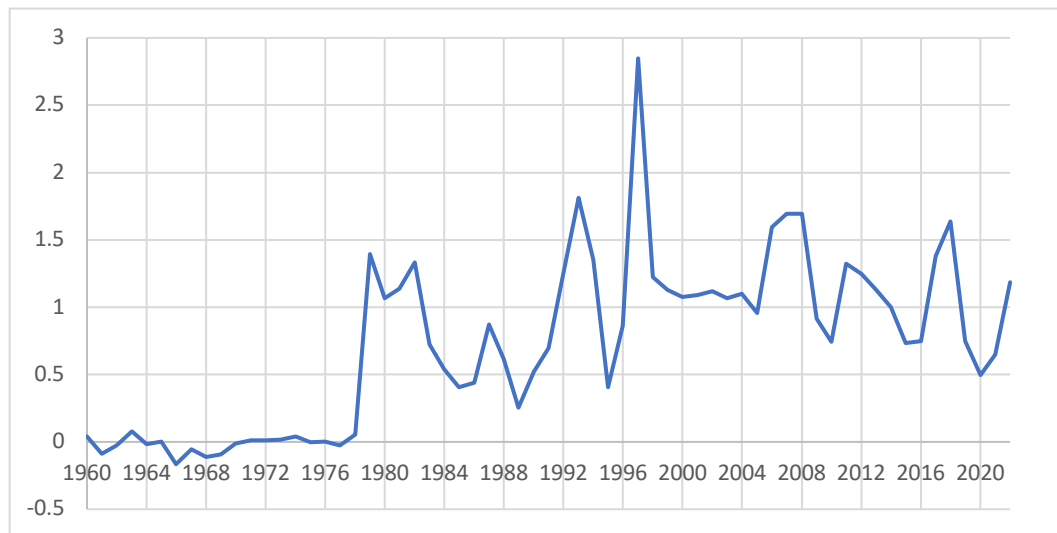


Figure 6. Total Foreign Assets and Total External Debts as a Share of GDP

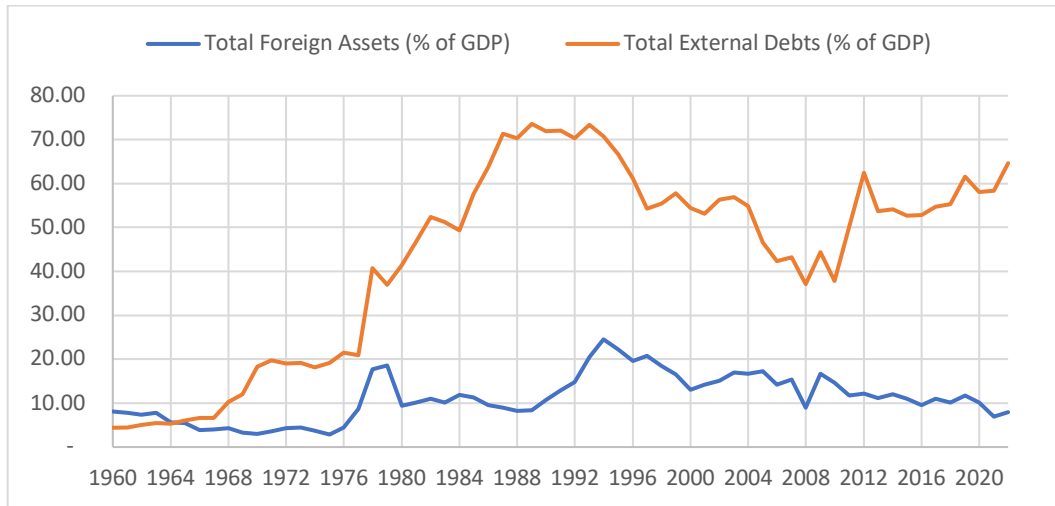
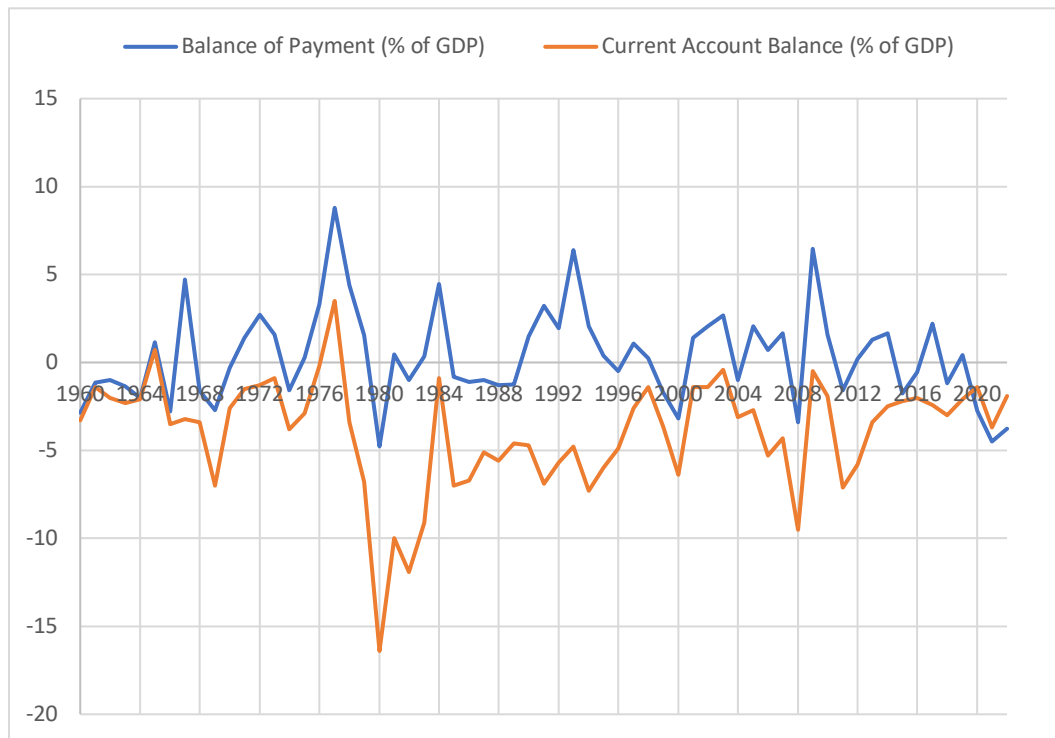
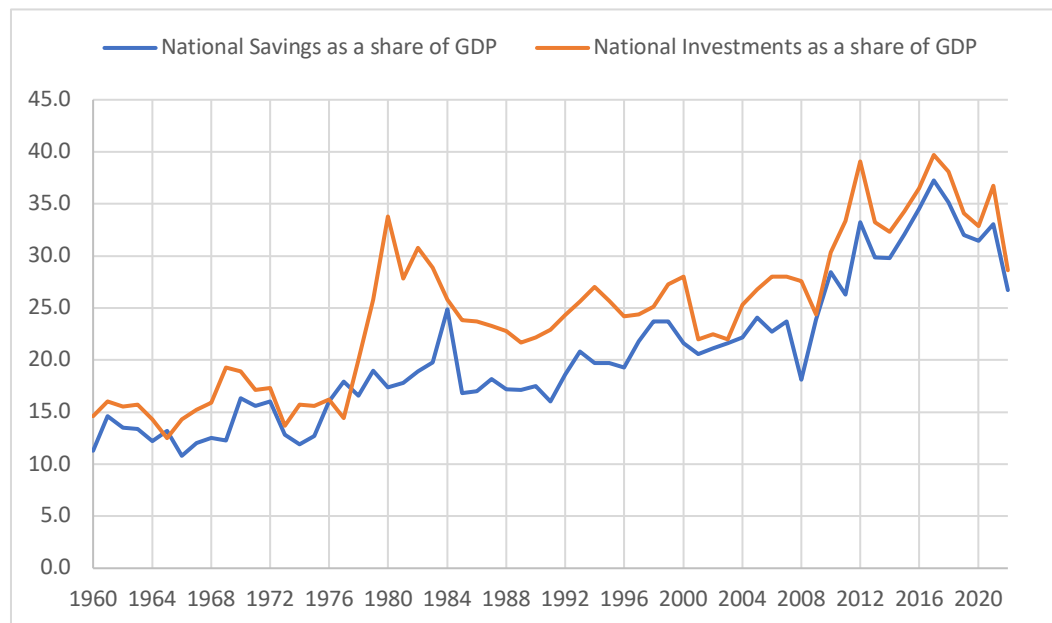


Figure 7. Balance of Payment Position (% of GDP)



Athukorala and Rajapathirana (1991) have described how the financial repression, which helped the government finance its deficit, incentivized financial disintermediation. This financial disintermediation combined with an extensive welfare program of the government meant that national savings were low. Between 1960 and 1977, the average national savings as a share of GDP was only 13.6%. Due to reasons described earlier there was no large flow of foreign savings into the country in the form of borrowings, development assistance or foreign investment. The average national investment was only 15.7% as a share of GDP. Following the lifting of direct controls on commercial bank interest rates as part of the economic reforms in 1978, financial intermediation increased, and commercial bank real interest rates became positive. As a result, national savings increased (Athukorala and Rajapathirana, 1991). The average national savings between 1978-1989 increased to 18.4% as a share of GDP. Increased national savings and foreign savings resulted in higher national investments between 1978-1989. Average national investment was 25.7% as a share of GDP during this period.

Figure 8. National Savings and Investment as a Share of GDP



The average nominal growth rate of monetary base between 1960 and 1977 was 10.3% which was greater than the average economic growth rate of 4.3% during that period. The nominal interest rates as indicated by the end of year 91-day bond yield increased from 2.6% to 9.0% during 1960-1977 period with the average yield being 4.1%. With low economic growth rates and low nominal interest rates, high rate of monetary base expansion led to the increasing inflation. Average inflation rate which was 1.1% between 1960-1969 increased to 7.1% between 1970-1977. It should be noted that first oil price shock in 1973 and stringent import controls also contributed to the increase in inflation between 1970-1977. Monetary expansion was mainly caused by the financing of the fiscal deficit.

Figure 9. Inflation Rate, Real Interest Rate and 91 Day Treasury Bill Yield (Year End)

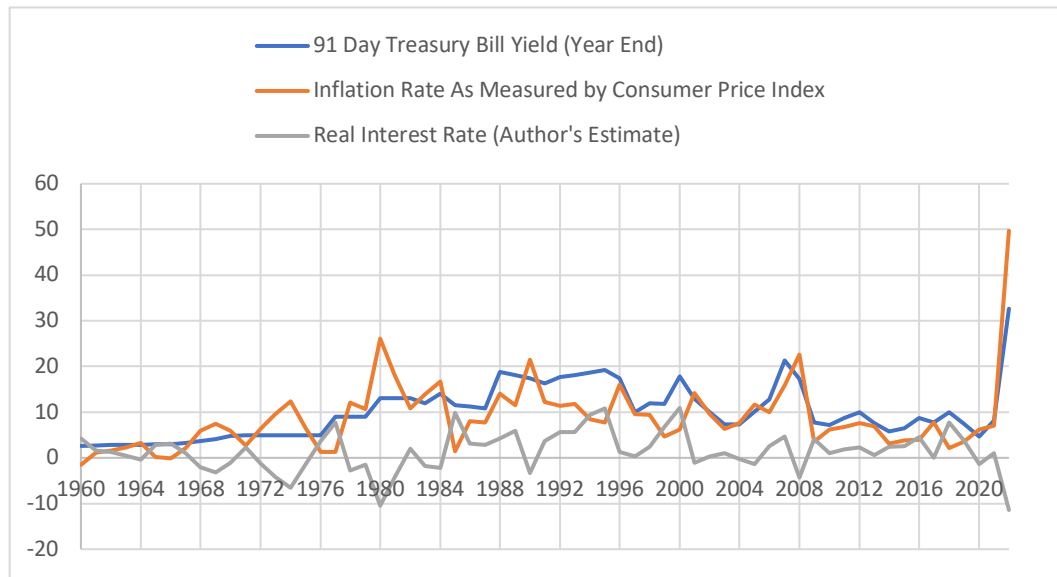
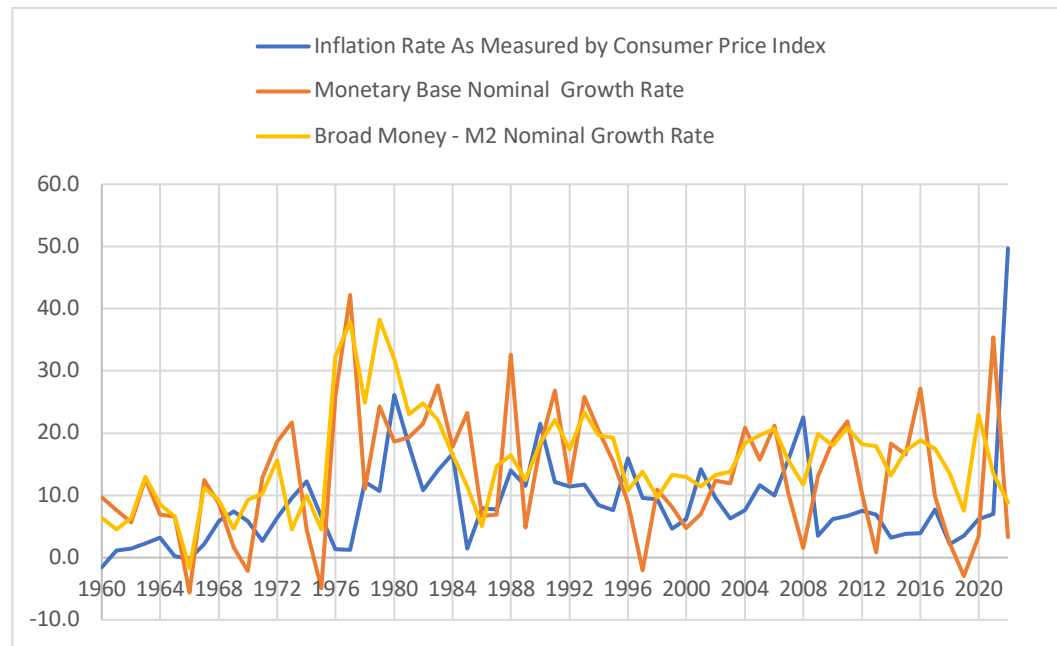


Figure 10. Money Supply and Inflation Rate



1.3 1977-1989 Period

In 1978, the government made a radical break from the past policies of import substitution and implemented policies of export promotion. Under an economic reform program implemented in 1978, the government curtailed welfare programs, started promoting foreign direct investment and lifting import and currency controls. In order to avoid any potential popular discontent caused by cuts to its popular welfare programs, the government started a massive public investment program (Athukorala and Jayasuriya, 1994). The government was incentivized in these economic reform programs by the unprecedented flow of foreign aid (World Bank, 2004). High economic growth rates recorded between 1978 and 1982 made the cuts to the welfare program palatable to the public (Kelegama, 2000). Following table compares the averages of selected economic indicators between the two period.

Table 1. Comparison of Selected Economic Indicators between 1960-1977 and 1978-1989

Period Averages	1960-1977	1978-1989
Fiscal Deficit (% of GDP)	6.0	11.4
Current Account Deficit (% of GDP)	2.1	7.3
National Savings (% of GDP)	13.6	18.4
National Investments (% of GDP)	15.7	25.7
Economic Growth (%)	4.3	4.5

Inflation Rate (%)	3.8	12.6
Trade Dependence Ratio (% of GDP)	53.3	69.5
Foreign Direct Investments (% of GDP)	-0.02	0.74
Monetary Base Nominal Growth Rate (%)	10.3	17.8
Year End 91 Day Bond Yield (%)	4.1	12.8
Real Interest Rate (%)	0.44	0.41

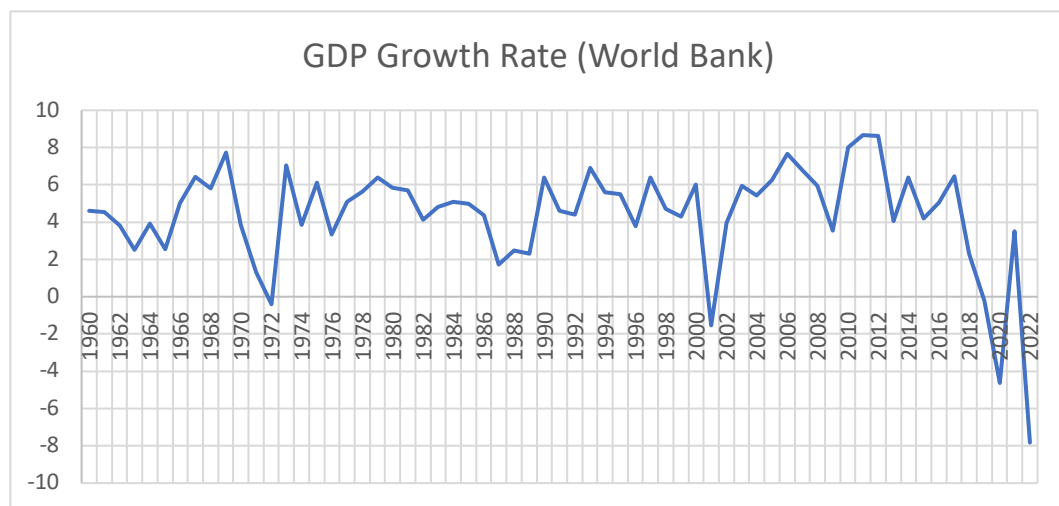
Compared to 1960-1977 period, fiscal deficit, current account deficit, and inflation rate worsened during 1978-1989 period, whereas national savings, national investments and economic growth improved. Economic policies pursued during this period should be analysed to understand worsening of current account and fiscal balance.

The massive public investment program initiated during this period put tremendous pressure on the government budget and the current account. Effect of massive public investment program on the fiscal balance and on the current account balance was amplified by the escalation of prices of imports following the second oil price shock in 1979. In fact, Sri Lanka recorded a fiscal deficit of 19.2% and current account deficit of 16.4 % of GDP in 1980. This is the largest fiscal and current account deficit Sri Lanka has experienced up to now after independence in 1948. Average fiscal deficit and current account deficit increased to 11.4% and 7.3% of GDP between 1978-1989.

Although Sri Lanka faced a balance of payment crisis in 1980, it did not develop into a sovereign debt crisis due to low debt and debt service ratios compared with 2020 and 2021. Continued financial support from international organizations and foreign governments also helped avert a sovereign debt crisis.

Economic growth rate averaged 5.9% between 1978 -1982. Civil war which erupted in 1983 severely impacted the pace of the economic reform program (Kelegama, 2000). Economic growth rate slowed down to a trickle of 3.7 per year between 1983-1989. These summary statistics show that even though Sri Lanka was able to achieve higher economic growth rates immediately following economic reforms in 1978, its fiscal deficit and current account deficit also significantly went up between 1978-1989.

Figure 11. Annual GDP Growth Rate

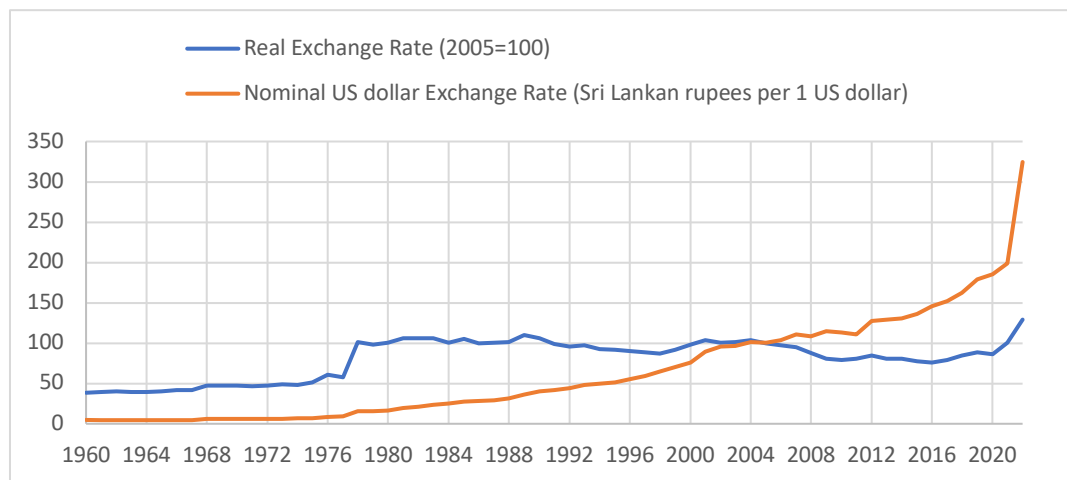


The average monetary base expansion rate between 1978-1989 was 17.8% which was greater than monetary base expansion rate between 1960-1977. The main reason behind this high growth rate of monetary base was the financing of the larger fiscal deficits by the central bank and purchase of foreign currencies from the massive foreign currency inflows into the country. In order to control the inflation, interest rates were allowed to increase

following the reforms in the financial sector in 1977. Even with higher interest rates, average inflation rate between 1978-1989 remained high at 12.6%.

Athukorala and Jayasuriya (1994) notes that government started using exchange rate devaluation in order to promote exports following economic reforms in 1978. Until then exchange rate devaluation was never utilized as a deliberate policy tool to respond to the external sector disequilibrium during the period between 1948 and 1977. Higher inflation rate than the inflation rate of trading partners meant that local currency was overvalued at official exchange rate under the fixed exchange rate regime during 1960-1977 period. As part of the economic liberalization policies, exchange rates were unified in 1977. Floating of the Sri Lankan rupee was abandoned in November 1982 following increasing intervention of CBSL in foreign currency market (Khatri et al, 2017). Between 1978-1989 Sri Lankan rupee underwent a depreciation of 130.9 % in nominal terms, but the real depreciation in relation to the US dollar was only 9.1% for the same period.

Figure 12. Nominal and Real US Dollar Exchange Rate

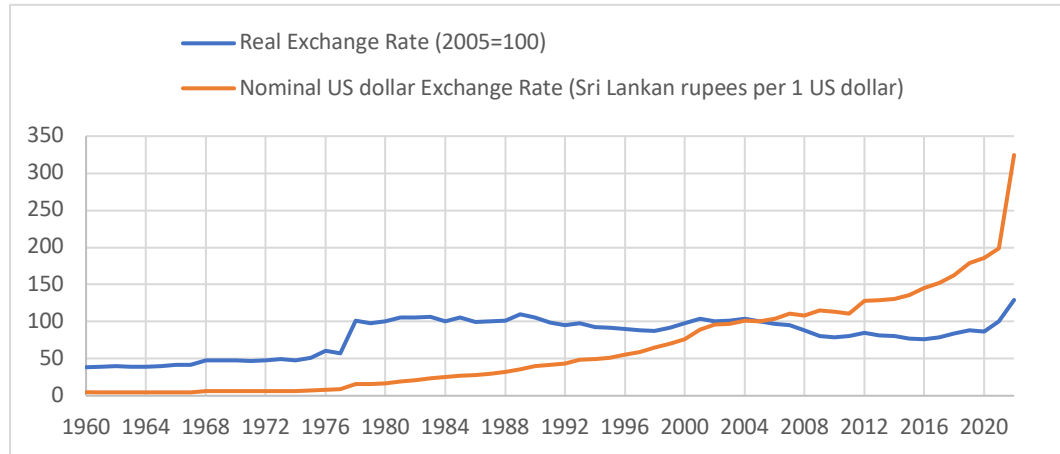


External debts as a share of GDP rapidly increased from 20.9% to 71.4% between 1977-1987. Between 1987-1989, external debts marginally increased to 73.6% from 71.4% of GDP. Large current account deficits, slower economic growth rates after 1983 and lower foreign direct investments after 1982 lay behind this rapid increase in the external debt as a share of GDP. Meanwhile foreign assets as a share of GDP increased from 2.8% to 18.6% between 1975-1979. This increase in foreign assets can be attributed to the positive balance of payment position between the same period. Balance of payment position improved from 0.3% to 8.8% of GDP between 1975-1977. Then it declined to 1.5% of GDP by 1979. Underlying the positive BOP (Balance of Payment) position between 1975-1977 was the improvement in the current account balance which increased from -2.9 to 3.5% of GDP. Although current account balance declined to -6.8% of GDP by 1979, inflows into the financial account more than compensated the negative balance in the current account. Between 1979 and 1989, foreign assets as a share of GDP declined to 8.4% of GDP due to large current account deficits.

The government continued to hold on to inefficient and loss-making public corporations during this period. IMF report noted that in 1990, 10% of the labour force was employed by the central government and another 10% was employed by public corporations. Although treasury bill auctions had been introduced in 1986, central bank continued to involve themselves in buying treasury bills in order not let the treasury bill yield to increase (IMF, 1996). Eruption of civil war in 1983 effectively ended the first wave of the economic reforms, as the government became unpopular, and policy makers were preoccupied with deteriorating security and economy (Dunham & Kelegama, 1997).

Foreign worker remittances came into prominence in 1978. In 1978 net transfers, of which foreign worker remittances constituted a major part was at 2.9% of GDP. This grew into 8.9% of GDP by 1982. Between 1982 and 2022, the average net transfers were at 6.9% of GDP helping reduce the current account balance of Sri Lanka.

Figure 13. Nominal and Real US Dollar Exchange Rate



External debts as a share of GDP rapidly increased from 20.9% to 71.4% between 1977-1987. Between 1987-1989, external debts marginally increased to 73.6% from 71.4%. of GDP. Large current account deficits, slower economic growth rates after 1983 and lower foreign direct investments after 1982 lay behind this rapid increase in the external debt as a share of GDP. Meanwhile foreign assets as a share of GDP increased from 2.8% to 18.6% between 1975-1979. This increase in foreign assets can be attributed to the positive balance of payment position between the same period. Balance of payment position improved from 0.3% to 8.8% of GDP between 1975-1977. Then it declined to 1.5% of GDP by 1979. Underlying the positive BOP (Balance of Payment) position between 1975-1977 was the improvement in the current account balance which increased from -2.9 to 3.5% of GDP. Although current account balance declined to -6.8% of GDP by 1979, inflows into the financial account more than compensated the negative balance in

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1.4 1990-2004 Period

The second wave of economic reforms, which resulted from IMF structural adjustment program between 1988-1991, was implemented between 1990 and 2004. Under this economic reform program, the government started privatizing state-owned enterprises, started promoting foreign direct investment and made an attempt to implement a rationalized tariff structure. For the first time in Sri Lanka, change of government in 1994 did not derail the privatization program. Following table shows the average values of selected economic indicators during 1990-2004 in comparison with the 1978-1989 period.

Table 2. Comparison of Selected Economic Indicators Between 1978-1989 and 1990-2004

Period Averages	1978-1989	1990-2004
Fiscal Deficit (% of GDP)	11.4	8.2
Current Account Deficit (% of GDP)	7.3	4.0
National Savings (% of GDP)	18.4	20.5
National Investments (% of GDP)	25.7	24.6
Economic Growth (%)	4.5	4.7
Inflation Rate (%)	12.6	9.6
Trade Dependence Ratio (% of GDP)	69.5	77.6
Foreign Direct Investments (% of GDP)	0.74	1.2
Monetary Base Nominal Growth Rate (%)	17.8	13.4
Year End 91 Day Bond Yield (%)	12.8	14.26
Real Interest Rate (%)	0.41	3.57

Except for the national investment, all other selected economic indicators show an improvement from the 1978-1989 period. As a result of the privatizations, private sector started playing an increasing role in the economy (Athukorala and Jayasuriya, 2013).

Average exports share of the GDP increased from 28.5% to 34.6% between 1990-2004 period while the average import share of GDP increased from 41% to 43% during the same period. Share of foreign direct investment which was 0.7% in the GDP between 1978-1989 increased to 1.2% during 1990-2004. Sri Lankan rupee appreciated by 2.5% in real terms with relation to US dollar during this period. The downward trend of trade dependence ratio which started in 2000 continued until 2022.

Average external debt as a percentage of GDP increased from 54.6% to 62% during 1990-2004. External debt increased from 72% to 73.4% of GDP between 1990-1993, then gradually decreased to 53.2% by 2001. By 2004 external debt as a percentage of GDP was at 54.9%. This reduction in external debt as a percentage of GDP between 1993-2004 was mainly driven by decrease in average current account deficit, increased average foreign direct investments, higher average economic growth rate and real appreciation of the local currency. Meanwhile average foreign assets as a percentage of GDP increased from 11.3% to 17.1% during 1990-2004. Foreign assets increased from 10.7% to 24.5% of GDP between 1990-1994 and then it declined to 16.6% of GDP. This can be explained by the positive balance of payment position between 1990 -1995. Balance of Payment position at 1990 was 1.5% of GDP which improved to 6.4% of GDP by 1993. By 1994, BOP position was at 2.0% of GDP.

Lower national investment can be explained by the escalating civil war which strained the fiscal resources of the government and diverted them to the national defence. Absence of large-scale public investment projects like in the early 80s, and higher real interest rates also contributed to the decreased national investments as a share of GDP. Increased defence spending also put a hold on the rationalization of tariffs (Athukorala and

Jayasinghe, 2013). In addition, civil war scared away potential foreign investors (Kelegama, 2000). Although lower than the period between 1978-1989, fiscal deficit still remained large at 8.2 percent of GDP. Increasingly the government turned to the central bank to finance its fiscal deficit generating inflationary pressures. Average annual inflation rate of 9.6 caused the currency to undergo real appreciation against US dollar. Lack of transparency in the implementation of the privatization program gradually eroded public support for the privatization of state-owned enterprises (Athukorala and Jayasinghe, 2013).

World bank report noted that public sector continued to play a dominating role in public utilities, energy, financial sector and transport. In addition, public sector employed 14% of the total labour force in 2004 (World Bank, 2004).

1.5 2005-2014 Period

From 2005, the government started reversing trade liberalisation policies by introducing para tariffs and nontariff barriers. The privatization program was reversed by reviving closed down state owned enterprises and renationalizing some previously privatized state-owned corporations (Athukorala and Jayasuriya, 2013). Due to the civil war which lasted between 1983-2009, the government was forced to allocate considerable budgetary resources to the national defence. This situation coupled with the damage and/or destruction of existing infrastructure during the war meant that there was a huge demand for the infrastructure at the end of the civil war. With the end of the civil war in 2009, the government initiated a massive public investment program. As shown in table 4, national investment rate, national savings rate, inflation rate, fiscal deficit and economic growth rate show improvement when compared with the period between 1990-2004. Current account deficit slightly increased during 2005-2014. Unlike the surge in economic growth

following the implementation of economic liberalization program in 1978, this surge in economic growth was powered by the non-tradeable sector mainly led by the construction sector (Athukorala and Wagle, 2022). This was evident from the falling trade dependence ratio. Share of exports and imports of goods and services in the GDP fell from 32.3% and 41.3% in 2005 to 21.1% and 29.2% respectively in 2014. With the drying up of concessionary financing following Sri Lanka's graduation to a lower middle-income country in 1997, the government had to rely on expensive foreign financing to fund the gap between national saving and national investment.

Table 3. Comparison of Selected Economic Indicators between 1990-2004 and 2005-2014

Period Averages	1990-2004	2005-2014
Fiscal Deficit (% of GDP)	8.2	6.7
Current Account Deficit (% of GDP)	4.0	4.3
National Savings (% of GDP)	20.5	26.0
National Investments (% of GDP)	24.6	30.3
Economic Growth (%)	4.7	6.6
Inflation Rate (%)	9.6	9.0
Trade Dependence Ratio (% of GDP)	77.6	56.8
Foreign Direct Investments (% of GDP)	1.17	1.23

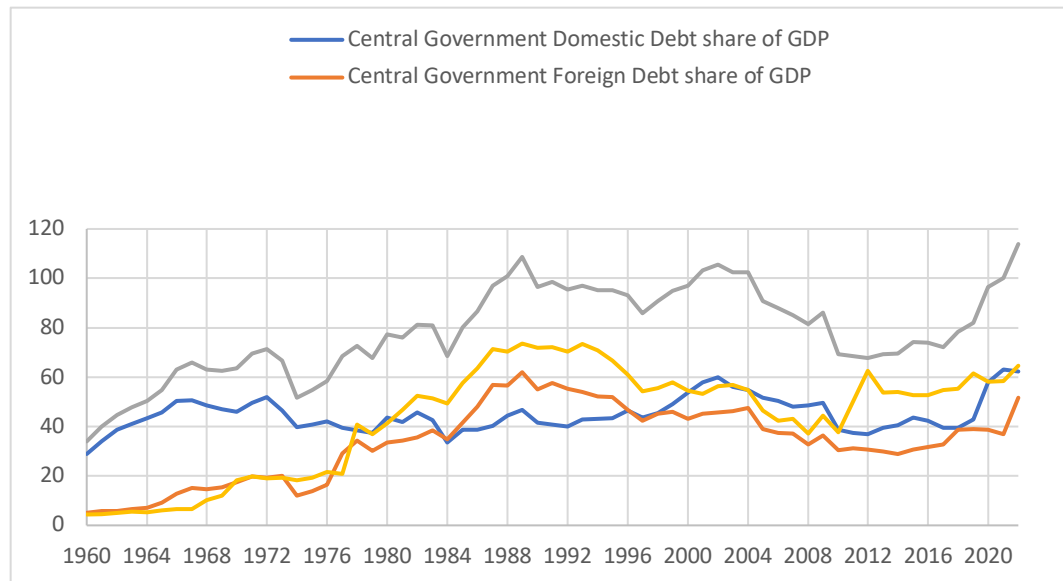
Monetary Base Nominal Growth Rate (%)	13.4	13.4
Year End 91 Day Bond Yield (%)	14.26	10.99
Real Interest Rate (%)	3.57	1.10

Between 2005 and 2014, central government debt to GDP ratio decreased from 90.8% to 69.5%. Three factors mainly contributed to the declining central government debt to GDP ratio. Those were high real growth rate of GDP, real appreciation of Sri Lankan rupee against US dollar and improved primary balance in the fiscal account. Sri Lankan rupee underwent a real appreciation of 19.7% against US dollar Between 2005 and 2014. Immediately following the end of the civil war in 2009, economic growth rate jumped to 8% in 2010. Economic growth rate was to remain above 8% during 2010-2012. The average economic growth rate of 6.6% was the highest average economic growth rate recorded for the time periods considered for this study. The proportion of foreign debt in total central government debt was 43% in 2005. Primary deficit of the fiscal account which averaged 2% of GDP during 1990-2004 improved to 1.7% of GDP during 2005-2014.

The proportion of foreign debt in total central government debt was 43% in 2005. This figure slightly declined to 41.6% in 2014. But profile of the government debt changed drastically ever since government first approached international capital market in 2007 to include more non concessional debts in its foreign debt portfolio by 2014. The proportion of non-concessional debts in the basket of external debts of the central government

decreased from 96.9% in 2005 to 47.7% in 2014. Following chart shows the evolution of the central government debt to GDP ratio between 1960-2022.

Figure 14. Central Government Debt to GDP Ratio



Meanwhile average external debt to GDP declined from 62.0% of GDP during 1990-2004 to 47.2% of GDP. This improvement was driven by the higher economic growth and real appreciation of the currency. On average, current account deficit deteriorated from 4.0% during 1990-2004 to 4.3% during 2005-2014. Foreign assets which averaged at 17.1% of GDP during 1990-2004 declined to 13.4% of GDP during 2005-2014. It should be noted that average balance of payment position marginally deteriorated from 1.1% of GDP during 1990-2004 to 1.06% during 2005-2014. It is clear from these figures that inflows to the financial account did not generate foreign assets. With persistent current account deficits this not only led to balance of payment crises, but to a sovereign debt crisis in 2022.

Inflation rate which was recorded at 11.6% in 2005 increased to 22% in 2009 driven by high food and fuel prices (IMF, 2009). Then it decreased to 3.2% by 2014. Kelegama (2017) argues that the currency was not allowed to depreciate in order to show improved economic indicators like debt to GDP ratio and per capita income. This real appreciation of the local currency had a deleterious impact on the exports of goods and services of the country. Average trade deficit which was 9.7% of GDP between 1990-2004 worsened to 11.1% of GDP during 2005-2014. Fortunately, net transfers, a large proportion of which consisted of foreign worker remittances, improved from an average of 5.9% of GDP during 1990-2004 to 7.2% of GDP during 2005-2014.

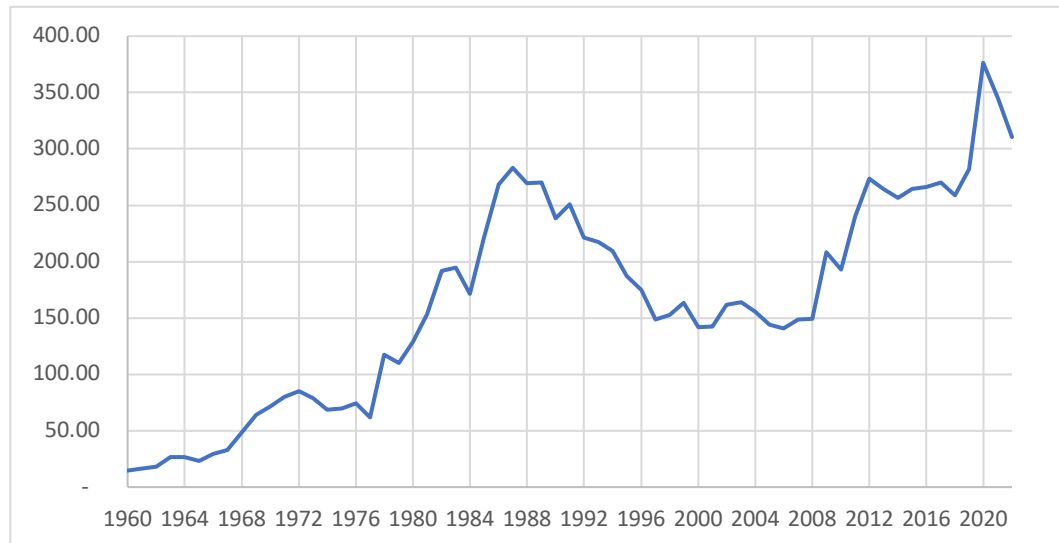
One obvious sign that Sri Lanka could be heading for a foreign debt crisis was the rising external debt and external debt service to exports of goods and services ratio between 2005-2014.

Table 4. Debt and Debt Service Ratios Between 1978-2014

Period	Total Debt of Central Government (% of GDP)	Total External Debts (% of GDP)	Total External Debts (% of Exports of Goods & Services)	Government Debt Service (% of Government Revenue)	External Debt Service (% of Exports of Goods & Services)	Interest Payments on Central Government Debts (% of GDP)
1978-1989	83.2	54.6	198.3	34.5	20.2	4.6
1990-2004	96.9	62.0	182.0	68.9	14.6	6.2
2005-2014	77.6	47.2	201.8	95.1	17.2	4.9

External debt to exports ratio which had fallen from 238.6 to 155.4 during 1990-2004 period started increasing during 2005-2014 period. By 2014 external debt to GDP ratio stood at 256.4. In the meantime, external debt service to exports of goods and service increased from 7.9% to 21.7% during the same period.

Figure 15. External Debt (As a % of Exports of Goods and Services)



Another signal that the government could be heading for trouble in repaying the public debt was the increasing debt service to government revenue ratio. Average central government debt service to revenue ratio which was at 68.9 % of GDP during 2005-2014 increased to 95.1% during 2005-2014 period. Underlying this trend was the change in composition of the public debt in favour of non-concessional debts and the decreasing tax revenue as a share of GDP. Tax revenue declined from 13.7% of GDP in 2005 to 10.1% of GDP by 2014.

Figure 16. Central Government Debt Service (% of Government Revenue)

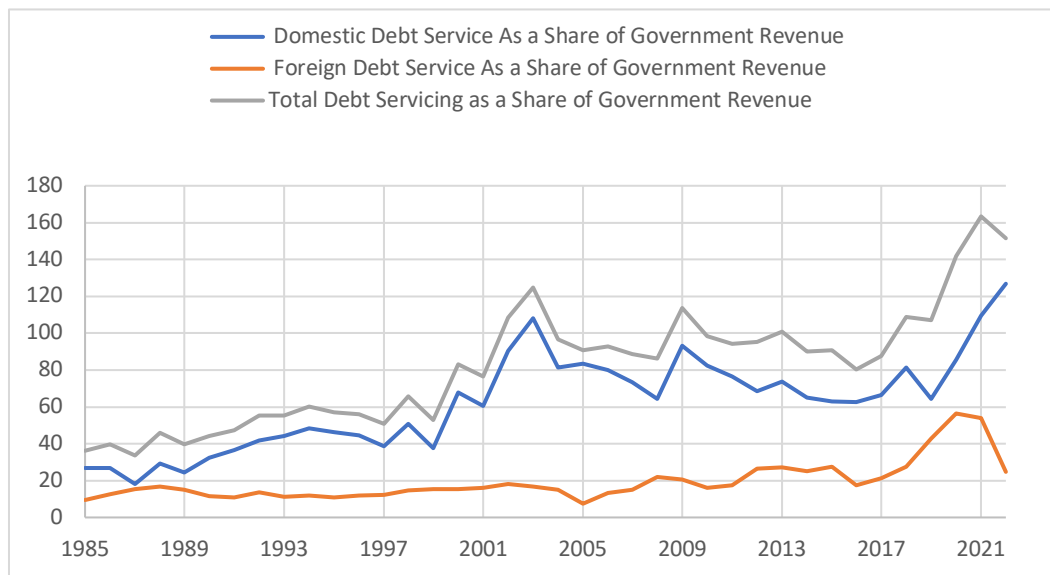
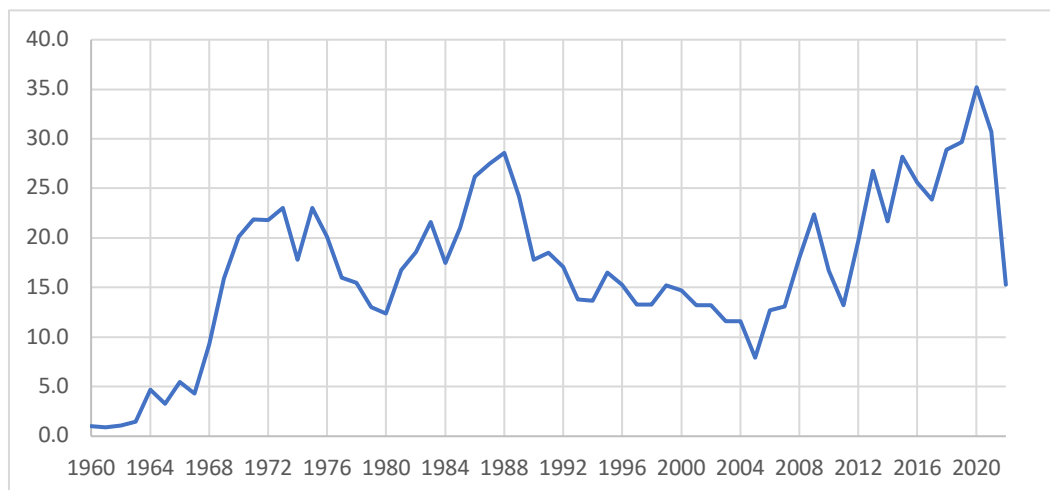


Figure 17. External Debt Service (% of Exports of Goods and Services)



1.6 2015-2022 Period

New administration that came to power in 2015 made an attempt to increase the tax revenue of the government. As a result of this tax policy, the government was able to post positive primary balances consecutively in 2017 and 2018. But the government was not able to initiate growth enhancing structural reforms such as restructuring loss-making public corporations.

Table 5. Comparison of Selected Economic Indicators Between 2015-2022

Period Averages	2015-2022
Fiscal Deficit (% of GDP)	8.0
Current Account Deficit (% of GDP)	2.3
National Savings (% of GDP)	32.8
National Investments (% of GDP)	35.1
Economic Growth (%)	1.1
Inflation Rate (%)	10.5
Trade Dependence Ratio (% of GDP)	45.6
Foreign Direct Investments (% of GDP)	0.95
Monetary Base Nominal Growth Rate (%)	11.9
Year End 91 Day Bond Yield (%)	10.73
Real Interest Rate (%)	0.87

Contrary to the fiscal consolidation policies agreed upon between the IMF and the Sri Lankan government under the extended fund facility in 2016, the new government elected in 2019 introduced massive tax cuts. These tax cuts were implemented purportedly to revive the flailing economy reeling from the Easter Sunday bomb attack in April 2019

(CBSL, 2019). This dealt a major blow to the fiscal consolidation program of the government raising doubts about government capacity to repay its foreign debt. Three major credit rating agencies downgraded the credit rating of Sri Lanka, effectively shutting off Sri Lanka from international capital markets (Advocata, 2021, IMF, 2022). At the same time, the Covid 19 pandemic hit the world. In order to refinance foreign debt and to pay for imports the government turned to short term financing instruments and official reserves.

Gross official reserves plummeted from 2019 to 2022. By the end of the year 2022, usable gross official reserves (official gross reserves excluding the swap facility with the Peoples Bank of China) covered only 0.2 months of imports (IMF, 2023). Between April 2021 and March 2022 exchange rate per US dollar was effectively fixed at 200. This official US dollar exchange rate was not credible and therefore it led to a thriving foreign currency black market. Foreign worker remittances fell during 2021 and 2022 implying the use of unofficial channels by foreign workers to remit funds (Athukorala and Wagle, 2022). Shortage of foreign currency led to shortages in gasoline, cooking gas, food and rationing of electricity supply. Amid falling gross official reserves and lack of foreign currency inflows into the financial account, the government declared a moratorium on its external debt servicing on April 12, 2022. Unrest generated by these shortages forced the president to step down from his office (IMF, 2023). Following table shows unfolding of the sovereign debt crisis through indicators of debt and debt service ratios.

Table 6. Debt and Debt Service Ratios During 2014-2022

Year	Current Account Deficit (% of GDP)	Fiscal Deficit (% of GDP)	Total Debt of Central Government (% of GDP)	Total External Debts (% of Exports of Goods and Services)	Government Debt Service (% of Government Revenue)	External Debt Service (% of Exports of Goods & Services)
2014	2.5	5.5	69.5	256.4	90.0	21.7
2015	2.2	7.2	74.3	264.7	90.6	28.2
2016	2.0	5.0	74.0	266.0	80.2	25.6
2017	2.4	5.1	72.2	270.4	87.5	23.9
2018	3.0	5.0	78.3	258.6	108.8	28.9
2019	2.1	9.0	81.9	282.2	107.0	29.7
2020	1.4	10.6	96.4	376.3	141.9	35.2
2021	3.7	11.7	100.1	345.3	163.4	30.7
2022	1.9	10.2	113.9	310.7	151.5	15.3

Monetary base expanded by 35% during the year reflecting the financing of the fiscal deficit by the central bank. Inflation started increasing from 2021 and peaked at 69.8% by September 2022. In order to control the inflation, CBSL hiked the overnight lending rate by 10 percentage points. Additionally, CBSL curtailed deficit financing which

caused the expansion of the monetary base to slow down. In order to support this restrictive monetary policy, government hiked personal and corporate income tax and value added tax. Government also increased the administrative prices of fuel, cooking gas and electricity to the cost recovery level. Following table shows the evolution of the sovereign debt crisis through selected economic indicators.

Table 7. Performance of Selected Economic Indicators During 2014-2022

Year	GDP Growth Rate (%)	Monetary Base Nominal Growth Rate (%)	Annual Average Inflation Rate (%)	Nominal US Dollar Exchange Rate (per US Dollar, Year End)	91-day Treasury Bill Yield -Year End
2014	6.4	18.3	3.2	131.05	5.74
2015	4.2	16.5	3.8	144.06	6.45
2016	5.1	27.1	4.0	149.80	8.72
2017	6.5	9.8	7.7	152.85	7.69
2018	2.3	2.3	2.1	182.75	10.01
2019	-0.2	-3.0	3.5	181.63	7.51
2020	-4.6	3.4	6.2	186.41	4.69
2021	3.5	35.4	7.0	200.43	8.16
2022	-7.8	3.3	49.7	363.11	32.64

Inflation started to fall from its peak ended at 57.2% by the end of 2022. With more revenue flowing into government coffers, shortages of cooking gas, fuel and electricity rationing started to ease off. Once the official cap on exchange rate was removed, US dollar exchange of Sri Lankan rupee rate fell to 364. To stop further depreciation of the currency, central bank effectively pegged the rupee at 360 rupees (IMF, 2023). With reduced monetary financing of fiscal deficit, import and capital controls and high interest rates, spread between official and curb market exchange rate gradually decreased. By the end of the year US dollar exchange rate remained at 364 Rs.

1.7 For Time Periods, Summary and Conclusion

In 1950, just two years after independence, Sri Lanka had gross foreign assets which were nine times the gross external debts. These foreign assets were the result of accumulated surpluses in the current account. Instead of using these foreign assets as a launching pad for economic development, the Sri Lankan government initiated economic policies that scared away foreign investments, disincentivized exports, and stalled economic growth. This gave rise to twin deficits.

An ill-targeted food subsidy program, which was very popular among the electorate, consumed significant budgetary resources and caused current account deficits through imported food items. This created the first link between fiscal deficits and current account deficits. Import controls coupled with import substitution policies, initiated to reduce the dependence on imports and save the dwindling foreign assets, did not help in getting imported inputs to local businesses to generate output. Ironically these policies increased the dependence on imports and stalled the economic growth. The threat of nationalization combined with import controls did not encourage foreign investments.

State owned enterprises established in order to support the import substitution policies worsened the fiscal deficits by requiring constant budgetary resources remain operational.

Later governments attempted to reverse these policies through better targeting of welfare programs, privatization of state-owned enterprises, promotion of exports and foreign investment. Inconsistency in policies regarding international trade, foreign investment and state-owned enterprises is obvious when policies of different administrations between 1978-2022 are analysed. Remarkably the central bank maintained a consistent exchange rate policy of a 'nearly' fixed exchange rate regime during this period even after adopting flexible exchange rates in 1978 and 2001, contributing to the real appreciation of the currency, thereby adversely affecting the current account balance. The central bank was also consistent in financing the fiscal profligacies of different administrations through direct purchase of debts issued by the treasury or keeping the interest rates low through intervention in the treasury auctions, contributing to the high inflation during the study period. Instead of trying to entice foreign investors through creation of a stable macroeconomic environment favourable to establishing export-oriented industries, the government granted tax concessions, exemptions and holidays to attract foreign investments. This led to low tax to GDP ratios worsening the fiscal deficit.

Between 1983 and 2009, the government was often distracted from pursuing economic reforms by the intensifying civil war which diverted budgetary resources to the national defence and scared away potential foreign investors. The golden opportunity to become a fast-growing economy was missed due to adoption of trade protectionism and interventionist economic policies. An unspectacular rise in foreign investment following the end of the civil war forced the government to turn to international capital markets to

fund the current account and fiscal deficits. Although the economy grew at record high rates for a short period immediately after the war, the government did not initiate productivity enhancing economic reforms to sustain the high economic growth rates (Kelegama, 2017, p.434). Economic growth supported by the growth in the non-tradeable sector made it vulnerable to the slowdown in the economy, currency depreciation and increasing current account deficits. Analysis of exchange rate policies between 2005-2014 shows that that central bank expended a lot of energy to keep the exchange rate fixed in order to keep up the charade of impressive economic performance amid deteriorating current account deficits.

In the months leading to the sovereign debt crisis, amid monetary financing of large fiscal deficits, the central bank lost credibility when they attempted to maintain a fixed exchange rate against the US dollar by using depleted foreign reserves. By the end of 2022 following the suspension of foreign debt servicing, foreign debts stood at approximately 8.4 times the foreign assets, a far cry from the situation just after independence.

2.0 LITERATURE REVIEW

2.1 Review of Theoretical Background

Weerakoon et al (2017) views the national accounting identity as the first step in exploring the relationship between fiscal balance and current account balance.

$$\text{GNP} = C + I + G + (X - M) + R \dots\dots\dots (1)$$

GNP = Gross National Product

C = Private Consumption

I = Gross Capital Formation/National Investments

G = Government Consumption

X = Exports of Goods and Services

M = Imports of Goods and Services

R = Net Factor Income from Abroad and Net Transfers

GNP is the national income of the country.

$$\text{CA} = X - M + R \dots\dots\dots (2)$$

CA = Current Account Balance

$$S = \text{GNP} - C - G \dots\dots\dots (3)$$

S = National Savings

$$S = S_p + S_g \dots\dots\dots (4)$$

S_p = Private Savings

S_g = Government Savings

$$Sp = GNP - T - C \dots\dots\dots (5)$$

$$Sg = T - G$$

T = Government Receipts

$$S = GNP - T - C + T - G = I + (X - M) + R = I + CA \dots\dots (6)$$

“The Sixth Edition of the Balance of Payment and International Investment Position Manual” published by the IMF (2010, p.222) says that the above identity denoted by equation (6) defines the relationships between economic variables such as the current account balance, investments and national savings rather than describe the behaviour of the economic agents. Krueger and Coterelli (1998) have shown that the current levels of net foreign assets is a reflection of the past accumulated current account balances showing the intertemporal behaviour of the variables in the above identity.

$$Sp + (T - G) = I + CA \dots\dots\dots (7)$$

$$CA = (Sp - I) + (T - G) \dots\dots\dots (8)$$

Current Account Balance = Excess Private Savings Over Investments + Fiscal Balance

Perera and Liyanage (2012) present two extreme scenarios. In the first scenario private savings over investments remain constant over time, then current account balance is fully dependent on the fiscal balance. This is the twin deficit hypothesis. The other scenario is the cancellation of the increase in private savings over investments by the opposite movement in the fiscal balance, so that current account balance remains the same. This scenario is called the Ricardian Equivalence Hypothesis.

There are two approaches that are used to explore the relationship between the twin deficit hypothesis: the Ricardian Equivalence Hypothesis, and the Keynesian proposition

based on the Mundel Fleming model (Perera and Liyanage, 2012). The Keynesian proposition suggests that the government fiscal balance determines the current account balance if excess savings over investments remains constant.

According to the Ricardian Equivalence Hypothesis (REP), a tax cut or an increase in government expenditure will decrease government savings, but the private sector (anticipating a future increase in government taxes) will increase their savings. Therefore, national savings and the current account balance won't be impacted. In other words, REP states that there is no relationship between the fiscal balance and the current account balance (Abbas et al, 2011).

Salvatore (2006) explained the direct link between the budget deficit and the current account deficit using the Mundel-Fleming model, which is a special case of IS-LM-BP model. IS stands for investment-savings and represents the equilibrium in the goods market. LM stands for liquidity money and represent the equilibrium in the asset market. BP stands for balance of payment and represent the equilibrium in the balance of payment position. Mundel-Fleming model assumes infinite mobility of financial capital internationally and interest rates in the local economy is equal to world interest rates. Since Sri Lanka has relatively more capital controls in place to prevent the free flow of funds between financial accounts than G7 countries, use of Mundel-Fleming model is not suitable in the case of Sri Lanka. Therefore, the general IS-LM-BP model will be used in this study.

2.2 Review of Empirical Work

Twin deficit studies reviewed below can be grouped into two categories. In the first category, the empirical studies cover more than one country. In the second category, the

empirical investigations focus on a single country. Studies belonging to the first category will be reviewed first in order to identify common channels among various countries through which fiscal policies are transmitted to the current account balances. This will be followed by review of studies in the second group in order to identify characteristics specific to that country that help explain the presence or absence of twin deficit hypothesis in that country.

Corsetti, Muller and Sibert (2006) stands out among all studies reviewed for this research. Because this study goes beyond the national accounting identity in building the theoretical framework for the twin deficit hypothesis. Authors argue that twin deficit is more likely if the economy is more open and if the fiscal expansions are persistent. The theoretical framework and empirical analysis of this paper is based on the trade balance rather than on current account balance. According to the authors, the use of trade balance is underpinned by theories which are used to explain the twin deficit hypothesis. In order to derive the trade balance, net interest payments on foreign debt have been removed from the current account balance. Same deduction has been conducted on the fiscal balance in order to derive the primary balance, which is used as proxy for fiscal policy tool. They argue that two traditional channels; relative price movements and intertemporal investment and savings decisions, through which fiscal shocks are transmitted to the current account balance do not tell the whole story. According to them, interaction between the above-mentioned channels constitute a third transmission channel of fiscal policy are to impact the current account balance. Domestic fiscal expansion in an economy that is less integrated with the global economy, have a reduced impact on domestic investments through terms of trade movement and increased real interest rate differentials. In the same

way, for a given degree of fiscal shock persistence, heightened interest rate differentials tend to crowd out domestic investments in an economy that is not much open to trade. The end result is that for a relatively closed economy, twin deficits cannot be observed. The authors selected two relatively closed economies, USA and Australia; and two relatively open economies, Canada and the UK for the empirical study. Annual data between 1980-2005 was used in the empirical study. The functional form estimated is Vector Auto Regression (VAR). The empirical evidence suggests that persistence of fiscal shocks and openness of the economy impact the magnitude of the twin deficits. Authors also show that terms of trade and interest rate differentials do not respond to the fiscal shocks as envisaged by the authors. Had the authors included developing small economies with varying degrees of openness, the robustness of the empirical results could have been checked.

Unlike the previous study, the study conducted by Abbas et al (2011) covered a maximum of 88 countries which included low income/emerging economies and advanced economies. Empirical analysis was conducted using panel regressions, and panel vector autoregressions. Instead of the fiscal balance to GDP ratio, the authors used the cyclically adjusted primary balance to potential GDP ratio. They argue that endogeneity could arise since automatic stabilizers associated with business cycles making changes to the fiscal balance and current account balance. In order to keep the changes to the fiscal balance exogenous, the impact of automatic stabilizers is removed by using cyclically adjusted primary balance (CAPB). The authors also argue that the endogeneity problem could be worsened due to the denominator of actual GDP. Therefore, they used potential GDP for the denominator. For the same reason oil exporting economies has been excluded from the empirical investigation. Panel regression covered the period between 1970-2007 and

involves 88 countries, among which 58 countries are low income/emerging economies. Other than the key variables of current account to GDP ratio and cyclically adjusted primary balance (CAPB) to GDP ratio, dummy variables for economic development, trade openness, financial openness, exchange rate regime, state of potential output and external debt/GDP ratios have been included in the panel regression. Panel regression suggests that the relationship between current account and fiscal balance become stronger for developing countries, higher than median trade openness, higher than median financial openness, floating exchange rate regimes, and for actual output higher than potential output. Relationship become weaker when the external debt to GDP ratio was higher than the median. Panel regression suggests that for one percentage point increase in CAPB to GDP ratio, current account to GDP ratio increased by 0.2 – 0.3 percentage points. Authors, having studied episodes of large fiscal adjustments for both advanced and developing economies, conclude that median current account changes scaled by cyclically adjusted primary balance changes are in the range of 0.05 and 0.2, which are lower than those observed in the panel regression. These current account changes are smaller for advanced economies than for developing countries. Exceptions are observed when the economy is over heated (which is indicated by the real effective exchange rate appreciation or actual output above potential output) in the run up to the fiscal consolidation. In those situations, median ratio of current account adjustment to CAPB adjustment were recorded in the range of 0.16 and 0.3. This ratio also increases when the fiscal consolidation is led by revenue enhancement.

In the VAR method, authors, using quarterly data, observed the response of current account to GDP ratio, and output gap /log of real GDP to the increase of one standard

deviation of the log of real government consumption. The authors assume that the shock to a government fiscal policy can be approximated by the change in government spending on consumption. When the shocks were rescaled to an implied change of 1 percentage point in the government consumption to GDP ratio, the change in the current account to GDP ratio upon impact was slightly higher for emerging/low-income economies. They also observe a stronger response in the current account of countries more open to trade, to a shock in the government consumption. The difference between responses of the current account to GDP ratio having either fixed or flexible exchange rate regimes were found to be statistically insignificant. As a robustness check on the results, the authors replicated the analysis using annual data and including the full sample of countries used in the panel regression. The response of the current account to GDP ratio upon impact was again found to be stronger for emerging/low-income countries than advanced economies. The inclusion of the real exchange rate in the VAR analysis did not significantly change the response of the current account to a shock in the government consumption.

The study carried out by Bluedorn and Leigh (2011) finds evidence for a strong relationship between the fiscal balance and current account balance during episodes of fiscal consolidation which is in conflict with the findings of Abbas et al (2011). The key finding of this paper is that use of CAPB approach downplays the link between the twin deficits. The authors argue that the cyclically adjusted primary balance is not completely devoid of non-policy factors. In addition, discretionary policy changes could be made to fiscal policy as a response to economic developments other than fiscal consolidation which could directly or indirectly impact the current account balance. All these scenarios could lead to endogeneity. Therefore, Bluedorn and Leigh (2011) used contemporaneous policy

documents to identify discretionary changes made to the fiscal policy with the sole purpose of reducing the budget deficit, not as a response related to economic growth, current account balance, domestic demand or any other economic development. Empirical study was conducted on 17 countries belonging to Organization of Economic Cooperation and Development (OECD) spanning the period between 1978-2009. With the selected form OLS was used to calculate parameter estimates. According to the author's baseline specification, the action-based approach shows that 1 percent of fiscal consolidation reduces the current account deficit to GDP ratio by 0.6 percent which is much more than shown by the CAPB approach. Authors show that fiscal consolidation is transmitted to the reduction current account deficit through depreciation of real exchange rate and contraction in investment. Examining the experience of the countries that adopted the euro after 1999, authors show that improvement in the current account balance has occurred through a process of internal devaluation where contractions in investment, domestic demand and compression of domestic prices played a prominent part. Authors suggest that fiscal consolidation could help improve the current account balance in the Eurozone. Authors caution that implementation of fiscal consolidation policies among trading partners could mitigate the impact on current account balance. Finally, authors show that CAPB based approach fails to show the strong link between the twin deficits, because CAPB includes the effects of a surge in investments and real exchange rate appreciation. The authors could have included variables for investment and real exchange rate in the baseline and modified baseline specifications to reduce endogeneity.

Beetsma, Giuliodori and Klaasen (2008) investigated the consequences public spending shocks on the trade balance in the European Union countries. The sample included 14 EU countries and annual data covered the period between 1970-2004. The econometric model included variables for public spending, cyclically adjusted net taxes, exports, imports and real effective exchange rate. All variables were real log values. VAR was used to build the model. The trade balance reduced by 0.5% of GDP upon impact when public spending increase of 1% of GDP. The trade deficit peaked at 0.8% of GDP. The budget balance deteriorated by 0.7% upon impact of public spending increase. These findings agree with the twin deficit hypothesis. Authors split the sample into 'open' and 'closed' economies and investigate the impact of public spending on trade and budget balances. They concluded that a spending shock has a larger impact on output in 'closed' economies whereas trade balances in the 'open' economies receive the largest impact. Unlike the previous papers discussed above, this paper uses more variables in the econometric model. But the paper does not discuss the transmission channel from the fiscal balance to the trade balance.

Salvatore (2006) investigated the twin deficit hypothesis for G7 countries. Theoretical framework based on Mundel Fleming Model was used by Salvatore to explain the budget deficit and the current account deficit. The variables used for the study included contemporaneous current account deficit, contemporaneous and lagged budget deficit, contemporaneous GDP growth of the country and the rest of the world. No variable for money supply was included in the model even though Mendel Fleming model clearly shows the importance of changes in the money supply when having a flexible exchange rate regime. The author did not use the cointegration method to investigate the presence of

a long run relationship between the selected variables; nor did he use the Granger causality test to find the direction of causality between the budget deficit and the current account deficit. Salvatore concludes that lagged budget deficits significantly influence the current account deficits for all G7 countries.

All the above research papers reviewed for this study had been conducted on developed countries. The following two papers cover geographical areas incorporating developing countries. Ravinthirakumaran, S.Slvanathan & E.Selvanathan (2015) conducted an empirical investigation into the twin deficit hypothesis covering the 5 SAARC (South Asian Association for Regional Cooperation) countries of which Sri Lanka is a member country. All member countries in the SAARC region are developing countries. Ravinthirakumaran, S.Slvanathan & E.Selvanathan (2015) used annual data between 1980 and 2012. Only the two key variables were used, and both were measured as ratios of GDP. Stationarity was established for both variables in the first difference for all 5 countries using ADF test. The authors established the cointegrating relationship between the two variables using the Johansen method for all countries except India. The Granger causality test was conducted to determine the direction of causality. For Sri Lanka and Pakistan, it ran from the fiscal balance to the current account balance. For India, Nepal, and Bangladesh the direction of causality ran the other way.

Alleyne, Lugay and Dookie (2011) conducted an empirical study covering 11 CARICOM (Caribbean Community) countries to find the relationship between the budget deficit and the current account deficit using annual data for the period 1980-2010. Besides the twin balances, the model included the productivity of imports (defined by the ratio of GDP to intermediate inputs), real GDP, and the real interest rates. Variance decomposition

was estimated within the vector autoregressive moving average (VARMA) framework by investigating the composition of the variance induced by a shock from the fiscal balance on the current account and vice versa. The Granger causality test was used to find the direction of causality between current account deficit and the budget deficit. Three groups were identified based on the direction of causality. For one group of countries, there was no significant statistical relationship between the budget deficit and the current account deficit. For the second group of countries direction of causality was either from budget deficit to current account deficit or vice versa. For the third group of countries causation was bidirectional. The authors did not use the cointegration method to investigate the presence of a long run relationship.

The following papers focus on a single country in their research into the twin deficit hypothesis.

A.Javid, M.Javid and Arif use annual data to study the twin deficit hypothesis in Pakistan between 1960 and 2009. They used structural VAR method to build the econometric model. In the empirical analysis five variables, real GDP, government budget deficit to GDP ratio, current account to GDP ratio, real interest rate and exchange rate were included in the model. In order to remove exogeneity, automatic stabilizer effects through business cycles have been removed from fiscal policy shocks. The authors show that expansionary fiscal policies improve the current account balance while depreciating the exchange rate. Authors find that output shocks rather than fiscal shocks drive the changes in the current account balance. Authors attribute this divergence between the twin deficits to the crowding out of investment caused by fiscal expansions and increase in real interest

rates. These findings contradict the findings of Ravinthirakumaran, S.Selvanathan and E.Selvanathan (2015) in relation to Pakistan.

An empirical study to investigate the relationship between the twin deficits in China was conducted by Banday and Aneja (2019) using annual data from 1985-2016. Unlike most models used in the studies carried out on Sri Lanka, the model used in this study included several variables. The other variables were the broad money supply, the real effective exchange rate, and the real interest rate measured by the deposit interest rate minus the inflation rate. ADF and PP tests were conducted to find the presence of unit roots in each data series. Then in order to account for the structural breaks when looking for unit roots in the data, Zivot and Andrews (ZA) unit root test was conducted. ARDL bound test confirmed the presence of a long run relationship between the variables. Except for the money supply, all other coefficient estimates in the long run relationship were significant. Excluding both money supply and real effective exchange rate, all other variables were significant in their difference or lagged difference form in the short run relationship. Granger causality test showed unidirectional causality from the budget deficit to the current account deficit.

Several studies that had been conducted to investigate the relationship between current account balance and fiscal balance in Sri Lanka are reviewed in this section. Except for the studies conducted by Chowdhury and Saleh (2007), and Liyanage and Perera (2012), all other studies covering Sri Lanka have only included two variables – the current account balance and the fiscal balance in their model. Among the studies related to Sri Lanka, only Sivarajasingham and Balamurali (2012) found that direction of causation was bidirectional between the current account deficit and the fiscal deficit. All other studies

related to Sri Lanka shows that direction of causality ran from the budget deficit to the current account deficit. Only Weerakoon et al did not succeed in establishing a long run relationship between the budget deficit and the current account deficit among studies covering Sri Lanka.

Saleh, Nair and Agalewatte (2005) used an autoregressive distributed lag model (ARDL) and the bounds test for cointegration to investigate the long run relationship between the current account balance and budget balance. Annual data between 1970 and 2003 were used in their empirical study and both key variables were defined as ratios to GDP. The bounds test confirmed the presence of a long run relationship between the twin deficits. Empirical results from Granger causality test showed that direction of causality ran from the budget deficit to the current account deficit.

A study conducted by Chowdhury and Saleh (2007) built on the earlier work by Saleh, Nair and Agalewatte (2005). Unlike the previous model, the ARDL model used for this study included a variable for the investment-savings gap, a proxy variable for trade openness and a dummy variable to take into account the structural break for the current account in 1978. In order to account for the structural breaks of the variables on their stationarity, the innovational outlier 1 model and additive outlier methods were used. Trade openness was estimated by taking the ratio of imports plus exports to GDP. Using data between 1970 and 2005 and the bounds test for cointegration, a long run relationship between the current account balance, the savings investment gap and the fiscal balance was established. Unlike the previous study no Granger causality test was conducted to determine the direction of causality between current account balance and the fiscal balance in the presence of other variables.

Sivarajasingham and Balamurali (2012) examined the twin deficit hypothesis using annual data between 1960-2010. Data was transformed into log form. The study was conducted using the Engel Granger cointegration method and the associated error correction model to establish the long run relationship between the current account deficit and the fiscal deficit. The Granger causality test was applied to determine the direction of causality between the two deficits. Based on the empirical results from the study, they concluded there was bi-directional causality ran from the budget deficit to the trade deficit as well as the opposite direction.

Premaratne, Navaratnam, and Mayandy (2011) conducted a study to investigate the dual deficit hypothesis in Sri Lanka for the period 1977-2010. Only the two key variables - deflated by 1996 prices - were used in the empirical analysis. The empirical analysis was conducted using Engel Granger cointegration test and Granger causality test. Their analysis confirmed the existence of a long-term relationship. According to their Granger causality testing, causality ran from the fiscal deficit to the current account deficit. They analysed the effect of one standard deviation shock of one variable on the future values of the same variable and the other variable using impulse response functions. Then they used variance decomposition analysis to determine the amount of forecast error variance that can be explained by exogenous shocks for each of the two variables.

Liyanage and Perera (2012) included four variables in their empirical model: the budget deficit, the current account deficit, nominal interest rates and exchange rates. They used annual data between 1960 to 2009 and quarterly data from 1990:1 to 2009:4. Exchange rate was represented by the nominal exchange rate of one US dollar in terms of Sri Lankan rupee. Even though the exchange rate regime was made flexible in 1978,

Central Bank of Sri Lanka has continued to intervene directly and/or indirectly in determining the nominal exchange rate. In any event, it is the real exchange rate rather than the nominal exchange rate that influences the current account balance. The authors did not use real interest rates despite the fact that their own theoretical framework shows the link between the budget deficit and the current account goes through real interest rates. The Engel Granger cointegration test and Johansen cointegration test confirm the existence of long-run relationship between the fiscal balance and the current account balance. But they found that neither the interest rate nor the exchange rate had a significant impact in explaining the twin deficits in Sri Lanka. Causality testing found that unidirectional causality ran from the fiscal balance to the current account balance. They did not find any causality running from the budget deficit to interest rates, from interest rates to exchange rates, and from exchange rates to current account deficits when annual data was used. But when quarterly data was used Granger causality testing confirmed unidirectional causality running from exchange rates to the current account balance.

Weerakoon, Kumar and Dime (2019) give a detailed description of the background of the twin deficit problem that has afflicted Sri Lanka throughout its post independent history. For their empirical study, the authors used the fiscal balance and current account balance as a percentage of GDP and annual data from 1970-2017. Augmented Dicky Fuller test, Philips Perron test, and the Zivot and Andrews breakpoint test were conducted to check for stationarity in the current account and fiscal balance data series. All three tests confirmed the stationarity for the current account balance data, whereas the last two tests confirmed the stationarity for the fiscal balance data. Therefore, no long run relationship was established. Causality testing shows that unidirectional causality ran from the fiscal

balance to the current account balance. Using impulse response functions Weerakoon et al found that a shock on the fiscal balance had a positive effect on the current account balance, whereas a shock on the current account balance had no impact on the fiscal balance.

Jayasundara and Fernando (2022) conducted an empirical study to establish the short run and long-run relationship between the twin deficits using the ARDL model and the associated error correction method. They used annual data from 1977 to 2020. Their Granger causality testing showed unidirectional causality ran from the budget deficit to the current account deficit. The stability of the long run relationship between the twin deficits was confirmed by the CUSUM test and CUSUM of squares tests.

Twin deficit studies that have been carried out on Sri Lanka have not used variables for real interest rates, real effective exchange rates and money supply in their empirical model. Based on the literature review, the empirical model can include these variables in addition to the two main variables. Use of these variables is also justified based on the theory of general IS-LM-BP model which underpins the twin deficit hypothesis. In addition, the literature review showed that trade dependence can amplify the influence of fiscal policies on the current account balance. Therefore, the inclusion of trade dependence in the empirical model can be justified in order to study the link between twin deficits. The annual data covering the period from 1960 to 2022 will be used.

In order to investigate the cointegration relationship between current account balance, fiscal balance and other selected variables, it is very important that any non-stationarity that could be present in the data series be detected. Use of non-stationary data series could lead to spurious relationships between current account balance, fiscal balance and other selected variables. Augmented Dickey Fuller (ADF) test and Phillips Peron (PP)

test are commonly used stationarity tests. Unlike ADF test, PP test takes account of the autocorrelation and heteroskedasticity of the error terms. Non-stationary data series can be made stationary by taking the first difference. If the original data series is found to be stationary, then order of integration for that data series is $I(0)$. If the first difference of the data series is stationary, then order of integration for that data series is $I(1)$. Shrestha and Bhatta (2018, p.75) points out taking first difference can lead to loss of information. Cointegration method that will be applied in the empirical study depends on the order of integration of the data series for selected variables. Granger causality test can be conducted to investigate the direction of causality between current account balance, fiscal balance and other selected variables.

3.0 METHODOLOGY

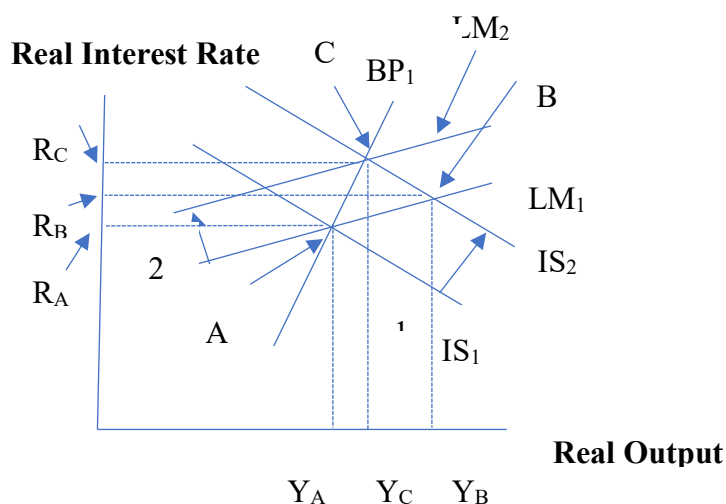
Between 1960-1977, government of Sri Lanka officially pursued a policy of fixed exchange rate regime. As mentioned in the introduction, except for a brief period during 1977-1982 and 2001, the de facto exchange rate regime has been closer to a fixed exchange rate regime. Two scenarios can be considered.

In the first scenario slope of the BP line is assumed to be greater than the slope of the LM line.

$$\text{Slope of BP } \frac{di}{dY} = \frac{-T_Y}{K_i} > \text{Slope of LM } \frac{di}{dY} = \frac{-L_Y}{L_i}$$

Figure 1 shows the how the increased government spending with government revenue unchanged impact the output and real interest rates under fixed exchange rate.

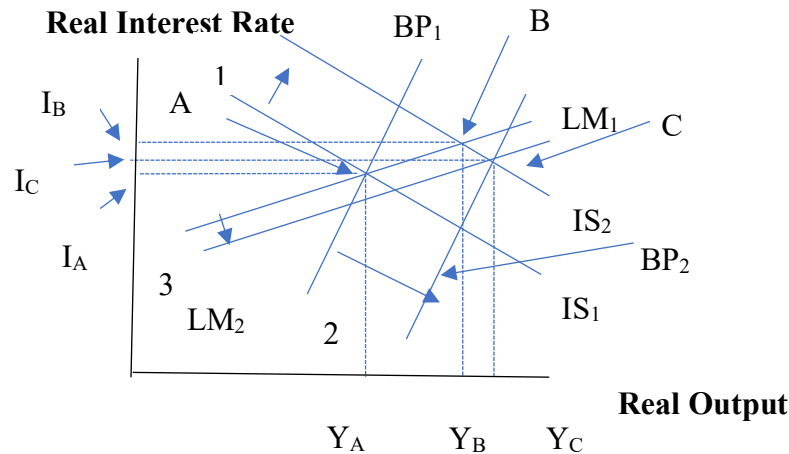
Figure 18. Transmission of Fiscal Policy with Increased Fiscal Deficit



When fiscal deficit of the government increases, it will put upward pressure on the interest rates encouraging foreign capital flow into the country. This will appreciate the

exchange rate of the Sri Lankan rupee leading to a deficit in the current account. Since inflows into the financial account is not adequate to cover the current account deficit, this will generate a balance of payment deficit. CBSL will start selling foreign currencies from their reserves flowing into the country in order to maintain the fixed exchange rate by contracting the local money supply. The contracted money supply will put upward pressure on the interest rates, incentivizing financial flows into the financial account. This will lead to an equilibrium in the balance of payments. In the short run, output will increase from Y_A to Y_B . In the long run, output will only increase to Y_C , which is lower than the Y_B . Meanwhile, the real interest rate will increase from R_A to R_B in the short run. In the long run, the real interest rate will increase to R_C which is greater than R_B .

Figure 19. Transmission of Exchange Rate Devaluation



When the CBSL devalues the exchange rate under a fixed exchange rate regime, it will have a positive impact on net exports and the current account balance. This will lead to an expansion in the output. Expansion in the output will generate upward pressure on the interest rates. Increased interest rates will encourage capital flows into the financial

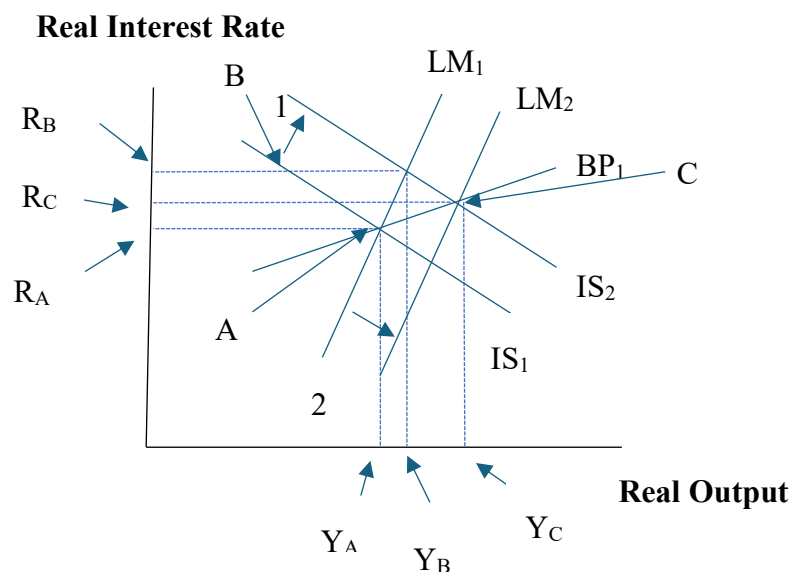
account leading to a surplus in the balance of payment. This will put appreciation pressure on the exchange rate of the local currency forcing the central bank to buy the foreign currency flowing into the country by expanding the money supply. Expansion of the local money supply will put downward pressure on the interest rates leading to a diminished capital inflow. Reduced interest rates will help increase the output. Increased output will tend to reduce the net exports and reduce the surplus in the balance of payment account. This will help establish equilibrium in the balance of payment. In the short run, output will increase from Y_A to Y_B . In the long run, output will increase to Y_C from Y_A , where Y_C is greater than Y_B . In the short run, interest will increase to I_B from I_A . In the long run, interest rate will settle at I_C , which is lower than I_B .

If the devaluation is not so much, increased interest rates due to expansion of output will not generate enough financial inflows to cover the trade deficit caused by output expansion. Therefore, there will be a balance of payment deficit. CBSL has to intervene by selling down their foreign reserves in order to prevent the further devaluation of the currency. In this case, short run output will increase to Y_B from Y_A . But the long run output level will be at Y_C , which is less than the short run output level. In the short run, interest rate will increase from I_A to I_B . In the long run, interest will increase to I_C , which is greater than the short run interest rate of I_B .

In the second scenario slope of the BP line is assumed to be less than the slope of the LM line.

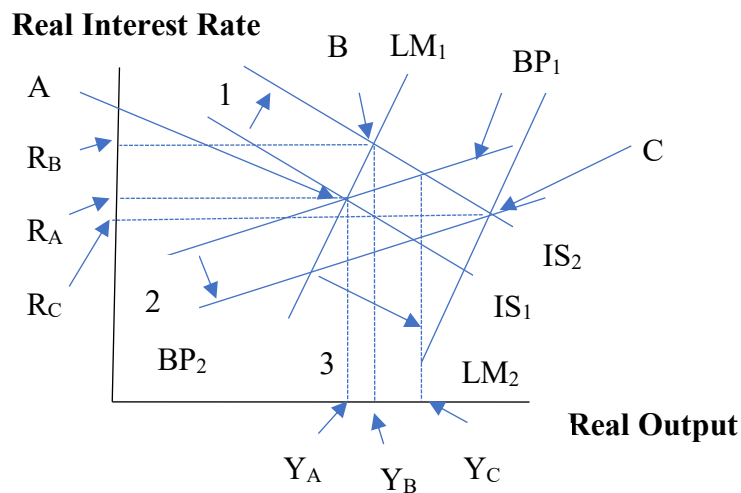
$$\text{Slope of BP } \frac{di}{dY} = \frac{-T_Y}{K_i} < \text{Slope of LM } \frac{di}{dY} = \frac{-L_Y}{L_i}$$

Figure 20. Transmission of Fiscal Policy with Increased Fiscal Deficit



In Figure 19, an increased budget deficit will put upward pressure on the interest rates encouraging foreign capital flow into the country. This will appreciate the exchange rate of the Sri Lankan rupee leading to a deficit in the current account. But initially, inflows into the financial account will generate a surplus in the balance of payments. For the CBSL to maintain a fixed exchange rate, they will start buying foreign currencies flowing into the country by expanding the domestic money supply. The expanded money supply will put downward pressure on the interest rates, reducing the appreciation pressure on the local currency. Financial flows into the financial account will gradually diminish, leading to an equilibrium in the balance of payments. In the short run output will increase to Y_B from Y_A and real interest rate will increase to R_B from R_A . In the long run, output will increase to Y_C from Y_B and real interest rate will decrease to R_C from R_B .

Figure 21. Transmission of Exchange Rate Devaluation

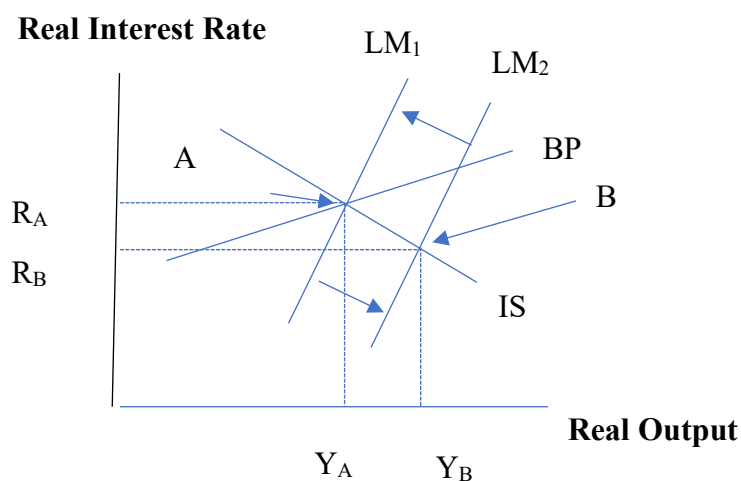


In Figure 20, when the CBSL devalues the exchange rate under a fixed exchange rate regime, it will have a positive impact on net exports and the current account balance. This will lead to an expansion in the output. Expansion in the output will generate upward pressure on the interest rates. Increased interest rates will encourage capital flows into the financial account leading to a surplus in the balance of payment. This will put appreciation pressure on the exchange rate of the Sri Lankan rupee forcing the CBSL to buy the foreign currency flowing into the country by expanding the money supply. Expansion of the local money supply will put downward pressure on the interest rates leading to a diminished financial inflow. Reduced interest rates will help increase the output. Increased output will tend to reduce the net exports and reduce the surplus/increase the deficit in the current account. This will help establish equilibrium in the balance of payment. In the short run, output will increase from Y_A to Y_B , while the real interest rate will increase from R_A to R_B .

In the long run, output will increase from Y_B to Y_C , while the real interest rate will decrease from R_B to R_C .

If the devaluation is not so much, like in first scenario long run output Y_C will be lower than the short run output of Y_B . Long run interest rate of Y_C will be greater than the short run interest rate Y_B .

Figure 22. Transmission of Monetary Policy with Increased Money Supply



With a fixed exchange rate, as depicted in Figure 21, when the CBSL either buys foreign financial assets or local government bonds, the domestic money supply increases. This causes the domestic interest rates to come down. Reduced domestic interest rates will increase the output in the short run, which can increase the demand for imports. Inflows into the financial account will also reduce. This situation will lead to a balance of payment deficit. Since there is an excess supply of domestic currency, CBSL can buy local currency by running down its foreign reserves. This will shift the money supply back its original state. Output and interest rate will revert back its original state. This shows that monetary

expansion does not have an impact on output and interest rate in the long run. This will not change when the slope of the BP line is greater than the slope of the LM line.

It is clear from these scenarios that changes in the exchange rate, interest rate, and output play a significant role in explaining the relationship between the fiscal balance and the current account balance. Each scenario depends on the responsiveness of the current account, the financial account, interest rates and output in the local economy to the fiscal and monetary policy changes. Since change money supply will neither have an impact on output nor interest rates, variable for money supply will not be considered in this study. The inclusion of output growth, the real interest rate, and real effective exchange rate is based on proposed relationships discussed above. Rather than excluding the effects of automatic stabilizers from fiscal policy by taking the cyclically adjusted primary balance, this study has included variables for real output growth, real exchange rate, and real interest rate in order to account for the endogeneity.

4.0 DATA AND EMPIRICAL RESULTS

Annual data from 1960-2022 is examined in the empirical analysis. Data for fiscal balance, inflation rate, nominal interest rate, current account balance, GDP growth rates, exports and imports were obtained from World Bank database and Central Bank of Sri Lanka annual publications. Real effective exchange rates were obtained from Bruegel, an economic think tank based in Brussels, Belgium. Following table summarizes these variables.

Table 8. Summary of Data

Variable	Description	Mean	Std.Dev	Min	Max
FBGDP	Fiscal balance (government revenue-government expenditure) to GDP ratio	-7.9	2.7	-19.2	-3.3
CAGDP	Current account balance (X-M + R) to GDP ratio	-3.9	3.2	-16.4	3.5
REALINT	End of year annual yield for 91-day bond, adjusted for inflation	1.38	4.36	-11.4	10.9
REER	Real effective exchange rate, 2007=100, real appreciation of LKR* increases value of REER	151.70	95.08	79.04	357.95
TRADEPGDP	Trade dependence ratio given by imports + exports to GDP ratio	61.7	13.5	37.0	88.6
GDPGR	Annual real GDP growth rate based on 2015 constant prices	4.4	2.9	-7.8	8.7

*LKR=Sri Lankan rupee

Figure 23. Cross-correlogram for Current Account Balance and Fiscal Balance

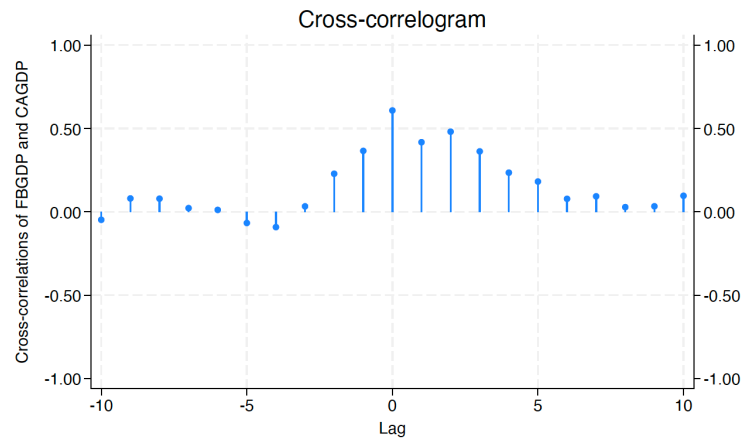


Table 9. Lag and Lead Correlations

Lags	Fiscal Balance, Current Account Balance	Leads	Fiscal Balance, Current Account Balance
0	0.6079	0	0.6079
1	0.4175	1	0.3654
2	0.4807	2	0.2284
3	0.3625	3	0.0328
4	0.2349	4	-0.0918
5	0.1815	5	-0.0671
6	0.0778	6	0.0113
7	0.0928	7	0.0220
8	0.0280	8	0.0787

9	0.0331	9	0.0802
10	0.0961	10	-0.0480

The highest correlation takes place when there is no lag or lead. For lags 1 to 5 and leads 1 and 2 each correlation is above 0.1. All other correlations are relatively close to zero.

Augmented Dicky Fuller (ADF) Test and Philips – Perron (PP) tests were conducted to check for the stationarity of each data series. In both ADF Test and PP Test, null hypothesis is that the selected variable is not stationary. If the t statistic in the test is less than the critical values at 1%, 5% or 10% significance, the null hypothesis can be rejected. The table below gives t statistic for each variable in the ADF test and PP test. Number of ‘*’ signs in the superscript of the test statistic indicates if the t statistic for each variable is less than critical value at the significance level corresponding to the number of ‘*’. Since t statistics for fiscal balance to GDP ratio, current account balance to GDP ratio, real interest rate, GDP growth rate were less the critical values at either 1%, 5% or 10% significance level, null hypotheses were rejected. Since t statistics for real effective exchange rate and trade dependence ratio were greater than critical values at 1%, 5% and 10% significance level, there was little evidence to reject the null hypothesis. The stationarity of the first difference of real effective exchange rate and trade dependence ratio were checked using the same procedure as above. T statistics for the first difference of those variables were less than the critical values at either 1%, 5% or 10% significance level,

null hypothesis could be rejected. Therefore, first difference of real effective exchange rate and trade dependence ratio is stationary.

Table 10. Summary of Stationarity Test Statistics for Each Variable

Variable	ADF	PP
FBGDP	-2.811*	-4.062***
CAGDP	-3.775***	-4.543***
REALINT	-4.073***	-5.126***
REER	-2.604*	-2.174
REER - First Difference	-2.804*	-5.845***
TRADEPGDP	-1.551	-1.472
TRADEPGDP – First Difference	-6.878***	-6.857***
GDPGR	-2.039	-4.413***

*less than critical value at 10% significance level, ** less than critical value at 5% significance level, *** less than critical value at 5% significance level.

Based on the results of stationarity tests, it was decided to apply the autoregressive distributed lag model (ARDL) bound test in order to investigate the long run relationship between the variables. Unlike other cointegration methods, variables can have a mix of I (0) or I (1) in the ARDL model. Variables can also have different lag lengths. In addition, only a single regression equation is set up. Table 11 reports each coefficient estimate along

with the standard error, t-statistic and p-value under the hypothesis that coefficient is equal to zero.

$$\begin{aligned}
 CAGDP_t = & \beta_0 + \beta_1 CAGDP_{t-1} + \beta_2 FBGDP_{t-1} + \beta_3 REALINT_t + \beta_4 REER_t \\
 & + \beta_5 REER_{t-1} + \beta_6 TRADEPGDP_t + \beta_7 TRADEPGDP_{t-1} + \beta_8 GDPGR_t \\
 & + \beta_9 GDPGR_{t-1} + \epsilon_t
 \end{aligned}$$

Table 11. ARDL Model (1, 0, 0, 1, 1, 1)

CAGDP	Coefficient estimate	Standard Error	t	P> t
CAGDP L1	-0.1861336	0.0989098	1.88	0.066
FBGDP	0.8249069	0.1238487	6.66	0.000
REALINT	0.03582	0.0605846	0.59	0.557
REER	-0.0606338	0.0219126	-2.77	0.008
REER L1	0.0578739	0.0211418	2.74	0.009
TRADEPGDP	-0.1074969	0.0544612	-1.97	0.054
TRADEPGDP L1	0.1346277	0.0553593	2.43	0.019
GDPGR	-0.375431	0.0971939	-3.86	0.000
GDPGR L1	-0.2880804	0.1184262	-2.43	0.019
Constant	4.700339	1.804933	2.60	0.012

Error correction form of the above ARDL model is given below.

$$\begin{aligned}\Delta CAGDP_t = & \alpha_0 + \alpha_1 CAGDP_{t-1} + \alpha_2 FBGDP_t + \alpha_3 REALINT_t + \alpha_4 REER_t \\ & + \alpha_5 TRADEPGDP_t + \alpha_6 GDPGR_t + \alpha_7 \Delta REER_t + \alpha_8 \Delta TRADEPGDP_t \\ & + \alpha_9 \Delta GDPGR_t + u_t\end{aligned}$$

Replacing the current account balance to GDP ratio dependent variable with a change in this variable and including slightly different explanatory variables is a potential error correction functional form. The associated parameter estimates are in Table 12.

Table 12. Error Correction Form of ARDL Model

	$\Delta CAGDP$	Coefficient estimate	Standard Error	t	P> t
ADJ	CAGDP L1	-0.8097515	0.0984399	-8.23	0.000
LR	FBGDP	1.009671	0.1645175	6.14	0.000
	REALINT	0.0470464	0.0742509	0.63	0.529
	REER	-0.0023173	0.0041094	-0.56	0.575
	TRADEPGDP	0.0356409	0.0296524	1.20	0.235
	GDPGR	-0.8142572	0.1672997	-4.87	0.000
SR	$\Delta REER$	-0.562009	0.0209673	-2.68	0.010
	$\Delta TRADEPGDP$	-0.1407467	0.0742509	0.63	0.529

	Δ GDPGR	0.2854319	0.1179762	2.42	0.019
	Constant	4.431035	1.767488	2.51	0.015

Bound test was conducted to investigate the presence of a long run relationship between fiscal balance to GDP ratio, current account balance to GDP ratio and other variables. Null hypothesis of the bound test is that there is no long run relationship between the current account to GDP ratio and other variables. If the F statistic is greater than upper bound levels at given significance levels of 10%, 5%, 2.5% and 1%, then null hypothesis is rejected. Likewise, if the t statistic for the adjustment coefficient estimate is less than the critical values at 10%, 5%, 2.5% and 1% significance, then null hypothesis is rejected. Critical values of F statistic and t statistic along with the significance level is given below.

Table 13. ARDL Bound Test

Significance Level	0.1		0.05		0.025		0.01	
	Lower Bound	Upper Bound	Lower Bound	Upper Bound	Lower Bound	Upper Bound	Lower Bound	Upper Bound
Critical Values for F Statistic	2.12	3.23	2.45	3.61	2.75	3.99	3.15	4.43
Critical Values for t Statistic	-2.57	-4.04	-2.86	-4.38	-3.13	-4.66	-3.43	-4.99

F statistic = 15.073

t statistic = -8.226

Since F statistic is greater than the upper bound critical values at all significance levels and t statistic is lower than the lower bound critical values at all significance levels, null hypothesis can be rejected. Statistical significance suggests a long run relationship between fiscal balance to GDP ratio and current account balance to GDP ratio. The real effective exchange rate, GDP growth rate and trade dependence ratio coefficient estimates are each statistically significant in the ARDL model.

The error correction form of ARDL model indicates that any deviation from the long run equilibrium will be corrected with a speed of adjustment of 81% per year. The long run fiscal balance to GDP ratio and GDP growth rate coefficient estimates are statistically significant at 1%. GDP growth rate has a negative impact on the current account balance in the long run, whereas the long run impact of the fiscal balance on the current account is positive. Short run coefficient estimates for change in real effective exchange rate and change in GDP growth rate are statistically significant at 1% and 5% respectively. Except change in GDP growth rate, all other short run variables have a negative impact on the current account balance in the short run.

Durbin alternative test and Breusch-Godfrey (LM) test are used to check for the autocorrelation of the error term in the error correction form of the ARDL model. Null hypothesis of each test state that there is no autocorrelation in the error term. These tests are still valid when functional form includes lagged dependent variables. Breusch-Pagan test is carried out to test for heteroskedasticity of the error term in the error correction form. The null hypothesis of the Breusch-Pagan test states that error term in the error correction

form has no heteroskedasticity. Under the ARDL functional form, there is little statistical evidence of error term serial correlation or error term heteroskedasticity.

Table 14. Diagnostic Tests for the ARDL Model

Diagnostic Test	Test Statistic	P> test statistic 	Conclusion
Durbin Alternative Test for serial autocorrelation of the error term	χ^2 statistic = 1.627	0.2021	Little evidence to reject the null hypothesis
Breusch – Godfrey Test for serial autocorrelation of error term	χ^2 statistic = 1.917	0.1662	Little evidence to reject the null hypothesis
Breusch – Pagan Test for heteroskedasticity for error term	χ^2 statistic = 2.20	0.1376	Little evidence to reject the null hypothesis

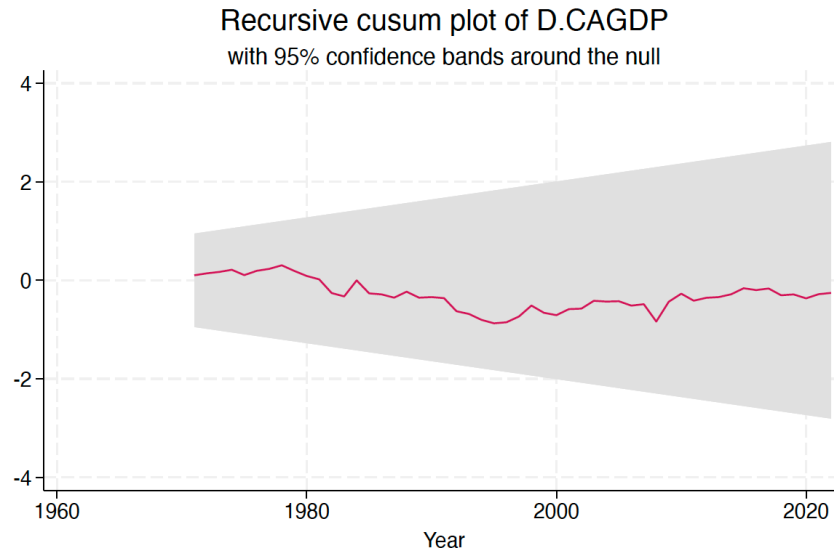
Cumulative sum test is performed to check the stability of the coefficient estimates of the ARDL model over time. First, cumulative sum test is carried out using recursive residuals. Then cumulative sum test is carried out using ordinary least squares (OLS) residuals. Null hypotheses of both tests state that coefficient estimates of the ARDL functional form are stable over time. From both tests, there is little statistical evidence to reject the null hypotheses in both tests.

Table 15. Cumulative Sum Test for Stability of Coefficients of the ARDL Model

Cumulative Sum Test Statistic	Critical Value for 1% Significance	Critical Value for 5% Significance	Critical Value for 10% Significance
0.4451(recursive residuals)	1.1430	0.9479	0.8499

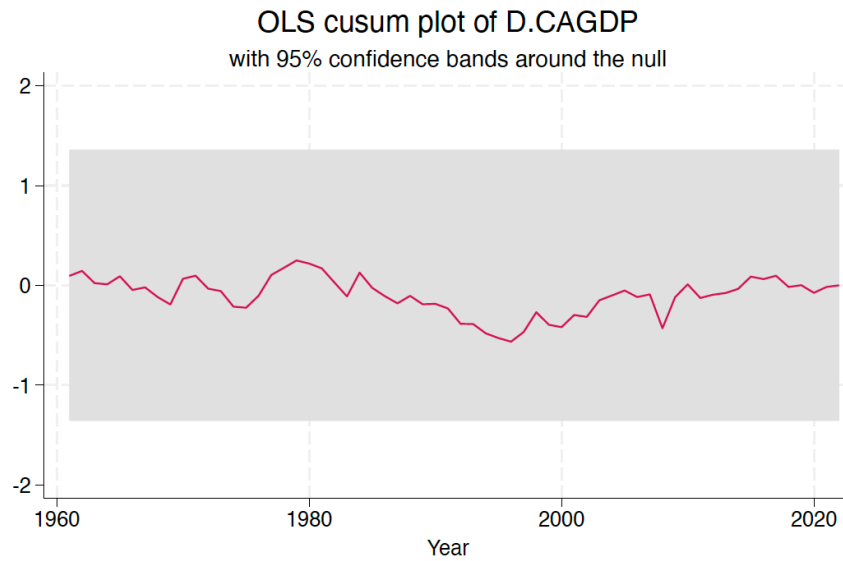
0.5652(OLS residuals)	1.6276	1.3581	1.2238
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Figure 24. Plot of Cumulative Sum of Recursive Residuals



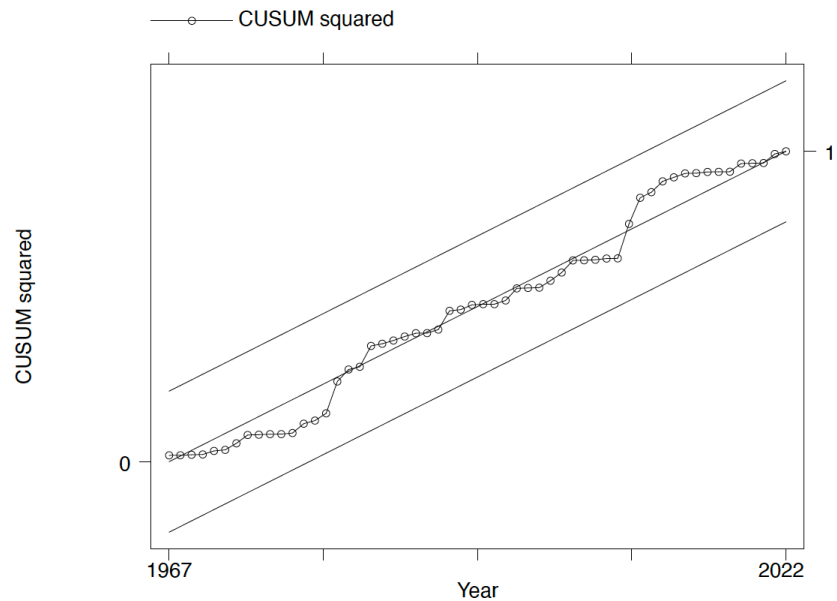
The above plot shows the cumulative sum of recursive residuals. The null hypothesis of the cumulative sum test states that recursive residuals have a normal distribution with 0 mean and a constant variance. Same null hypothesis is used in the cumulative sum test using OLS residuals. The plot shows that cumulative sum of recursive residuals does not cross the 95% confidence bands. This plot shows there is little evidence to reject the null hypothesis.

Figure 25. Plot of Cumulative Sum of OLS Residuals



The above plot shows the cumulative sum of OLS residuals. Plot confirms that there is little statistical evidence to reject the null hypothesis.

Figure 26. Plot of Cumulative Sum of Squares of Recursive Residuals



Above plot also shows that cumulative sum of squares of recursive residuals are within 95% confidence bands at all significance levels. Therefore, there is little evidence to reject the null hypothesis that coefficient estimates in the ARDL error correction functional form are stable over time.

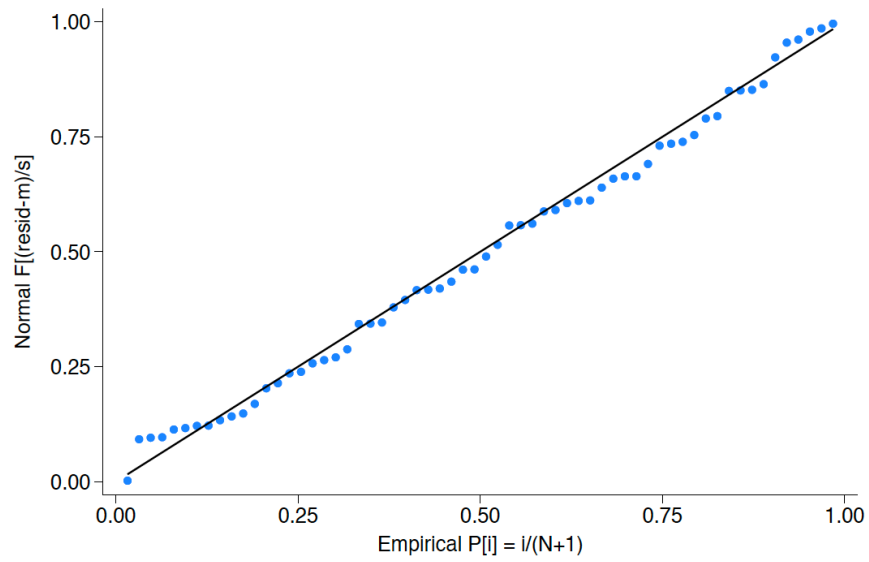
Skewness and kurtosis tests are carried out to check the normal distribution of the residuals. Null hypothesis of the test state that residuals are normally distributed. Based on the chi squared statistic for the joint test of skewness and kurtosis, there is little evidence to reject the null hypothesis.

Table 16. Skewness and Kurtosis Test for Normality

Variable	Observations	Pr (Skewness)	Pr (Kurtosis)	Joint Test Statistic	Prob>χ^2
Residuals	62	0.4580	0.2269	χ^2 statistic = 2.10	0.3505

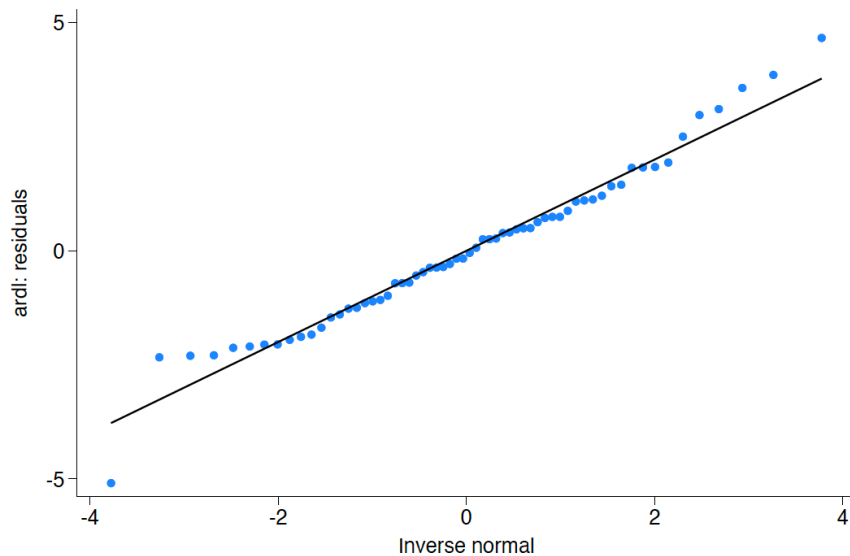
The following plot can be used as a visual aid in identifying deviations of residuals from the normal distribution.

Figure 27. Standardized Normal Probability Plot of Residuals



The following plot can also be used as a visual aid in identifying deviations of residuals from the normal distribution in their tails of distribution.

Figure 28. Normal Quintile Plot of Residuals



Granger causality tests was conducted to find the direction of causality between the fiscal balance and the current account balance. Two vector autoregressive (VAR) models used for fiscal balance and the current account balance are below.

$$\begin{aligned}
CAGDP_t = & \alpha_{1,0} + \sum_{i=1}^3 \alpha_{1,i} CAGDP_{t-i} + \sum_{i=1}^3 \beta_{1,i} FBGDP_{t-i} \\
& + \sum_{i=1}^3 \gamma_{1,i} REALINT_{t-i} + \sum_{i=1}^3 \delta_{1,i} REER_{t-i} + \sum_{i=1}^3 \zeta_{1,i} TRADEPGDP_{t-i} \\
& + \sum_{i=1}^3 \eta_{1,i} GDPGR_{t-i} + u_t
\end{aligned}$$

$$\begin{aligned}
FBGDP_t = & \alpha_{2,0} + \sum_{i=1}^3 \alpha_{2,i} CAGDP_{t-i} + \sum_{i=1}^3 \beta_{2,i} FBGDP_{t-i} \\
& + \sum_{i=1}^3 \gamma_{2,i} REALINT_{t-i} + \sum_{i=1}^3 \delta_{2,i} REER_{t-i} + \sum_{i=1}^3 \zeta_{2,i} TRADEPGDP_{t-i} \\
& + \sum_{i=1}^2 \eta_{2,i} GDPGR_{t-i} + \epsilon_t
\end{aligned}$$

Table 17. Coefficient Estimates of VAR Model with Current Account Balance to GDP Ratio as the Dependent Variable.

CAGDP	Coefficient Estimate	Standard Error	z	P> z
CAGDP L1	0.0140404	0.1621582	0.09	0.931
CAGDP L2	-0.3788445	0.1592247	-2.38	0.017
CAGDP L3	-0.1122871	0.1545281	-0.73	0.467
FBGDP L1	0.2409208	0.1926823	1.25	0.211
FBGDP L2	0.8542968	0.2020777	4.23	0.000
FBGDP L3	0.4238221	0.2291649	1.85	0.064
REALINT L1	-0.1192243	0.0817207	-1.46	0.145
REALINT L2	0.0381688	0.0794586	0.48	0.631
REALINT L3	-0.1201536	0.0774741	-1.55	0.121
REER L1	0.0072084	0.0264799	0.27	0.785
REER L2	0.0098424	0.038502	0.26	0.798
REER L3	-0.0181338	0.0261777	-0.69	0.488
TRADEPGDP L1	0.0234572	0.0697373	0.34	0.737
TRADEPGDP L2	-0.103803	0.1080984	-0.96	0.337

TRADEPGDP L3	0.1466293	0.081658	1.80	0.073
GDPGR L1	-0.3676454	0.173592	-2.12	0.034
GDPGR L2	-0.4715321	0.1685791	-2.80	0.005
GDPGR L3	-0.0659443	0.182304	-0.36	0.718
Constant	6.558759	2.855267	2.30	0.022

Table 18. Coefficient Estimates of VAR Model with Fiscal Balance to GDP Ratio as the Dependent Variable

FBGDP	Coefficient Estimate	Standard Error	z	P> z
CAGDP L1	0.0218926	0.1185427	0.18	0.853
CAGDP L2	-0.062929	0.1163992	-0.54	0.589
CAGDP L3	-0.1937155	0.1129658	-1.71	0.086
FBGDP L1	0.2185007	0.1408579	1.55	0.121
FBGDP L2	0.3330583	0.1477263	2.25	0.024
FBGDP L3	0.2391159	0.1675281	1.43	0.153
REALINT L1	-0.07906	0.597409	-1.32	0.186
REALINT L2	0.0893762	0.0580872	1.54	0.124

REALINT L3	-0.971643	0.0566364	-1.72	0.086
REER L1	0.0087587	0.0193578	0.45	0.651
REER L2	0.0743693	0.0281464	2.64	0.008
REER L3	-0.0776127	0.0191369	-4.06	0.000
TRADEPGDP L1	-0.101733	0.0509806	-2.0	0.046
TRADEPGDP L2	0.092342	0.079024	1.17	0.243
TRADEPGDP L3	-0.0020984	0.0596951	-0.04	0.972
GDPGR L1	0.297454	0.1269022	2.34	0.019
GDPGR L2	0.0069118	0.1232376	0.06	0.955
GDPGR L3	-0.3452317	0.133271	-2.59	0.010
Constant	-2.115007	2.087307	-1.01	0.311

Comparison of functional form of ARDL model with VAR model shows that coefficient estimate of the lagged GDP economic growth rate in both functional forms are statistically significant. Magnitude of the economic growth coefficient estimate implies economic significance. In both functional forms, lagged economic growth rate has a negative impact on the current account balance to GDP ratio. Other lagged coefficient estimates of current account balance to GDP ratio, real effective exchange rate and trade

dependence ratio in the VAR functional form are statistically not significant when compared with the similar coefficient estimates in the ARDL model. In addition, lagged coefficient estimate for current account balance to GDP ratio in the ARDL model is substantively significant compared with the VAR model. There are no comparable lagged coefficient estimates for variables of fiscal balance to GDP ratio and real interest rate in the ARDL model.

Stability of the VAR model is investigated using roots of the characteristic polynomial of the coefficient matrix. Roots of the characteristic polynomial is given eigenvalue matrix. Since modulus of each eigenvalue is less than 1, VAR model is stable over time.

Table 19. Eigenvalue Stability Condition

Eigenvalue		Modulus
0.9602171	0.1668005i	0.974597
0.9602171	-0.1668005i	0.974597
0.9373672		0.9373672
0.7617818	0.1713971i	0.780826
0.7617818	-0.1713971i	0.780826
-0.6801298	0.3577929i	0.7685
-0.6801298	-0.3577929i	0.7685

0.5895764	0.4796321i	0.760031
0.5895764	-0.4796321i	0.760031
-0.7503112	-0.6865733i	0.687845
0.2575104	0.6906244i	0.737071
0.2575104	-0.6906244i	0.737071
0.04180597	0.6865733i	0.687845
0.04180597	-0.6865733i	0.687845
-0.3146099	0.4938663i	0.585562
-0.3146099	-0.4938663i	0.585562
-0.5633535		0.563353
-0.270253		0.270253

Figure 29. VAR Stability Condition

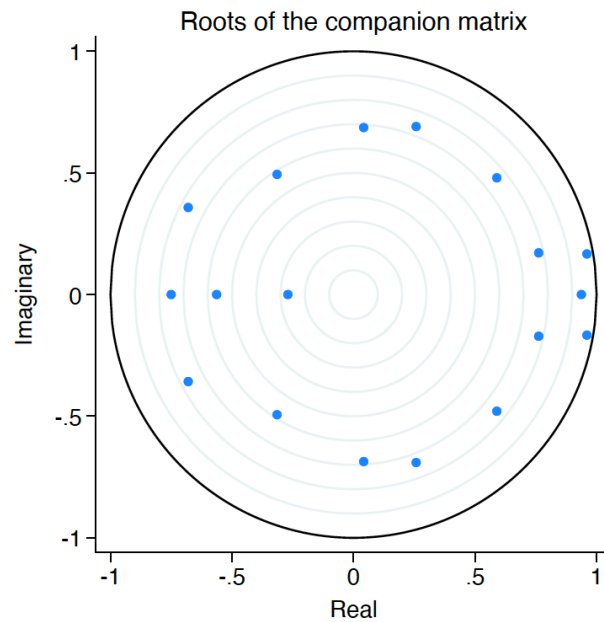


Table 20. Jarque – Bera Test for Normality of the Disturbance Term

Equation	Test Statistic (χ^2)	Prob > (χ^2)
CAGDP	0.675	0.71362
FBGDP	1.187	0.55250

Null hypothesis states that disturbance terms are normally distributed. For each of the two equations above, a Jarque-Bera test provides little evidence to reject the null hypothesis that the error term is normally distributed.

Table 21. Lagrange – Multiplier Test for Autocorrelation of the Disturbance Term

Lag	Test Statistic (χ^2)	Prob > (χ^2)
1	45.8927	0.12627
2	35.9398	0.29932

Null hypothesis states that disturbance terms in the VAR model have no autocorrelations.

A Lagrange Multiplier test provides little evidence to reject the null hypothesis of no autocorrelation.

With the current account balance to GDP ratio as the dependent variable each row of Table 21 involves excluding an explanatory variable in order to test the hypothesis that this does not change the expected value of the dependent variable. This is called a Granger causality test. Another way to conduct Granger causality test is to have null hypothesis that coefficients of excluded variables are jointly zero. Failure to reject the null hypothesis implies that excluded variable Granger causes the dependent variable.

Table 22. Granger Causality Test for Current Account Balance

Equation	Excluded	Test Statistic (χ^2)	Prob > (χ^2)	Statistical Finding
CAGDP	FBGDP	23.054	0.000	FBGDP Granger causes CAGDP
CAGDP	REALINT	4.0741	0.254	REALINT does not Granger cause CAGDP

CAGDP	REER	0.77193	0.856	REER does not Granger cause CAGDP
CAGDP	TRADEPGDP	5.0353	0.169	TRADEPGDP does not Granger cause CAGDP
CAGDP	GDPGR	14.992	0.002	GDPGR Granger causes CAGDP

Based on the chi squared test statistic, null hypothesis that fiscal balance to GDP ratio and GDP growth rate individually do not Granger cause current account balance to GDP ratio can be rejected.

Table 23. Granger Causality Test for Fiscal Balance

Equation	Excluded	Test Statistic (χ^2)	Prob>Chi2	Statistical Finding
FBGDP	CAGDP	3.5564	0.314	FBGDP does not Granger cause FBGDP
FBGDP	REALINT	5.269	0.153	REALINT does not Granger cause FBGDP
FBGDP	REER	18.36	0.000	REER Granger causes FBGDP
FBGDP	TRADEPGDP	4.2419	0.236	TRADEPGDP does not Granger cause FBGDP

FBGDP	GDPGR	14.992	0.002	GDPGR Granger causes FBGDP
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With fiscal balance to GDP ratio as a dependent variable, six Granger causality tests that are each associated with excluding one explanatory variable are in Table 22. Two of these tests provide evidence to reject the null hypothesis that the real effective exchange rate and GDP growth rate do not Granger cause the fiscal balance to GDP ratio. Statistical findings from table 21 are similar to the ARDL long run findings.

Granger causality tests conducted on the VAR model show that 91-day bonds yield adjusted for inflation (REALINT) and trade dependence ratio (TRADEPGDP) individually Granger cause neither current account balance to GDP ratio nor fiscal balance to GDP ratio. Then Granger causality tests are conducted excluding both variables of REALINT and TRDEPGDP from the functional form of VAR model with current balance to GDP ratio as the dependent variable. Granger Causality test shows little evidence to reject the null hypothesis that REALINT and TRADEPGDP together does not Granger causes current account balance. In the same way, Granger causality test was carried out excluding those two variables from the functional form of VAR model with fiscal balance to GDP ratio as the dependent variable. Chi squared statistic is large enough to reject the null hypothesis at 10% significance that real interest rate and trade dependence ratio together do not Granger cause fiscal balance to GDP ratio.

Based on these results, it can be concluded that there is some linear relationship between real interest rate and trade dependence ratio which impact the fiscal balance to GDP ratio.

Table 24. Granger Causality Test for Fiscal Balance and Current Account Balance to GDP Ratio

Equation	Excluded	Test Statistic (χ^2)	Prob>χ^2	Conclusion
CAGDP	REALINT, TRADEPGDP	7.68	0.2621	REALINT, TRADEPGDP jointly do not Granger cause CAGDP
FBGDP	REALINT, TRADEPGDP	10.69	0.0985	REALINT, TRADEPGDP jointly Granger cause FBGDP

5.0 CONCLUSION

These empirical findings suggest a long run relationship between the fiscal balance and the current account balance. This finding agrees with findings of Saleh, Nair and Agalewatte (2005), Chowdhury and Saleh (2007), Sivarajasingham and Balamurali (2012), Premaratne, Navaratnam, and Mayandy (2011), Liyanage and Perera (2012) and Jayasundara and Fernando (2022). This study also finds evidence in Sri Lanka, that a change in fiscal balance influences the current account balance which agrees with the findings of Saleh, Nair and Agalewatte (2005), Chowdhury and Saleh (2007), Premaratne, Navaratnam, and Mayandy (2011), Liyanage and Perera (2012), Weerakoon, Kumar and Dime (2019) and Jayasundara and Fernando (2022). Unlike other studies, Sivarajasingham and Balamurali (2012) found evidence of a bidirectional relationship between fiscal balance and current account balance. It can be concluded from this study the Keynesian proposition that there is a relationship between the twin deficits holds true in the case of Sri Lanka. Under an ARDL model with error correction, the fiscal balance and the GDP growth rate have a statistically significant influence on the current account balance in the long run. While the fiscal balance, real interest rate and trade dependence ratio have had a positive influence on the current account balance in the long run, the long run influence of the GDP growth rate and the real effective exchange rate on the current account have been negative. Under an ARDL model with error correction, fiscal balance has the largest predicted impact on the current account balance in the long run followed by the GDP growth rate. These findings are statistically significant, and the magnitudes imply economic importance. These findings suggest that balance of payments crises Sri Lanka has faced throughout its post independent history has originated from the government fiscal

deficit and import intensive economic growth rate. The real effective exchange rate, real interest rate and trade dependence ratio have had a statistically insignificant impact on the current account balance in the long run.

Statistical findings from Granger causality test suggest that real interest rate and trade dependence ratio jointly Granger cause fiscal balance to GDP ratio, but do not Granger cause current account balance to GDP ratio. Increase in the real interest rate can have a negative impact on the imports. Increase in real interest rates in relation to foreign interest rates could positively influence the financial inflows into the financial account. This could cause a real appreciation of Sri Lankan rupee, negatively impacting the exports of Sri Lanka. Although trade dependence ratio decreases due to the increase in real interest rates, it may not have an appreciable impact on the trade balance. In addition, domestic interest rates may not have a major impact on net foreign factor income and net transfers. That could be a reason for the interaction between real domestic interest rates and trade dependence ratio not to have a significant impact on the current account balance. Real interest rates directly impact the fiscal deficit of the Sri Lankan government, considering that domestic public debt to GDP ratio stands at 64.5% of GDP by 2022. In 2022, Sri Lankan government earned 13.2% of its tax revenue through import duties and ports and airport development levy (CBSL, 2022). In addition, according to the US international trade administration website, value added tax and excise tax are imposed on some imported goods and services.

Moore (2017) has discussed the long-term revenue decline of the government of Sri Lanka. The IMF (2016) also pointed out this issue and made recommendations to improve the fiscal position of the government by increasing direct taxation in Sri Lanka's

16th IMF program. According to annual publication issued by the Central Bank of Sri Lanka in 2022, the tax revenue as a share of GDP was 7.4% and 7.3% in 2021 and 2022 respectively. Income tax contributed only 31% of total tax revenue of the government according to the same report. The biggest expenditure item in the government's budget was the interest bill in 2021 and 2022. The Sri Lankan government spent 72% and 78% of its total revenue on interest payments. The share of salaries and wages in the total government revenue was 57.8% and 48% of its total revenue in 2021 and 2022 respectively (Central Bank of Sri Lanka, 2022).

State owned enterprises established as part of the import substitution policy between 1956-1977 have continued to be a drain on the treasury and has continued to cause problems in the current accounts. IMF (2023) discusses the off-budget subsidies offered through state owned enterprises by pricing their goods and services below cost recovery level. These subsidies have been financed by state banks. Some of these financings are denominated in foreign currencies and most of these state-owned enterprises that have received these financings do not earn foreign income. This situation has also contributed to the sovereign debt crisis of Sri Lanka.

Advocata (2022) points out that between 2015 and 2020 out of 52 strategic state-owned enterprises (strategic SOEs are determined by the Treasury of Sri Lanka) 17 SOEs recorded negative return on assets and 27 SOEs recorded positive return on assets that were below the government cost of borrowing. These strategic SOEs came from a variety of economic sectors such as banking, finance, energy, insurance, ports, aviation, transportation, tourism, media, wholesale and retail trade.

The IMF published a report in 2023 to identify weaknesses in the governance institutions that are directly involved in economic policy making in Sri Lanka. This report points out that poor financial management, corruption vulnerabilities in the public procurement, weaknesses in tax policy making and administration, lack of autonomy in the central bank, and lack of clarity in property rights have resulted in poor economic outcomes as can be seen in large fiscal and current account deficits, high inflation and public debts, low foreign direct investments and lacklustre economic growth rates. Although the IMF has set a timeline for the Sri Lankan government to take corrective actions, lack of ownership of these reforms cast doubts about their success in the long run.

The Sri Lankan government must raise its share of direct income tax, cut down the public sector salary bill and restructure state owned enterprises in order to put the government finances in order. Restructuring state owned enterprises will help streamline the public service. The government will have more fiscal space to build much needed infrastructure and strengthen social safety nets. To make government finances sustainable, it is also essential that the government reduce its debt service payments by restructuring its public debt.

The share of international trade as denoted by imports and exports in the GDP has been steadily declining since 2000. In 2000, the share of international trade was 88.6%. By 2022 this share has declined to 46.5%. At the same time, GDP growth has had a statistically significant albeit negative impact on the current account balance. Athukorala and Wagle (2022) have shown that the share of non-tradeable sector in Sri Lanka's GDP has been steadily rising since 1959. They also show that external debt to tradeable GDP ratio been rising since 2007. The influx of foreign loans that started flowing into the country

from 2007 powered the growth spurt which lasted between 2010 and 2012. Athukorala and Wagle (2022) shows that economic growth during this period was led by the non-tradeable sector. To improve the current account balance, Sri Lanka should change its growth trajectory to a one led by exports.

Government expenditure on education and health as a share of GDP was only 1.5% and 1.3% respectively in 2022. Out of these expenditures, capital expenditure share of education and health only consisted of 11.7% and 15.6%. Investments in education and healthcare can be used as the foundation to enhance productivity and achieve long term economic growth.

Error term in both the ARDL model and VAR model contains foreign interest rate. According to the IMF report published in 2023 when they approved 17th IMF program of Sri Lanka, public debt stood at 114.4% of GDP by 2021. Out of this public debt, foreign debt component was 46% of GDP. Public debt to GDP ratio rose to 128.1% by 2022 out of which foreign debt comprised 63.6% of GDP (IMF, 2023a, p.49). Sri Lankan government made an interest payment of 1.7% and 1.6% of GDP on their external debt in 2020 and 2021. This figure came down to 0.5% of GDP in 2022 mainly due to suspension of external debt servicing in that year. Therefore, foreign interest rate can be expected to have a significant influence on the fiscal deficit of Sri Lankan government. According to the same IMF report referenced earlier external debt of Sri Lanka was 62.6% and 64.4% of GDP respectively. This figure increased to 78% of GDP by the end of 2022 (IMF, 2023a, p.49). The interest cost on external debt was 1.9% and 1.6% of GDP in 2020 and 2021 respectively. This figure came down to 1% of GDP in 2022. Therefore, foreign interest rate can also be expected to have a significant influence on the current account balance in Sri

Lanka. Higher economic growth can lead to lower foreign interest rates. The reverse can happen too. Therefore, a correlation exists between economic growth and foreign interest rates. Declining foreign interest rate can encourage foreign financial flows into Sri Lanka. But these financial flows also depend on the domestic interest rates and expectations about domestic currency depreciation. These foreign financial flows can cause real appreciation of the domestic currency. Rising foreign interest rates can lead to recessions in the major export destinations of Sri Lanka, impacting the exports negatively. Rising foreign interest rates can also lead to appreciation of currencies in major import sources of Sri Lanka, which could make imports expensive. Considering above factors, foreign interest rates are correlated with all the explanatory variables in the ARDL and VAR model. Future research can investigate the influence of the weighted average foreign interest rates, along with the other variables in this study on current account balance.

Another variable that can be included in the future research is the financial flows in and out of the country proxied by external debt to GDP ratio and foreign assets to GDP ratio. It would also be interesting to investigate the impact of same variable in this study when they are in the natural log form.

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