Fiscal Deficits and Growth in Sri Lanka

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Abstract

This paper examines the growth effects of fiscal deficits in the light of policy debates on the Sri Lankan economy during the period 1970 to 2015. More specifically, the study attempts to answer whether persistent increase in fiscal deficits hindered or supported economic growth over the last three decades. If it were concluded that economic growth has been negatively affected by fiscal deficits, then deficits targeting within the Sri Lankan economy becomes extremely important. On the contrary, if fiscal deficits have positively affected economic growth, then controlling the size of fiscal deficits becomes expensive in terms of economic development. Empirical evidence based on the impulse response function showed that increase in fiscal deficits had a negative and significant impact on economic growth, implying that policy makers needed to control high levels of fiscal deficits in order to achieve desired levels of growth. This finding further confirms the presence of neoclassical notion in the context of the Sri Lankan economy. The results also provide an additional argument in favour of expeditiously implementing ambitious strategies for deficits reduction. And failure of implementing ambitious strategies will put an additional burden on fiscal sustainability, which could further undermine growth prospects of Sri Lanka.

Keywords: Fiscal deficits, economic growth, openness, Sri Lanka.

JEL Codes : H62, F43, F13,

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1. Introduction

It is well established in the macroeconomic literatures that maintaining macroeconomic stability is an essential prerequisite for robust and long-term growth. Policy uncertainty created by macroeconomic instability affects growth through the volatility of returns on investment and misallocation of resources as price signals become distorted (Fischer, 1993; and Fatas and Mihov, 2013). Although instruments of fiscal policy are widely being used to maintain price stability and to achieve better financial management (Jayasundara, 1986), a persistence increasing high levels of fiscal deficits have created several repercussions in maintaining macroeconomic stability and emphasised the importance of managing fiscal sustainability in most of the developing economies. As large fiscal deficits reduces aggregate savings and may lead to high inflation, high interest rates, and balance of payments pressures, with negative growth consequences, extensive attentions have been devoted on the impacts of fiscal deficits on growth in both developed and emerging economies in the recent past.

The economic theory highlights that there is a link between fiscal deficits and economic growth. An increased fiscal deficits leads to an increase in interest rate, which in turns increases interest rate and reduces investment and as a result slows down growth of capital stock and economic activities. Therefore, when fiscal deficits show a continuously increasing trend over the period, it can considerably reduce country's capacity to produce goods and services (Saleh, 2003). Further, an upsurge in interest rate would cause to an exchange rate appreciation, which in turn can create lower net exports, and resulting in trade deficits and a slowdown in economic activities. However, over the period, the experience in many developing economies suggests that despite economies attempted to control level of fiscal deficits, a reduction in fiscal deficits has not always results to a better economic outcomes. In particular, if a reduction in fiscal deficits is achieved by a reduction in expenditure, notably through a reduction in development expenditure rather than by an expansion in revenue collection, the long run impact of such a reduction of fiscal deficits may indeed be negative in terms of economic growth, which in turn can hinder the generation of government revenues for financing public expenditure.

The channels through which fiscal deficits can potentially affect economic growth are diverse. Numerous studies have extensively examined the impacts of fiscal deficits on economic growth through various channels in both developed and developing countries. More specifically, many studies have focused on the impacts of fiscal deficits on inflation, economic growth, interest rate, exchange rate, private investment, and current account deficits. Although all these variables are important elements in maintaining macroeconomic stability, it is also noted that these factors on the other hand do play an important role in growth determination too. In this context, although there is no direct relationship between fiscal deficits and economic growth, the possible growth effects of increasing fiscal deficits need to be examined through its implications on other macroeconomic variables.

There has been considerable research inquiry into the causes and nature of differences in growth rates across countries and regions over time. Even small differences in these growth rates, if cumulated over a long period of time, may have substantial impact on the living standards of the people. Despite considerable research on the subject, cross-country and cross-regional income disparities are on rise over time. Against this background, one important

question refers to the economic consequences of a regime of high and potentially persistent fiscal deficits. In this context, this study focus on the issues related to the impacts of fiscal deficits on economic growth in Sri Lanka. More specifically, the study attempts to address a research question on have growing fiscal deficits really helped in promoting growth in Sri Lanka and thereby the study clearly trying to identifying whether fiscal deficits have contributed or not, to the growth performance of Sri Lanka. Further, while economic growth rate is likely to have a linear negative impact on the fiscal deficits-to-GDP ratio, high levels of fiscal deficits are likely to be harmful for growth. Potentially, this effect is non-linear in the sense that it becomes relevant only after a certain threshold has been reached. It is precisely this non-linear relationship that the present paper seeks to investigate.

The rest of the paper is organised as follows. Section two presents the theoretical and empirical evidence on the relationship between fiscal deficits and economic growth. Section three devoted to analyse the historical pattern of fiscal deficits in Sri Lanka. Section four examines data, model and estimation results. Final section presents the conclusion.

2. Literature Review

Theoretically, there are three major schools of thoughts2 pertaining to the growth effects of fiscal deficits; the neoclassical perspective, the Keynesian perspective, and the Ricardian Equivalence Hypothesis (REH). Fiscal deficits imply a reduction in the level of public saving. According to the neoclassical views, a reduction in national saving can have a negative impact on economic growth if the reduction in government saving is not fully compensated by a rise in private savings. As this could place a pressure on domestic interest rates, it can ultimately undermine the level of output in the economy. However, the Keynesian paradigm argued in favour of the positive impacts of fiscal deficits on economic growth, in particular through public expenditure multiplier which in turn emphasised as a key policy variable to stimulate growth. More specifically, it asserts that fiscal deficits can enhance savings and investment even when the interest rate rises. This is largely due to the creation of employment opportunities or the utilisation of unutilised human and other resources which can enhance the productive capacity of the economy. However, at full employment, deficits would lead to crowding out even in the Keynesian paradigm.

The Ricardian equivalence hypothesis advanced by Barro (1989) emphasizes that fiscal deficits is immaterial and claims it is neutral in terms of its impact on growth. It argues that changes between taxes and fiscal deficits do not affect real interest rate, level of investment, and the current account balance. Further, this approach implies that the government's financing decisions do not matter. In this context, the theory emphasizes that policy makers only need to be concerned with the size and composition of public expenditure and revenue to establish the growth effects of fiscal deficits. Considering the importance of these different approaches, some of the relevant empirical studies in this area have been highlighted below.

Although a large number of studies have showed positive or negative impacts of fiscal deficits on growth, some of the studies have highlighted mixed results. There are number of

[2] While the neoclassical and Ricardian schools focus on the long run; the Keynesian view focuses on the short run effects.

factors including time dimension, types of countries, types of government administration, the degree of fiscal deficits, and the method of data analysis attributed to various outcomes in the empirical literature (Rahman, 2012). These contrasting approaches have resulted in many discussions in both developed and developing economies on the role of fiscal deficits in the process of economic growth over the period. Considering the importance of these different approaches, relevant empirical studies in this area have been discussed below.

Vuyyuri et al, (2004), examined the relationship between fiscal deficits of India with other macroeconomic variables such as nominal effective exchange rate, GDP, consumer price index and money supply (M3) using cointegration approach and Vector Error Correction Models (VECM) over the period 1970 to 2002. The author concludes that there is a bi-directional causality between fiscal deficits and nominal effective exchange rates. However, the study did not find any significant relationship between fiscal deficits and other variables namely GDP, Money supply and consumer price index. In addition, the Author found despite the fiscal deficits was Granger caused by GDP, but the fiscal deficits did not have any reciprocal relationship.

Buscemi and Yallwe (2012) analysed the effects of fiscal deficits on sustainability of economic growth for three emerging countries: China, India and South Africa using the reduced form of Generalized Method of Moment's (GMM) method for dynamic panel data over the period 1990-2009. They found that the coefficients for fiscal deficits results are significant and positively correlated to economic growth. Bose et al (2007) also found the similar results using panel data for the period 1970 to 1990 for 30 developing countries. They suggested that fiscal deficits had a positive impact on growth rate and in particular they highlighted that it was mainly as a result of increased in productive expenditure such as education, health and capital expenditure.

However, some of the studies in this field have cited the negative impacts of fiscal deficits on economic growth. Fatima et al, (2011) studied the impact of government fiscal deficits on investment and economic growth using time series data from 1980 and 2009 in Pakistan. The study showed the negative impacts of fiscal deficits on economic growth. They also found that fiscal deficits create many problems such as high level of inflation, current account deficits, and high level of debt in the economy. Fatima et al (2012) again investigated the impact of the fiscal deficits on economic growth in Pakistan using time series data over the period 1978 to 2009. The findings showed a negative impact of fiscal deficits on economic growth and suggested that the government require to avoid certain levels of the fiscal deficits in order to achieve the desired level of economic growth. Huynh (2007) concluded a negative impact of fiscal deficits on the GDP growth while simply analyzing the trends in budget deficits and economic growth in Vietnam over the period of 1990to 2006. A study conducted by International Monetary Fund (IMF) during the mid-1980s among group of developing countries also concluded that countries with high fiscal deficits had significantly lower economic growth than countries with low to medium fiscal deficits.

Similarly, Rahman (2012) examined the relationship between fiscal deficits and economic growth in Malaysia by employing quarterly data over the period 2000 to 2011. Although the author found that there was no long run relationship between fiscal deficits and economic

growth which is consistent with the Ricardian equivalence hypothesis3, he showed that expenditure had a positive and significant impact on long term economic growth. Similarly, Fatima et al. (2011) also examined the impact of government fiscal deficits on investment and economic growth in Pakistan using time series data over the period 1980 to 2009. The study found that increasing fiscal deficits has undermined the growth objectives and thereby adversely affected the physical and social infrastructure within the economy.

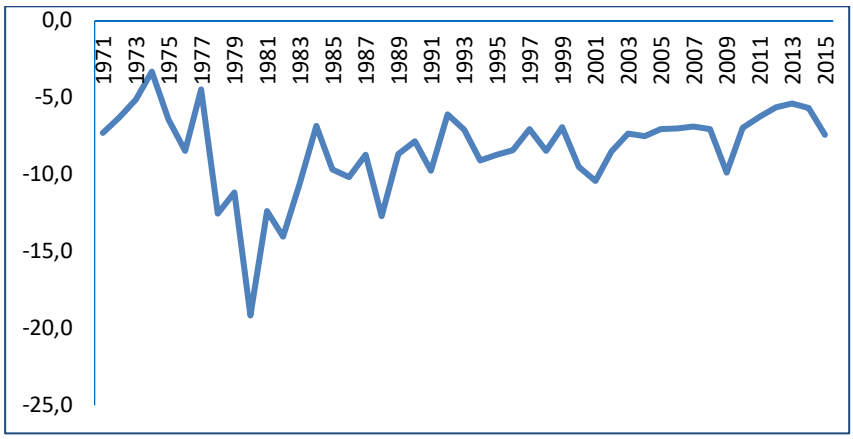
Keho (2010) investigated the causal relationship between fiscal deficits and economic growth in the seven member countries of the West African Economic and Monetary Union using time series data. The empirical evidence showed mixed results. In three cases, the study did not find any causality between fiscal deficits and growth. However, in the remaining four countries, the author found that deficits had adverse effects on economic growth. These findings led to support the budgetary rule aiming at obtaining positive total budget surplus as a prerequisite for sustainable growth and real convergence within the monetary union. Similarly, Vazquez and Rider (2006) examined the effects of fiscal decentralization for two fast growing emerging economies namely, India and China and the study concluded that neither country is fully using the potential of fiscal decentralization to improve allocation of resources and to attain their growth potentials. Although both countries experiencing high rates of growth, the pace and the quality of the growth could have been even higher if appropriate fiscal reforms were undertaken in their inter-governmental fiscal systems.

3. Historical Patterns of Fiscal Deficits in Sri Lanka

Fiscal deficits in Sri Lanka rose significantly over the past decades and this trend was generally accompanied by an expansion in the size of the government. The government's budget is primarily used as a mean of mobilizing resources to promote economic growth, as a mean of attaining social welfare objectives and as an instrument of demand management policies (Jayasundara, 1986). In this regard, fiscal deficits refer to the excess of the public sector's spending over its revenue. According to Jhingan (2002), the phrase "deficits financing" is used to mean any public expenditure that is in excess of current revenues. Similarly, fiscal capacity determines a country's ability "to finance larger fiscal deficits without creating any problem for macroeconomic stability and debt sustainability" (World Bank 2009). However, a continually increasing high level of fiscal deficits in a developing economy like Sri Lanka would create a severe issue in maintaining macroeconomic stability. Moreover, a higher level of fiscal deficits implies the requirements of high government borrowing and high debt servicing which in turn can place pressure on the government to reduce its expenditure on certain sectors such as health, education and infrastructure in order to control the increasing fiscal deficits and to maintain internal stability. However, it is also noted that a reduction in these expenditures can reduce the level of human as well as physical capital in an economy which can positively contribute towards the long term growth rate.

Figure 1: Fiscal Deficits in Sri Lanka (Percentage of GDP)

[3] Ricardian equivalence hypothesis claimed that there is neutral relationship between budget deficit and economic growth.



Source: Central Bank of Sri Lanka

The above Figure 1 presents the trend of fiscal balance as a percentage of GDP during the period 1970 to 2015 in Sri Lanka. Despite country experienced with the positive fiscal balance during 1950s, with the increasingly negative trend of revenue and expenditure following the economic liberalisation, the economy was marked by a significant change in its fiscal activities. As a result of high levels expenditure resulting in expenditure revenue gaps, fiscal balance has remained highly volatile under the period reviewed in this study.

Reinhart and Rogoff (2010) argue that war debts may be less problematic for future growth partly because the high war-time government spending comes to a halt as peace returns, while peacetime debt explosions may persistent for longer periods of time. The accumulation of government fiscal deficits during 1983-2008 was in general occurred mainly in relation to wars. Large fiscal deficits took place in 1980 which was 19.2 per cent of GDP and then it gradually decreased to 6.8 per cent in 1984. However, this positive tendency appeared temporary and the fiscal deficits to GDP ratio move slowly up in succeeding years to 9.7 per cent in 1985 and 12.7 per cent in 1988. The significant increase in fiscal deficits was mainly driven by decreased government revenue[4] and increased public expenditure especially on food subsidy and defense. Further, a sharp increase is noted after the mid-1980s as a consequence of the massive increase in public expenditure on infrastructure during the initial stage of trade liberalisation. However, the most noticeable trend persisting over the recent five years has been a decline in total fiscal deficits as percentage of GDP, which decreased from 10.4 percent in 2001 to7.0 per cent in 2010 and then decreased again to 5.4 per cent in 2013. Improvement in both revenue and expenditure contributed to this noteworthy achievement. Government revenue exceeded the target, while expenditure was maintained within the original budgetary allocation, narrowing the government's gap and reducing the government's financing requirements (CBSL, 2010). Therefore, in recent years Sri Lanka has experienced fiscal deficits ranging from 6 per cent to 9 per cent of GDP between 2006 and 2015. Although the fiscal deficits declined to around 7.4 per cent of GDP in 2015, it is still considered to be a major issue facing the economy in maintaining its macroeconomic stability[5]. Hence, a significant rise in government revenues is necessary to maintain fiscal sustainability, and to achieve the government's economic targets.

[4] This can be due to narrow tax base and inefficiency of tax collection in Sri Lanka.
[5] High fiscal deficit has increased aggregate demand results an inflationary pressures and higher external current account deficits.

The objective of government financing is to mobilize financial resources, taking into account elements of cost and risk, as well as any macroeconomic and monetary implications (Montfort Mlachila et al, 2002). Further, the impact of fiscal deficits on economic growth is theoretically explained through the effect of fiscal deficits on the flow of money into the economy and through the supply side6. The more government expenditure exceeds revenue the more money will be circulated in the economy, which leads to higher employment and output (McCandless, 1991). On the other hand, the larger amount of public borrowing can also crowd out private investment. Nevertheless, issues arise when a government needs to finance its fiscal deficits which have been generated as a result of current expenditure rather than the capital expenditure.

While an economy can finance its fiscal deficits through domestic as well as foreign sources, yet these could generate negative consequences on other macroeconomic variables. For instance, fiscal deficits which are financed by the Central Bank can lead to inefficiencies in financial markets and can cause high inflation7 in the economy (Shojai, 1999); on the other hand bond financing of fiscal deficits can lead to a rise in interest rates which in turn can crowd out private investment. Furthermore, increasing fiscal deficits can also distort the real exchange rate, which in turn undermines the international competitiveness of the economy and thereby generates external imbalances. Hence, the problems arise when the deficits level becomes too high and there is a persistent need to finance it.

4. Empirical Model, Data and Results

This section employs the econometric techniques to examine the dynamic relationship among the selected variables. The Augmented Dickey Fuller (ADF) and Phillips Perron (PP) tests are employed to examine the order of integration of each time series variable. The unit root test was conducted both for the levels and the first differences of each series. Further, Johanson and Juseliues (1990) method was used to examine the long run relationship among the variables selected in this study. The impulse response function was used to examine the dynamics of the selected variables in response to various shocks. Meanwhile, the Granger causality test was used to determine whether one time series is useful in forecasting another. The optimal lag length that was selected in this study was based on lag order selection criteria (AIC or SBC) that minimize the overall sum of squared residuals or maximizes the likelihood ratio. Further, the descriptive statistics of the variables used in this study are given in the appendix Table A2.

4.1 Impact of Fiscal Deficits on Economic Growth

This section investigate the direct impact of fiscal deficits on economic growth in Sri Lanka covering the period 1970-2015 employing annual time series data published in the various annual reports of the Central bank of Sri Lanka. The empirical growth model used in this study

[6] Fiscal deficit used for creating infrastructure and human capital will have a different impact than if it is used for financing targeted subsidies and recurrent expenditure.

[7] However, government expenditure on productive development projects in developing countries will not create inflationary situation in the economy since it can be assumed this projects generates greater output in the economy and in turn leads to lower the price level (Rao, 1953).

is based on a conditional convergence equation8 which indicates that the GDP growth rate depend on the initial level of income per capita, the investment-to-GDP rate and the population growth rate. However, as the present study mainly attempts to examine the impact of fiscal deficits on growth, the above convergence model was augmented to include the level of fiscal deficits (as a share of GDP) and other related variables. Other control variables that included in to the growth equation were the long-term real interest rate (to capture the impact of inflation and the effects of the fiscal-monetary policy mix), indicators for the openness9 of the economy. This would help to expand the model beyond a closed-economy. The list of the variables used in this study are summarised in appendix Table A1. Further, the unit root test results are provided in appendix Table A3.

The basic estimation equation (1) and it measures the direct effect of fiscal deficits on economic growth.

$$g_{it+k} = \alpha_0 + \alpha_1 \ln PCGDP_{it} + \alpha_2 FD_{it} + \alpha_3 FD^2{}_{it} + \alpha_4 GCF_{it} + \alpha_2 POG_{it} + \alpha_3 OPP_{it} + \alpha_4 LIR_{it} + \varepsilon_{it} \quad (1)$$

Table 1: VAR Lag Order Selection Criteria[10]

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-617.6300	NA	19520.32	29.74429	30.03390	29.85044
1	-461.9683	252.0238*	125.5855	24.66516	26.98205*	25.51439
2	-416.1214	58.94603	177.8009	24.81530	29.15948	26.40761
3	-350.8009	62.20998	145.7248	24.03814	30.40959	26.37353
4	-263.4270	54.08861	95.88180*	22.21081*	30.60955	25.28928*

* indicates lag order selected by the criterion
Source: Authors Calculations

Table 1 presents the results of VAR lag order selection criteria. According to the Sequential modified LR test statistic (LR), Final Prediction Error (FPE), Akaike information criterion (AIC), Schwarz information criterion (SC), and Hannan-Quinn information criterion (HQ) suggest that the optimum lag order for VAR in this model is four. Therefore the subsequent analyses in this study were based on four lags[11].

Table 2: Johansen Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**

[8] Convergence refers to the process by which relatively poorer regions or countries grow faster than their rich counterparts. Conditional convergence implies that a country or a region is converging to its own steady state.
[9] The sum of export and import shares in GDP.
[10] The endogenous variables considered in this study to examine the optimal lag are economic growth rate, fiscal deficit as a percentage of GDP, private sector credit as a percentage of GDP, population growth rate, openness, investment as a percent of GDP and long term interest rate.
[11] Since the number of observations in the time series was 46, with the purpose of avoiding the degrees of freedom problem the maximum number of lags was selected as four in the study.

None *	0.795973	178.7523	125.6154	0.0000
At most 1 *	0.613018	110.4036	95.75366	0.0034
At most 2	0.472546	69.58042	69.81889	0.0522
At most 3	0.397230	42.07356	47.85613	0.1567
At most 4	0.291797	20.30612	29.79707	0.4023
At most 5	0.104193	5.470087	15.49471	0.7570
At most 6	0.017035	0.738804	3.841466	0.3900

Trace test indicates 2 cointegrating equations at the 0.05 level, * denotes rejection of the hypothesis at the 0.05 level, **MacKinnon-Haug-Michelis (1999) p-values
Source: Authors Calculations

Table 3: Johansen Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.795973	68.34870	46.23142	0.0001
At most 1 *	0.613018	40.82322	40.07757	0.0411
At most 2	0.472546	27.50686	33.87687	0.2372
At most 3	0.397230	21.76744	27.58434	0.2325
At most 4	0.291797	14.83603	21.13162	0.3005
At most 5	0.104193	4.731283	14.26460	0.7753
At most 6	0.017035	0.738804	3.841466	0.3900

Max-eigenvalue test indicates 2 cointegrating equations at the 0.05 level, * denotes rejection of the hypothesis at the 0.05 level, **MacKinnon-Haug-Michelis (1999) p-values
Source: Authors Calculations

The trace statistic and maximum Eigen value given in Tables 2 and 3 suggest that there exist at least 1 cointegrating vector among the seven variables considered in equation 1. The findings of this cointegrating vector imply that there exists a stable long-run equilibrium relationship between the economic growth, investment, fiscal deficits, long term interest rate, openness and growth rate of population during 1970 to 2015 in the Sri Lankan economy.

Table 4: Estimated Long Run Equation

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-12.9719	8.10504	-1.60048	0.1178
PCGDP	0.75795	0.58719	1.29080	0.2046
FD	-0.13005	0.46396	-0.28029	0.7808
FD^2	-0.01646	0.02273	-0.72403	0.4735
GCF	0.24999***	0.08274	3.02129	0.0045
POG	0.76749*	0.39104	1.96269	0.0570
OPP	1.02604	0.64912	1.58066	0.1222
LIR	0.10216	0.07169	1.42519	0.1623
R-squared	0.42401	Mean dependent var		4.83695
S.E. of regression	1.69232	Akaike info criterion		4.04686
Sum squared resid	108.831	Schwarz criterion		4.36488
Log likelihood	-85.0777	F-statistic		3.99623
Durbin-Watson stat	1.86831	Prob(F-statistic)		0.00229

Method	Least Squares	Included observations	46

Dependent Variable: Growth Rate of GDP.
Note: *, **, and *** imply the significance at 10%, 5% and 1% respectively.
Source: Authors Calculations

As summarised in Table 4, we find that the annual change in the gross domestic capital formation (investment) is statistically significant and positively associated with the economic growth. This implies that the investment plays an important role in expanding economic activities in the Sri Lankan economy. Meanwhile, the study also finds that the population growth in Sri Lanka has a positive and statistically significant impact on the output growth. Turning to the fiscal deficits variable, somewhat surprisingly, no direct and significant impact of fiscal deficits on economic growth is found; rather the impact may be indirect through the channel of long term interest rates. Increased deficits may increase interest rates and thus slow down economic growth. At the initial analysis, as the usage of fiscal deficits in a linear form does not yield significant results, we used a quadratic equation in fiscal deficits which would help to understand whether there exists a non-linear impact of fiscal deficits on growth. However, a nonlinear relationship between fiscal deficits and economic growth cannot be identifying from the above results.

4.2 Temporary Shocks to Fiscal Deficits

While the economic growth rate is likely to have a linear negative impact on the fiscal deficits-to-GDP ratio, high levels of fiscal deficits also likely to be harmful for economic growth, but potentially after a certain threshold has been reached. From a policy perspective, a negative impact of fiscal deficits on economic growth strengthens the arguments for ambitious deficits reduction through fiscal consolidation. This section seeks to examine this relationship using the impulse response function which describes the dynamic behavior of the variables. Further, this function exhibits reactions of endogenous variables to shock from error term in equation.

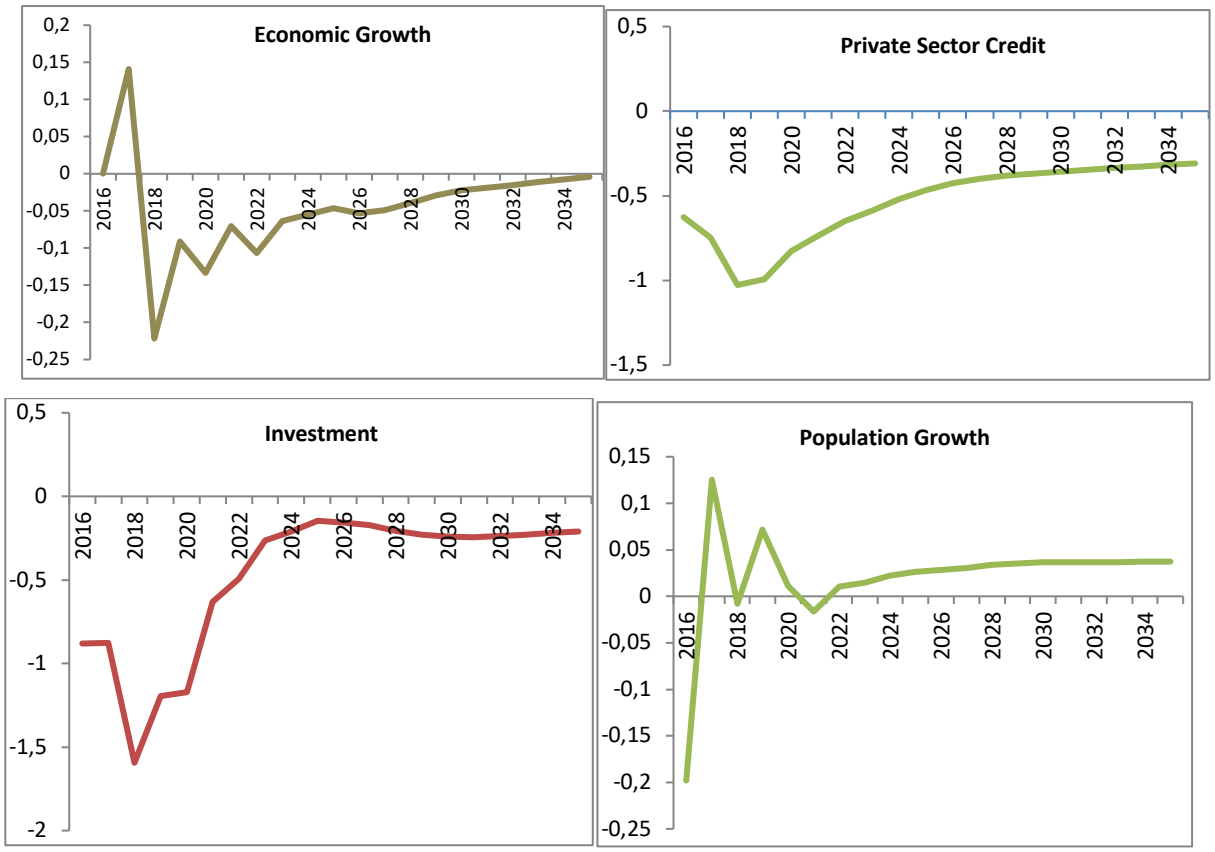
Figure 2 depicts dynamic response functions following a temporary fiscal deficits shock equal to a one-percentage point increase in steady state output. All dynamic responses are shown as percentage-point deviations from steady state. The behavior of the impulse response functions following a fiscal deficits shock are in line with our expectations. An increase in fiscal deficits generates a negative effect on economic growth. Economic growth increases immediately after the shock and stays negative for a sustained period of time in the medium to long term although it has positive impact on growth in the short term. This indicates that an increase in the fiscal deficits as a proportion of GDP decreases economic growth in the case of Sri Lankan economy. The negative effect of fiscal deficits on economic growth appears to satisfy the neoclassical growth model developed by Solow (1956) and Swan (1956), which indicates that an increase in fiscal deficits would reduce economic growth.

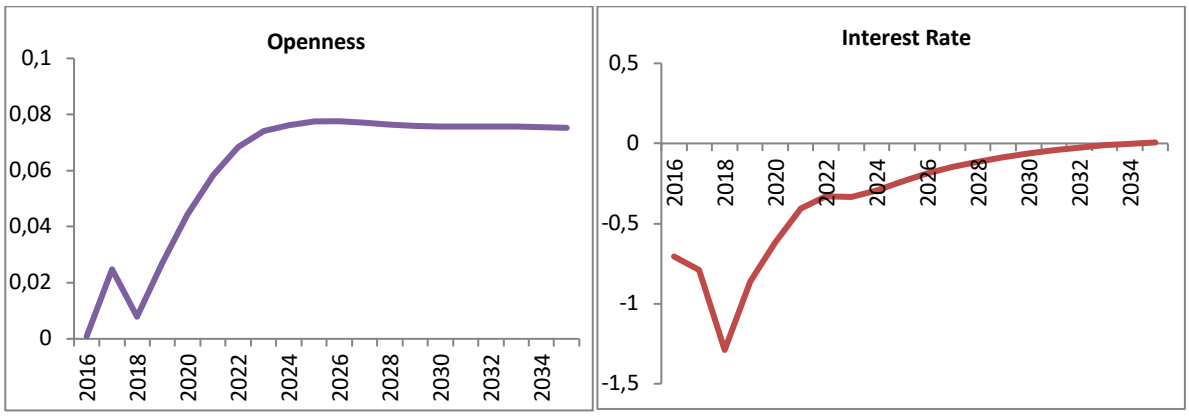
The above negative impacts of fiscal deficits on economic growth in case of Sri Lankan economy can be explained from two ways. First, this might be as a result of increases in unproductive expenditure such as defense, subsidy and interest payments in the economy. Secondly, this may be as a result of an impact of fiscal deficits on other macroeconomic variables such as interest rate, inflation and exchange rate. The negative effects of fiscal deficits

on economic growth could be partly due to the nature of financing mechanisms adopted by the economy to fulfill its deficits financing requirements during the period under reviewed, which is dominated by domestic sources especially from market and non-market borrowings. Thus, the findings suggest that the government should avoid high levels of its fiscal deficits in order to achieve the desired level of growth. However, since the scope of this study is limited only to fiscal deficits and economic growth, the findings of this study pave the way to explore the overall effect of fiscal deficits on all other variables in the future. This model-based finding runs somewhat counter to Eisner and Pieper (1987), who finds that the positive impact of fiscal deficits on economic growth in the United States and other OECD countries. However, the findings of this study seems consistent with some other studies such as Fatima et al, (2011) who finds negative impacts of fiscal deficits on economic growth, and show that fiscal deficits creates many macroeconomic problems in the economy such as high levels of inflation, current account deficits, and high level of debt which hinders the expansion of economic activities. The behavior of the rest of the impulse response functions also accord well with intuition.

Although, our main objective is to identify the impact of fiscal deficits on economic growth, the analysis on the response of economic growth following temporary shocks in macroeconomic aggregates would provide an important insight about the nexus among the variables considered in this study. Furthermore, the literature on the macroeconomic impacts of various shocks on economic growth is relatively scarce in the case of Sri Lankan economy therefore discussion on the impacts of macroeconomic variables on economic growth can also provide a useful benchmark for future analysis in this area.

Figure 2: Dynamic Responses to Fiscal Deficits Shock

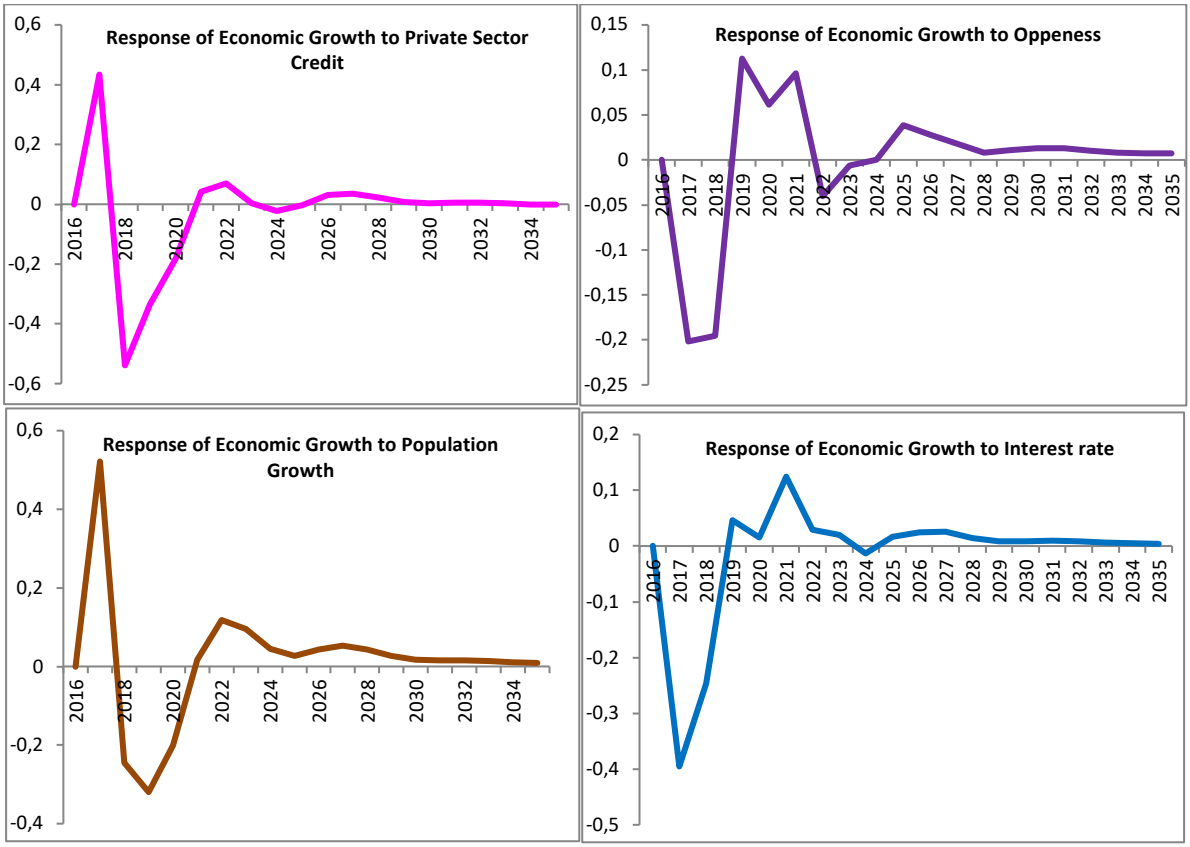




Source: Authors' Calculation
Note: All dynamic responses are reported as percentage point deviations from steady state.

Figure 3 depicts dynamic response functions following a temporary shock equal to a one-percentage point increase in steady state output on selected variables considered in this study. All dynamic responses are shown as percentage-point deviations from steady state. A positive impulse in private sector credit determines a small increase of economic growth in the short term. However, in the medium it tends to move towards negative and takes about five years to reach the steady state level. Meanwhile, it is found that the economic growth in response to a monetary policy shock indicated by increased long term interest rates temporarily move towards downward in the short term and however, it takes about four years to reach its steady state level and then it has a positive impact on the output growth in the medium term. Meanwhile, the decline in interest rate following the fiscal deficits shock has important qualitative and quantitative implications for the behavior of the rest of the variables in the model.

Figure 3: Dynamic Responses to Selected Shocks (percent deviation from baseline)



Source: Authors' Calculation
Note: All dynamic responses are reported as percentage point deviations from steady state.

Meanwhile, the Granger causality test also conducted with the view to examine the lead-lag relationship among the variables considered in this study. The results are reported in appendix Table A4. The estimated results indicate that the null hypothesis of "Fiscal deficits does not Granger cause economic growth" cannot be rejected even at 10 per cent level of significance in all three lags considered in this study. At the same time, all other variables are not found to be Granger causing economic growth in pairs and jointly. Therefore, the empirical results derived from the granger causality test do not reveal any causality between economic growth and the determinants. However, this study could be further extended in the future by considering the composition of financing sources more intensively which can help policy makers to gain a deeper understanding about the relationship between fiscal deficits and economic growth.

5. Conclusion

This paper examined the impact of fiscal deficits on output growth in Sri Lanka over the period 1970 to 2015. Empirical evidence based on the impulse response function showed that increase in fiscal deficits can have a significant long run impact on economic growth, implying that policy makers required to avoid high levels of fiscal deficits in order to achieve desired levels of growth. In particular, the long run response of output with regard to a positive increased fiscal deficits shock is negative. Further, the finding confirms the neoclassical view in the context of the Sri Lankan economy. The results represent an additional argument in favour of expeditiously implementing ambitious strategies for deficits reduction. The high fiscal deficits

will undermine growth prospects and thus will put an additional burden on fiscal sustainability. However, the key issue is the response of private investment to a change in the fiscal deficits. If private investment rises by the same amount as fiscal deficits rises, then there is no change in national saving and no further adjustments would be required. Further, while revenue measures should focus on minimizing distortions, expenditure reforms should primarily address inefficiencies in spending. Such policies would not only provide fiscal space but also contribute directly to medium to long term growth.

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Appendix

Table A1: Data Description and Sources

Variable Abbreviation	Variable Description	Source
EG	Growth rate of GDP	CBSL
$PCGDP$	Natural logarithm of the level of GDP per capita	CBSL
FD	Fiscal deficits as a share of GDP	CBSL
GDCF	Gross domestic capital formation as a share of GDP	CBSL
POG	Population growth rate	CBSL
OPP	Openness (Sum of exports and imports (% of GDP))	CBSL
LIR	Long term interest rate	CBSL
PCR	Private Sector Credit (percent of GDP)	CBSL
ε_{it}	Error term	

Table A2: Descriptive Statistics

	EG	FD	LIR	GDCF	OPP	POG	PCR
Mean	4.8369	-8.2964	11.4367	24.7239	1.9983	1.1776	20.7611
Median	4.9500	-7.4572	11.0400	24.7500	1.3767	1.3396	22.5218
Maximum	9.1000	-3.2939	21.3000	39.1000	5.3461	2.3506	29.1573
Minimum	-1.5000	-19.1591	4.7600	13.7000	0.2632	-2.1323	8.9927
Std. Dev.	2.0491	2.7780	4.8281	5.5064	1.6531	0.7704	5.7888
Skewness	-0.5213	-1.4871	0.2993	0.0466	0.7992	-2.6657	-0.9029
Kurtosis	4.0695	6.6163	1.9233	2.9827	2.1347	11.8810	2.7645
Jarque-Bera	4.2760	42.0209	2.9087	0.0172	6.3320	205.6557	6.3571
Probability	0.1178	0.0000	0.2335	0.9913	0.0421	0.0000	0.0416
Sum	222.50	-381.63	526.09	1137.30	91.92	54.17	955.01
Sum Sq. Dev.	188.94	347.28	1048.98	1364.46	122.97	26.711	1507.98
Observations	46	46	46	46	46	46	46

Table A3: Unit Root Test Results

Variable	Indicator	ADF		PP	
		Level	1st Difference	Level	1st Difference
EG	Statistic	-2.6405	-6.2759	-2.6248	-6.2758
	P-Value	0.4832	0.0004	0.5234	0.0002
PCGDP	Statistic	0.2425	-2.3743	-3.1903	-5.7689
	P-Value	0.9976	0.0095	1.0000	0.0001
FD	Statistic	-5.6049	-4.2268	-3.9809	-10.8245
	P-Value	0.0003	0.0095	0.0161	0.0000
LIR	Statistic	-1.2825	-3.4425	-1.9394	-11.3463
	P-Value	0.8763	0.0615	0.6175	0.0000
GDCF	Statistic	-3.3827	-4.6628	-2.7336	-7.5005
	P-Value	0.0671	0.0035	0.2287	0.0000
OPP	Statistic	-4.2398	-3.6838	-1.6216	-7.0459
	P-Value	0.0097	0.0369	0.7685	0.0000
POG	Statistic	-6.0473	-5.3151	-7.0489	-29.1445

	P-Value	0.0000	0.0006	0.0000	0.0000
PCR	Statistic	-2.6119	-4.3149	-2.0836	-4.0352
	P-Value	0.2772	0.0072	0.5406	0.0145

Note: Critical values are taken from MacKinnon, 1991

Table A4: Pair-wise Granger Causality Testing

Hypothesis	Lag 4		Lag 3		Lag 4	
	F-Statistic	Prob.	F-Statistic	Prob.	F-Statistic	Prob.
FD does not Granger Cause EG	1.1414	0.3542	0.7365	0.5371	1.1840	0.3168
EG does not Granger Cause FD	0.5137	0.7260	0.3645	0.7790	0.5275	0.5942
LIR does not Granger Cause EG	1.0010	0.4210	0.8058	0.4989	1.1794	0.3182
EG does not Granger Cause LIR	0.2859	0.8850	0.1884	0.9036	0.0844	0.9192
GDCF does not Granger Cause EG	0.0551	0.9941	0.0254	0.9944	0.0260	0.9743
EG does not Granger Cause GDCF	1.6463	0.1860	2.7279	0.0582	4.8547	0.0131
OPP does not Granger Cause EG	0.4352	0.7821	0.3612	0.7813	0.2986	0.7435
EG does not Granger Cause OPP	1.9484	0.1256	2.8738	0.0496	0.5593	0.5761
POG does not Granger Cause EG	0.7131	0.5889	0.7180	0.5477	1.1740	0.3198
EG does not Granger Cause POG	0.7223	0.5829	0.9832	0.4115	1.5354	0.2281
PCR does not Granger Cause EG	0.8512	0.5032	1.2269	0.3140	0.9268	0.4044
EG does not Granger Cause PCR	0.1490	0.9621	0.2365	0.8703	0.3485	0.7079
LIR does not Granger Cause FD	0.6063	0.6609	0.4977	0.6862	0.1456	0.8649
FD does not Granger Cause LIR	0.7302	0.5778	0.6697	0.5762	0.8567	0.4324
GDCF does not Granger Cause FD	0.4799	0.7502	0.7798	0.5130	0.9053	0.4127
FD does not Granger Cause GDCF	0.9155	0.4665	0.6425	0.5927	1.0942	0.3449
OPP does not Granger Cause FD	2.7191	0.0463	4.6429	0.0076	7.2106	0.0022
FD does not Granger Cause OPP	8.4343	0.0001	8.2124	0.0003	5.1087	0.0107
POG does not Granger Cause FD	0.7279	0.5793	0.7559	0.5262	0.8484	0.4358
FD does not Granger Cause POG	0.7792	0.5467	0.8263	0.4881	0.7612	0.4739
PCR does not Granger Cause FD	1.1217	0.3630	0.5571	0.6467	0.3235	0.7255
FD does not Granger Cause PCR	0.5006	0.7354	0.3553	0.7855	0.3193	0.7285
GDCF does not Granger Cause LIR	0.5628	0.6912	1.0862	0.3673	0.9179	0.4078
LIR does not Granger Cause GDCF	1.4490	0.2400	2.6215	0.0655	1.4116	0.2559
OPP does not Granger Cause LIR	0.2459	0.9100	0.0715	0.9748	0.1215	0.8859
LIR does not Granger Cause OPP	0.5855	0.6753	0.8148	0.4941	0.7070	0.4993
POG does not Granger Cause LIR	1.2314	0.3165	1.5159	0.2269	2.2362	0.1204
LIR does not Granger Cause POG	1.8189	0.1487	0.8314	0.4854	0.9967	0.3783
PCR does not Granger Cause LIR	1.8505	0.1427	3.6092	0.0224	6.0325	0.0052
LIR does not Granger Cause PCR	2.7177	0.0464	4.0666	0.0138	2.2545	0.1184
OPP does not Granger Cause GDCF	0.3024	0.8742	1.2444	0.3079	0.8917	0.4181
GDCF does not Granger Cause OPP	3.8990	0.0106	5.0109	0.0053	5.5880	0.0073
POG does not Granger Cause GDCF	0.7155	0.5873	1.4532	0.2435	1.0208	0.3697
GDCF does not Granger Cause POG	2.4762	0.0633	2.5672	0.0696	3.5243	0.0392
PCR does not Granger Cause GDCF	0.8128	0.5261	1.5035	0.2301	1.2150	0.3077
GDCF does not Granger Cause PCR	1.4870	0.2285	1.3028	0.2884	0.9480	0.3962
POG does not Granger Cause OPP	0.1484	0.9624	0.2313	0.8740	0.0861	0.9176
OPP does not Granger Cause POG	1.7526	0.1620	2.7663	0.0558	4.3086	0.0204
PCR does not Granger Cause OPP	5.2076	0.0023	6.6531	0.0011	4.7781	0.0139
OPP does not Granger Cause PCR	1.6105	0.1949	1.1663	0.3360	2.2162	0.1226
PCR does not Granger Cause POG	2.69515	0.0477	3.3167	0.0306	3.5310	0.0390
POG does not Granger Cause PCR	1.82621	0.1473	1.7629	0.1717	0.3650	0.6965

Note: Critical values are taken from MacKinnon, 1991

Figure A1: Behaviors of the Variables

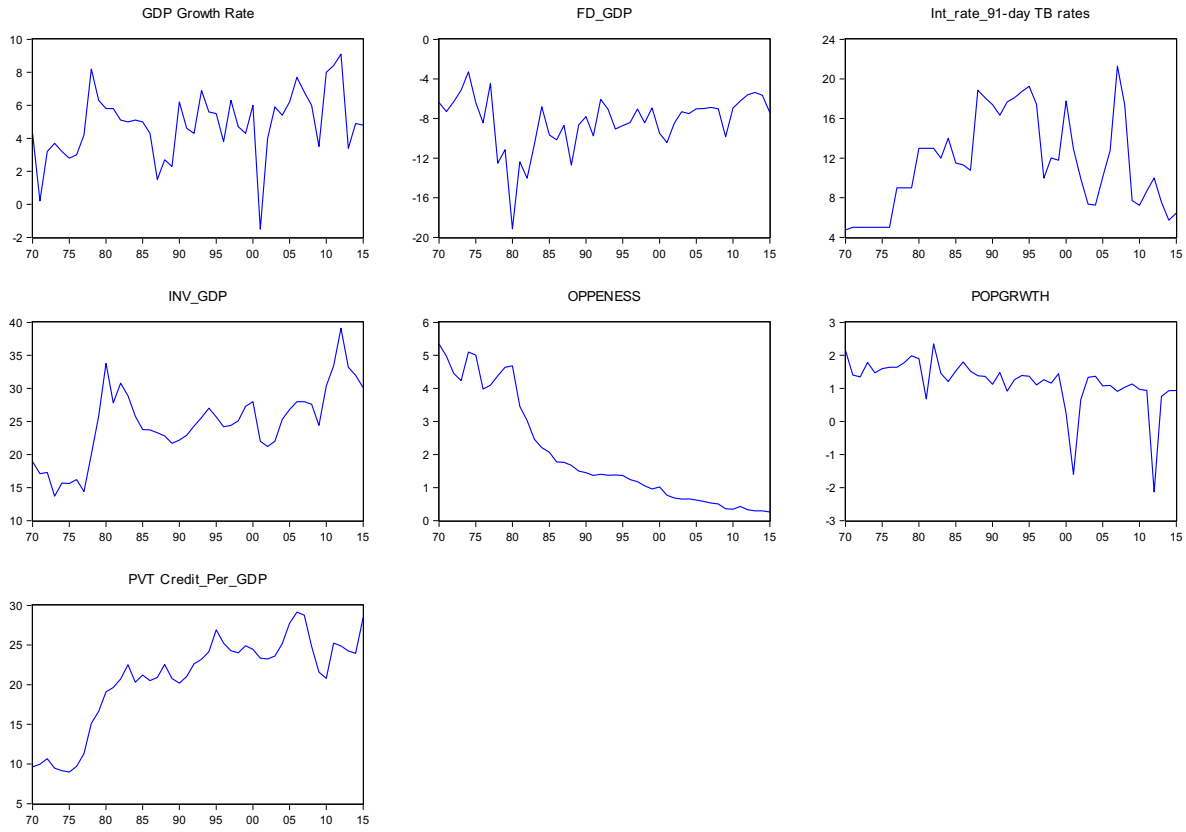

Figure A2: Stability Test of the VAR