Dynamic Linkages between Public Debt and Economic Growth: An Empirical Analysis of Sri Lanka

M. Ushanthiny, S. Sivarajasingham and T. Vinayagathasan

Department of Economics and Statistics, University of Peradeniya, Sri Lanka

Introduction

Increasing public debt in many countries as a result of deficit government budget and balance of payment is one of the serious economics and political issues in many developing countries. Huge public debt is likely to increase the inflation, interest rate and budget deficit. Misztal (2010) found a positive and significant relationship between economic growth and public debt in the Euro zone area while Checherita and Rother (2010); Manmohan and Woo (2010); and Cunningham (1993) identified a strong negative relationship between growth and debt burden. However, Darius (2001) said that although there is an adverse impact on macroeconomic variables due to rising debt of an economy, even an appropriate level of government debt could be linked to economic growth in developing countries.

The amount of public debt has been a critical issue in Sri Lanka for many decades which resulted in socio-economic and political implications. The share of public debt to GDP was 34% in 1960 and it shows an upward trend over the years. Particularly, Sri Lanka has experienced more than 100% debt share to GDP in 2001. However, it was decreased to 79.1% in 2012 (Central Bank of Sri Lanka, 2013). Studies related to the quantitative assessment of the impact of public debt on economic growth are inadequate and limited in Sri Lankan

context. Thus, this research attempts to answer the question: Does public debt induce economic growth?

Objective

The objective of this study is to empirically investigate the dynamic linkages between public debt and economic growth in Sri Lanka covering the period of 1960 - 2012.

Methodology

This study adopted the Neo-classical growth theory. According to that, the growth model is specified as $GDP\ Growth = F(K, L, PD)$, where K is capital, L is labour, and PD is public debt. As in the literature this study uses log of Per Capita GDP ($LPGDP_t$) as a proxy for economic growth. For debt the study uses three proxies; i.e. public debt (PDG_t), internal debt (GID_t), and external debt (GED_t). Capital is indicated by $GINV_t$. The capital, public debt, internal debt and external debt are measured as a percentage of GDP. Annual data were used in this study for the period of 1960 -2012. The data were collected from the annual reports of the Central Bank of Sri Lanka. All the variables are transformed into natural logarithmic values.

Graphical analyses (scatter plot, confidence ellipse) are used to identify the basic feature sand the relationships between the selected variables. The standard unit root test of augmented Dickey Fuller (ADF) is used to determine the order of the integration of the variables. Engle Granger co-integration techniques were employed to identify the long-run relationship between public debt and economic growth, where as Error Correction Model (ECM) was adopted to estimate the impact multiplier effect and error correction process. In addition, the study also used Granger Causality Test to find the direction of causality.

Results and Discussion

The scatter plot with confidence ellipse graph in Figure 1indicatesa negative relationship between GDP growth and public debt growth

Figure 1: Dynamic Linkages between Economic Growth and Public Debt Growth
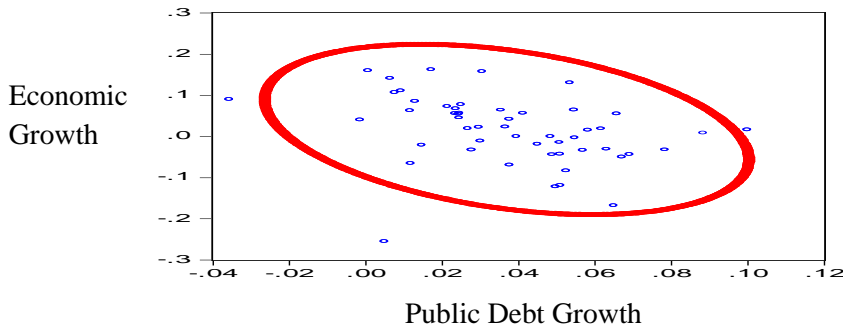
Using ADF unit root test we found that variables are non-stationary at level and we found that they are first differenced stationary (I (1)).

Table 1: Results of the Error Correction Models

Model I:
$\Delta LPGDP = 0.040 - 0.087\Delta LPDG + 0.017\Delta LGINV - 0.624\hat{U}_{t-1} + 0.553 \, AR(1)$ (-2.38) (0.67) (-4.27) (3.47)
Model II: $\Delta LPGDP = 0.038 + 0.019\Delta LGINV - 0.102\Delta LGID - 0.691\hat{U}_{t-1} + 0.517AR(1)$ (0.76) (-2.75) (-5.13) (3.24)
Model III: $\Delta LPGDP = 0.039 + 0.021\Delta LGINV - 0.019\Delta LGED - 0.5951\hat{U}_{t-1} + 0.464AR(1)$ (0.80) (-0.92) (-3.94) (2.80)

Note: t-values are in parenthesis (t values of the intercept terms are not given).

The Engel Granger co-integration test confirms that; public debt and economic growth have a negative and significant relationship in the long run; internal debt and economic growth have a negative and significant relationship in the long run; external debt and economic

growth are not cointegrated in the long run; and capital and economic growth have positive and significant linkages in the long run (The detail results available upon request).

ECM results are given in Table 1. $\widehat{U}_{t-1}$ is the error correction term. Public debt has negative and significant effect on economic growth in the short run. The significant error correction coefficient indicates that there is long run causal relationship between economic growth and public debt and 62% disequilibrium is corrected each year (Model I). Negative sign of the error correction coefficient indicate that per capita GDP growth moves downward towards long run equilibrium path. Second, internal debt also has a negative and significant effect on economic growth in the short run (Model II). The significant error correction coefficient indicates that there is a long run causal relationship between economic growth and internal debt and 69% disequilibrium is corrected each year. Negative sign of the error correction coefficient indicates that per capita GDP moves downward towards long run equilibrium path.

Third, capital (Models I, II, and III) and external debt (Model III) do not have a significant relationship with economic growth in the short-run. The error correction coefficient shows that 59% of disequilibrium is corrected each year. Negative sign of the error correction coefficient indicate per capita GDP moves downward towards long run equilibrium path.

Granger causality test finds no evidence of causality linkage between the variables (The detail results are available upon request) in the short-run. However, error correction term coefficients in the above three equations are negative and statistically significant. This indicates that there is an evidence of long-run causal relationship between economic growth and various debts (public and internal debt).

Conclusion and Policy Recommendations

The findings of co-integration test of this study revealed that public debt and internal debt have an impact on economic growth in the long-run while external debt does not. In addition, there was a positive correlation between capital and economic growth. However, public and internal debt has negatively significant impact on economic growth while external debt and investment do not have significant effect on growth in the short-run. Results revealed a causal relationship (long run) between debt and economic growth in the long-run, even though there was no linkage in the short-run. Hence, these research findings could be useful to policy makers when they formulate and implement fiscal and monetary policy to bring the economy to an accelerated and a sustainable growth.

References

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