Does Budget Deficit Create Financial Crowding Out in Sri Lanka?

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Introduction

Fiscal policy is an important channel that tends to determine the effectiveness of private investment in terms of increasing growth in the economy. While expansionary fiscal policy, by positively affecting private investment (crowding in), might lead to growth in total income of the country, it may also raise interest rates, and thereby reduce private investment. According to existing theories, there are two variants of crowding out effects in an economy– real and financial. The real (direct) crowding out effect occurs when the increase in public investment displaces private capital formation broadly on a one-to-one basis, irrespective of the mode of financing the fiscal deficit. Financial crowding out is the phenomenon of partial loss of private capital formation due to the increase in the interest rates emanating from the pre-emption of real and financial resources by the government through financing of fiscal deficit by credit instruments (Chakraborty 2006).

Research Problem

Gupta (1992) found that Ricardian Equivalence Theorem is rejected for Sri Lanka, India, Indonesia and Philippines among 10 Asian countries, and evidence of crowding out in all the Asian countries except India. Chowdhary (2004) tested possible effects of fiscal actions enumerated earlier on five least developed countries (LDCs) in South Asia including Sri Lanka. For Sri Lanka, the price effect is negative but statistically insignificant and no perceptible influence is seen on the interest rate. However, the dearth of studies directly focusing on the impact of budget deficit on private investment in Sri Lanka motivated us to study whether there is a financial crowding out with reference to Sri Lanka.

Methodology

Though the Neoclassical Flexible Accelerator Model is applicable in explaining investment behavior, some of its assumptions (such as perfect capital mobility, little or no government investment) do not hold valid for poor countries, and therefore, analysing the behavior of developing economies is a real challenge. Government carries out significant functions related to investment in developing countries, and thus, it is difficult to apply standard theories for these countries. To avoid these constraints, this study developed a theoretical model, in which a relationship between private investment and interest rate was constructed using the Neoclassical Flexible Accelerator Model that was used by Chakraborty (2006), and also a relationship between budget deficit and interest rate using the Mundell-Fleming Model, as given below:

$$I_{pvt(t)} = \beta\alpha\,[\,1 - (1-\delta)\,L]\,Y_t^{*} + (1-\beta)\,I_{pvt(\tau-1)}$$

Where, Beta (β) is the responses of private investment to the gap between desired and actual levels of investment, L and Y_t* are the lag operator and the expected output level, respectively.

Here, $\beta = f\,(C_{pvt}, RI_r, I_{pub})$

where; C_{pvt} is the private consumption, RI_r is real interest rate and I_{pub} is public investment. The paper hypothesises that the response of private investment depends on real interest rate.

This study assumes that the real interest rate is a function expressed as :

$$RI_t = f\,(BD_t, MS_t, ER_t, \pi_t^{e})$$

where; BD_t is the budget deficit, $MS2_t$ is money supply, ER_t is the exchange rate, π_t^{e} is the expected inflation rate. Time series data from 1960 to 2007, obtained from the reports of the central bank of Sri Lanka, were used for empirical tests.

We used Augmented Dicky Fuller (ADF) (1979) and Phillips-Perron (1989) methods to test whether the variables are stationary or not. The significance of the break in trend was ascertained using the Chow test. Perron's method (1989) was used to test the unit root in the presence of structural breaks. The optimal lag length is selected on Schwartz-Bayesian Criteria (SBC) and Akaike Information Criteria (AIC). To empirically analyse the long- run relationships and dynamic interactions among the variables of interest, the model was estimated using the bounds testing co-integration procedure [or autoregressive distributed lag (ARDL)], developed by Pesaran *et al* (2001).

$$\Delta RI_t = C_0 + \delta_1 + \delta_1 RI_{t-1} + \delta_2 BD_{t-1} + \delta_3 \pi^e_{t-1} + \delta_4 MS_{2t-1} + \delta_5 ER_t + \sum_{i=1}^{p} \alpha_i \Delta RI_{t-i} +$$

$$\sum_{j=1}^{q} \varpi_j \Delta BD_{t-j} + \sum_{l=1}^{q} \eta_l \Delta \pi^e_{t-l} + \sum_{m-1}^{q} \varphi_m \Delta MS_{2t-m} + \sum_{n-1}^{q} \gamma_n \Delta ER_{t-n} + \varepsilon_t$$

where RI_t is the Real Interest Rate, BD_t is the Budget Deficit Growth Rate, π_t is the Expected Inflation Rate, ER_t is the Exchange Rate and $MS_{2\,t}$ is the Money Supply Growth Rate.

In this equation, the terms with a summation sign represent error correction dynamics, while the terms without a summation sign represent the long run relationships.

Results

The results of the Chow test in terms of F-Statistic and Log Likelihood statistic revealed that ER_t exhibits a break in trend in the year 1981. The results show that economic liberalisation policy has not contributed to creating a break in ER_t in the year 1978, as was expected. The ADF and PP results suggest that RI_t and ER_t are stationary in level form while BD_t, π_t , MS_{2t} are stationary in first difference form and integrated of order one, ie, I(1).

This study has employed the bounds testing (ARDL) approach to co-integration to examine the long run and short run relationships between fiscal deficit and private investment in Sri Lanka.

Table 1: The Result of the F-test for Co-integration

Dependent Variable	AIC and SBC lags	F Statistic	Probability	Outcome
$F_{RIt}(RI_t \backslash BD_t, MS_{2t}, ER_t, \pi^e_t)$	2	5.21**	0.0001	Cointegrated
$F_{BDt}(BD_t \backslash RI_t, MS_{2t}, ER_t, \pi^e_t)$	2	4.99**	0.0001	Cointegrated
$F_{MS2t}(MS_{2t} \backslash BD_t, RI_t, ER_t, \pi^e_t)$	2	2.66	0.0113	Not Cointegrated
$F_{ERt}(ER_t \backslash RI_t, BD_t, MS_{2t}, \pi^e_t)$	2	2.14	0.0374	Not Cointegrated
$F_{\pi^e_t}(\pi^e_t \backslash RI_t, BDt, MS_{2t}, ER_t)$	2	7.26**	0.0000	Cointegrated

Notes: The critical value of F-statistics for lower bound and upper bound are 3.79 and 4.85 respectively, at 5% significance level Sources from Pesaran et al. (2001, p. 300), Table CI(iii) Case III unrestricted intercept and no trend. ** indicates the 5% significant level.

Source: Author's calculations 2011.

Table 2: The Result of the ARDL (2, 0, 0, 0, 0) Long Run Model
Dependent Variable: Real Interest Rate (RIt).

Variable	Coefficient	Standard Error	t-Statistics	Probability
RIt(-1)	0.696083***	0.167684	4.151151	0.0002
RIt(-2)	-0.139204	0.133444	-1.043162	0.3036
BDt	-0.043906**	0.019397	-2.263578	0.0296
MS2t	0.033272	0.089349	-0.372384	0.7117
π_t^e	0.714369**	0.272016	2.626198	0.0125
ERt	0.014465	0.022866	-0.632617	0.5309
Dummy80	12.83956***	4.362787	-2.942973	0.0056
Dummy90	-11.98072***	3.949614	-3.033391	0.0044
C	0.893632	2.243855	0.398257	0.6927

Notes: **, *** represent 5% and 1% significance levels respectively
Source: Author's calculations 2011.

Table 3: ARDL (2, 0, 0, 0, 0) Model ECM Results
Dependent Variable: First Difference of Real Interest Rate (ΔRIt)

Variable	Coefficient	Standard Error	t-Statistic	Probability
ΔRIt(-1)	0.648931	0.577057	1.124553	0.2684
ΔRIt(-2)	-0.182314	0.143416	-1.271222	0.2120
ΔBDt	-0.058492	0.038714	-1.510902	0.1398
ΔMS2t	0.002893	0.133389	0.021691	0.9828
$\Delta \pi_t^e$	1.261315	1.011879	1.246507	0.2209
ΔERt	-0.200649	0.263254	-0.762189	0.4511
ECM(-1)	-0.700254***	0.271596	-2.578291	0.0143
DUMMY80	-12.64847***	4.927007	-2.567171	0.0147
DUMMY90	-12.18474***	4.848766	-2.512958	0.0167
C	0.815245	0.934711	0.872189	0.3890

Notes: ** represent 5% significance level.
Source: Author's calculations 2011

The long run coefficient between RI_t and its determinants of BD_t, π_t^e, MS_t, ER_t are confirmed based on result of bounds testing. Given the existence of long-run relationship, we used the second step of ARDL co-integration method to estimate the long run parameters.

The estimated coefficient of the long-run relationship shows that BD_t has a negative significant impact on RI_t. According to Chakraborty (2006), the higher interest rate reduces (crowds out) private investment. Thus, this result shows the absence of financial crowding out in Sri Lanka, as was expected. The results of short-run dynamic coefficients associated with the long run relationships obtained from ECM equation are approximately 70% of disequilibria from the previous year's shock converge back to the long-run equilibrium in the current year.

Conclusion

According to our empirical results, when the budget deficit increased due to increased government expenditure, the interest rates declined in Sri Lanka. This implies the absence of financial crowding out effects of fiscal expansions. This result contradicts the hypothesis that the higher budget deficit increases the real interest rate and thereby reduces private investment. In Sri Lanka, private investment appears to have increased when the budget deficit increased due to fiscal expansion. The absence of the crowding out effect can be attributed to accommodative monetary expansions. This means that the Central Bank of Sri Lanka has mitigated the crowding out effects of expansionary fiscal policy through accommodative monetary policy. The monetary expansions have been financed by short term capital inflows resulting from financial liberalisation.

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