

Public Debt Solvency: An Analysis of Kerala State Finances

Liji Lakshmanan T

Research Scholar, Department of Economics, University College, Trivandrum, Kerala, India

Abstract: Kerala economy has been experiencing fiscal instability for long and many fiscal adjustment programmes are implemented to correct the issue. Increasing debt and deficits has been a major problem in the State and limitless accumulation of debt may finally end up in debt insolvency. Hence, the paper attempts a test of public debt solvency in Kerala, based on a univariate inter-temporal budget constraint model. The data period covers from 1980-81 to 2016-17. The stationarity tests show that public debt is insolvent in Kerala. If the current policy is pursued continuously, the government may not be able to service its debt in the long run.

Keywords: Fiscal adjustment, Public debt, Solvency, Kerala, Time series, Stationarity

1. INTRODUCTION

Since many decades, Kerala has been following deficits as budgetary policy for the purpose of development. Deficit financing in a huge way, mainly in the form of borrowings, has adversely affected the fiscal discipline of the Government. From 1980 onwards, there has been many fold growth in the debt of the government. Accumulation of debt leads to macroeconomic instability in the country, if it is not utilised for productive income generating activities. Social sector based development pattern of Kerala has incurred high non-plan revenue expenditure, which forms a major cause for deficit in the budget. Hence, the borrowings are mainly taken to finance non-developmental expenditure and this harms the economy. The White Paper of 2001 and 2016, brought out by the Government of Kerala, declare the crisis-like situation in the State finances. Since then, various fiscal adjustment policies like debt swap scheme, FRBM Act etc. have been enacted to get the State finances back on track. Thirteenth Finance Commission had listed out Kerala, Punjab and West Bengal as the fiscally stressed States. The data given in Table 1 and 2 shows the status of fiscal indicators and the targets assigned by the Fourteenth Finance Commission on the State. It is found that debt as a ratio to GSDP has met the limit, but is on an increasing trend. Share of interest payments in the revenue receipts and both fiscal and revenue deficit as a ratio to GSDP have crossed the target level. Also, an increasing trend is seen in deficits recently. Increase in deficits will in turn lead to an increase in borrowings. Limitless accumulation of debt may finally end up in debt insolvency. Solvency of debt refers to the servicing of borrowings without any default. If interest rate grows higher than GSDP growth rate, then deficit financing will lead to explosive growth of debt and resultant insolvency. It is crucial for an economy to remain solvent, as it determines the confidence of the lending institutions on the Government's borrowing ability. Therefore, current fiscal policy should not lead to growth of debt in an explosive manner.

Table 1: Debt and Deficit Indicators of Kerala

Indicators	Accounts				
	2012-13	2013-14	2014-15	2015-16	2016-17
Debt/GSDP (%)	25.12	25.59	25.75	26.75	30.22
Interest Payments/Revenue Receipts (%)	16	17	17	16	16
Fiscal Deficit/GSDP (%)	3.64	3.64	3.54	3.02	4.29
Revenue Deficit/GSDP (%)	2.27	2.43	2.62	1.64	2.51

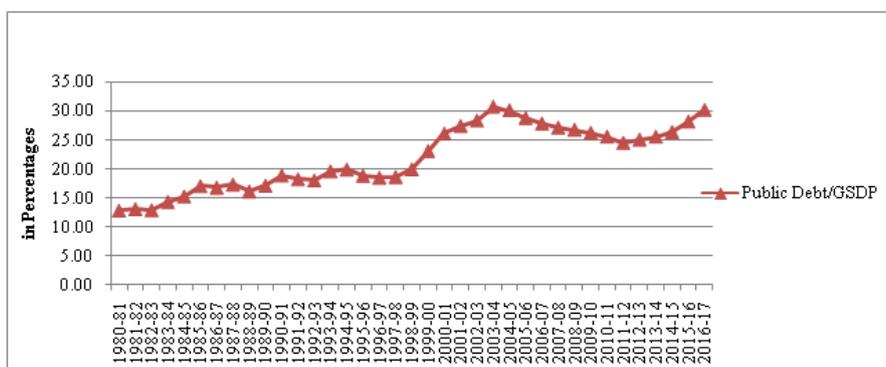
Source: Kerala Budget (2018)

Table 2: Fiscal Targets recommended by 14th Finance Commission

Indicators	14 th Finance Commission Targets (%)				
	2015-16	2016-17	2017-18	2018-19	2019-20
Debt/GSDP (%)	31.34	30.84	30.40	30.01	29.67
Interest Payments/Revenue Receipts (%)	15.70	15.01	14.37	13.78	13.23
Fiscal Deficit/GSDP (%)	3	3	3	3	3
Revenue Deficit/GSDP (%)	0	0	0	0	0

Source: Kerala Budget (2018)

As per the budget calculations, public debt includes borrowings from internal sources, loans and advances from the Central Government and provident funds, small savings etc. It does not include non-interest bearing other obligations. Internal sources of debt include open market borrowings, special securities issued to national small savings fund, borrowings from banks and financial institutions, bonds and debentures issued by the State Government and ways and means advances from RBI. The trend of Kerala's public debt as a ratio to GSDP from 1980-81 to 2016-17 is depicted in Chart 1. A secular increase is exhibited by the debt variable till 1998-99 and then a steep increase is seen till 2003-04. Afterwards, a sharp decline is found, only to increase again from 2011-12.



Source: RBI and Kerala Budget

Chart 1: Trends in Public Debt as a ratio to GSDP in Kerala

The composition of public debt during the last five years is given in Table 3. The State Government mainly depends on market borrowings and then on provident funds and small savings etc. for financing its deficit. Compared to other debt items, both of them are low cost borrowings. But the growth rate of debt from provident funds, small savings etc. is much faster than that from market loans. Provident funds, small savings etc. is a part of the public account and excessive dependence on public account for borrowings is not advisable.

Table 3: Composition of Public Debt (as at end-March) (in Rs. Crores)

Sl. No.	Item	2001	2013	2014	2015	2016	2017
	Total Debt	24434	103561	119009	135440	157370	186453
1.	Internal Debt	7571	65628	76804	89068	102496	118268
i)	Market Borrowings	4500	48810	60183	71960	84846	99532
ii)	Special Securities issued to National Small Savings Fund	1012	11323	11281	11806	12537	13509
iii)	Borrowings from Banks and Financial Institutions	1474	5496	5340	5302	5113	5228
iv)	Ways and Means Advances from RBI	585	-	-	-	-	-
2.	Loans and Advances from the Centre	6673	6622	6662	7065	7235	7614
3.	Provident Funds, Small Savings etc.	10190	31311	35543	39307	47639	60571

Source: RBI and Kerala Budget

Considering the increasing trend of public debt and deficits in Kerala, the present paper tests the solvency of public debt using a univariate approach of inter-temporal budget constraint model.

2. DATA AND METHODOLOGY

A time series data for a period 1980-81 to 2016-17, collected from "Handbook of Statistics on State Finances" published by the Reserve Bank of India and "Kerala Budget" published by Government of Kerala, is used to check the solvency of public debt. Summary statistics of the data used for analysis is provided in Table 4.

Table 4: Summary Statistics

Variable	Observations	Mean	Std. Dev.	Maximum	Minimum
Public Debt/GSDP	37	21.9931	5.5337	30.7541	12.9322

Notes: Data covers for a period from 1980-81 to 2016-17; GSDP at current prices (2011-12 series).

Solvency of public debt is assessed in the paper using univariate approach of inter-temporal budget constraint model. Univariate approach of inter-temporal budget constraint model is applied in the literature by Hamilton and Flavin (1986), Wilcox (1989), Buiters and Patel (1992), Baglioni and Cherubini (1993), Rajaraman and Mukhopadhyay (2000), Uctum et al. (2006) and Afonso and Jalles (2014). The budget constraint for a Government, assuming no ponzi financing, is:

$$b_t = g_t - r_t + \frac{(1 + i_t)}{(1 + \delta_t)} b_{t-1}$$

where b_t is outstanding public debt as a ratio to GSDP, g_t is public expenditure minus interest payments as a ratio to GSDP, r_t is public revenue as a ratio to GSDP, $g_t - r_t$ is primary deficit as a ratio to GSDP, i_t is interest rate on past debt and δ_t is growth rate of GSDP.

For a fiscal policy to be sustainable, present value of the outstanding debt calculated for $t+n$ periods would become zero as n approaches infinity in the limit. That is, if $\lim_{n \rightarrow \infty} \prod_{k=1}^n (1 + i_{t+k})^{-1} b_{t+n} = 0$, then $b_t = \sum_{j=1}^n \prod_{k=1}^j (1 + i_{t+k})^{-1} (r_{t+j} - g_{t+j})$. The limit equation shows the debt solvency condition and the next equation shows the fiscal sustainability. To check if the solvency condition is satisfied, an econometric exercise is carried out assuming that debt follows an ARIMA process. Following Wilcox (1989), the equation for univariate approach is given as: $b_t = \alpha_0 + \alpha_1 t + \sum_{i=1}^{\infty} \beta_i b_{t-i} + e_t$. This equation corresponds to the stationarity test with intercept and trend, where α_0 is intercept, t is trend and e_t is independent random error with zero mean and constant variance. Hence, the paper employs Augmented Dickey-Fuller (ADF) (1981) and Phillips-Perron (PP) (1988) unit root tests to examine whether the debt series follows a stochastic unit root process. ADF test takes into account serial correlation in error terms by using lagged differences of the series, while PP test does it by using non-parametric statistical methods. In both the tests, the null hypothesis of unit root is tested against the alternative of trend stationarity. If the null hypothesis is rejected or the series is trend stationary, then the public debt is solvent and vice versa. As the choice of one discount rate is difficult, undiscounted series of debt as a ratio to GSDP is used in the analysis.

3. RESULTS

The results of the unit root tests- ADF and PP- are reported in Table 5 and Table 6 respectively. The test statistics are found to be insignificant at 5 percent level of significance and therefore, the null of unit root cannot be rejected. This implies that the public debt series is non-stationary and hence, the solvency condition of debt does not exist in Kerala State finances.

Table 5: Unit Root Test- ADF Test

Variable	At level	
	With trend and intercept	
	t-statistic	Lag
Public Debt/GSDP	-3.0128	3
Critical Value at 5 %	-3.5530	

Notes: Lag length is chosen using SBIC criterion.

Table 6: Unit Root Test- PP Test

Variable	At level	
	With trend and intercept	
	t-statistic	Bandwidth
Public Debt/GSDP	-1.9642	3
Critical Value at 5 %	-3.5403	

Notes: Bandwidth is selected using Newey West.

4. CONCLUSION

The paper tries to test the solvency of public debt in Kerala using a univariate approach of inter-temporal budget constraint model, for a period from 1980-81 to 2016-17. In econometric terms, public debt is solvent, if the series is

stationary. ADF and PP tests are applied to public debt as a ratio to GSDP in order to find out the stationarity of the series. The results clearly indicate the presence of unit root or the non-stationarity of public debt and thus, it is concluded that the public debt of Kerala is insolvent. Even after the implementation of fiscal adjustment programmes, public debt solvency is not achieved. Hence, a more prudent fiscal policy is required to avoid the risk of debt solvency in the long run.

REFERENCES

- [1] Afonso, A., & Jalles, J. T. (2014). A Longer-run Perspective on Fiscal Sustainability. *Empirica*, 41(4), 821-847.
- [2] Alwin, J. (2014). Trends, Pattern and Issues of Sustainability of Public Debt of Kerala. *ISDA Journal*, 24(2), 143-163.
- [3] Baglioni, A., & Cherubini, U. (1993). Intertemporal Budget Constraint and Public Debt Sustainability: The Case of Italy. *Applied Economics*, 25(2), 275-283.
- [4] Buitier, W. H., & Patel, U. R. (1992). Debt, Deficits, and Inflation: An Application to the Public Finances of India. *Journal of Public Economics*, 47(2), 171-205.
- [5] Deyshappriya, N. R. (2012). Debt and Fiscal Sustainability in Sri Lanka. *International Journal of Scientific and Research Publications*, 2(3), 1-8.
- [6] Dickey, D. A., & Fuller, W. A. (1981). Likelihood Ratio Statistics for Autoregressive Time Series with a Unit Root. *Econometrica: Journal of the Econometric Society*, 1057-1072.
- [7] George, K. K., & Krishnakumar, K. K. (2012). *Trends in Kerala State Finances-1991-92 to 2012-13: A Study in the Backdrop of Economic Reforms in India*. Centre for Socio-Economic & Environmental Studies.
- [8] Government of Kerala. *Kerala Budget (Various Years)*. Thiruvananthapuram: Finance Department.
- [9] Hamilton, J. D., & Flavin, M. (1985). On the Limitations of Government Borrowing: A Framework for Empirical Testing. *American Economic Review*, 76(4), 808-819.
- [10] Phillips, P. C., & Perron, P. (1988). Testing for a Unit Root in Time Series Regression. *Biometrika*, 75(2), 335-346.
- [11] Prakash, B. A. (2017, Feb.). *Kerala's Acute Fiscal Crisis*. Paper presented at the Indian Institute of Management at Kozhikode. Retrieved from <http://keralaeconomy.com>
- [12] Rajaraman, I., & Mukhopadhyay, A. (2000). *Sustainability of Public Domestic Debt in India* (Working Paper). National Institute of Public Finance and Policy.
- [13] Reserve Bank of India (2017). *Handbook of Statistics on Indian States*. Mumbai: Reserve Bank of India.
- [14] Sen, T. K. (2012). *Recent Developments in Kerala State Finances*. (No. 449), Centre for Development Studies.
- [15] Uctum, M., Thurston, T., & Uctum, R. (2006). Public Debt, the Unit Root Hypothesis and Structural Breaks: A Multi-Country Analysis. *Economica*, 73(289), 129-156.
- [16] Wilcox, D. W. (1989). The Sustainability of Government Deficits: Implications of the Present-value Borrowing Constraint. *Journal of Money, credit and Banking*, 21(3), 291-306.

AUTHOR'S BIOGRAPHY



I started doing Ph.D. as a full time scholar at University College, Trivandrum from June, 2015 onwards. I have cleared UGC-NET exam for lectureship. I have completed M.A. in Econometrics from University of Madras and B.A. in Economics from University of Calicut.