Government spending and revenue in Kerala: Is to convergence path?

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ABSTRACT

Examining the empirical relationship between government revenue and expenditure is imperative to understand whether current policies are optimal, or whether it is desirable to maintain these policies, otherwise to take appropriate measures. This would be helpful, for instance, in formulating and assessing budgetary policies and economy's behavior. This Paper attempts to investigate the causal link between public spending and public revenue in terms of empirical hypotheses in a sub national state, Kerala by employing the annual data for the period 1991-92 to 2012-13. The results from tests of co integration and causality infer that the expenditure and revenue decisions may be institutionally uncoupled for this period.

1. Introduction

The divergence between government expenditure and revenue result in a persistent and seemingly unsustainable gap in resources. Fiscal consolidation can eventually happen either through increase in revenue or decrease in expenditure or balancing both of them. Likewise, if the decision to raise revenues and increased expenditure decisions is taken simultaneously then it would have an ambiguous impact on deficits. The consequent fiscal stress makes financial management an increasingly difficult task. In this regard fiscal consolidation strategy needs an evaluation of initial level of taxes and expenditures with the temporal relationship existing between them. The basis for analysis of fiscal sustainability is through understanding the path for public expenditure and revenue. The paper tries to study the causal

link between government expenditures and revenues for Kerala, a southern state of India on the basis of theoretical propositions.

2. Fiscal scene of Kerala

The period under the present study is characterized by a remarkable turnaround in both the national and state's economy. The finances of the state during the two decades of our study have been influenced by 5 Union Finance Commissions (9th to 13th), all of which basically subscribed to the agenda of fiscal conservatism of the Union Government. Despite making several attempts at fiscal consolidation, the improvements attained in key deficit indicators during the period 2002-03 to 2010-11 could not be sustained in 2011-12 and 2012-13 due to various external and domestic compulsions. The Thirteenth Finance Commission treated Kerala, along with Punjab and West Bengal, as a debt stressed state, setting targets for Revenue Deficit, Fiscal Deficit and debt as a proportion of GSDP (Economic Review of Kerala, 2013). In absolute term, public spending and tax revenue show rough changes but at the same time as percentage of GSDP is more or less constant within a range (Figures.1and 2). Trend in GSDP in Kerala has been noticed since FY 2003-04 with a record rise to 10.08 percent in the growth rate of GSDP at constant prices in FY 2005-06. Between the years 2002-03 to 2012-13 the annual average growth rate in GSDP was around 7.6 percent. In other seen, The Domar Gap is increasing partly due to high growth rate of GSDP and partly due to interest rate relief on Central loans, debt swaps of earlier high cost market loans and decline in the market rates, but in the last three years it showed as declining. It implies public spending and revenue increases as increase in the state income, yet it inconclusive with regard to which hypothesis actually fit into Kerala economy. This paper tries to examine it on the basis of cointegration and causality tests.

Figure.1 growth rate of RR and RE
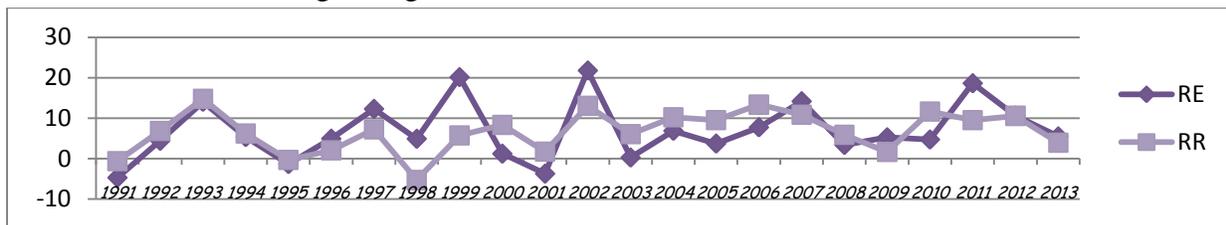
Note: RR=Revenue Receipts, RE=Revenue Expenditure

Figure.2 .TE, DE, SR and TR in terms of GSDP
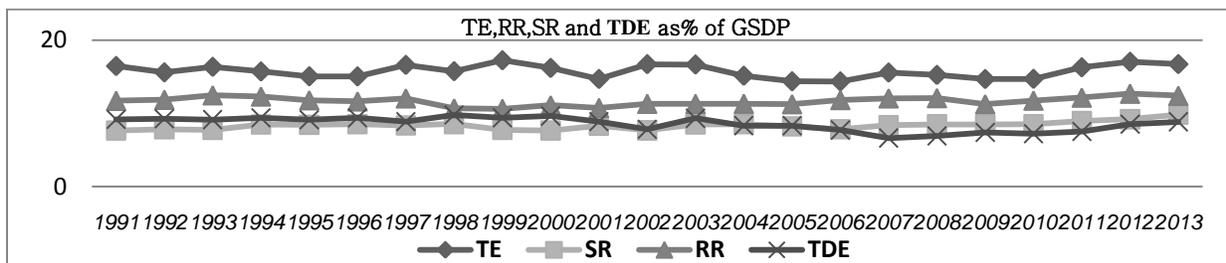
Note: TE=Total Expenditure, DE=Developmental Expenditure, SR=State Revenue, TR=Total Revenue and GSDP=Gross State Domestic Product

3. Theoretical Background

Theoretically observed four different propositions regarding the revenue-expenditure relationship are;

- ▪ *Tax-and-spend hypothesis* (Friedman, Buchanan and Wagner, 1978) advocates that raising revenue leads to more expenditure (Al-Qudair 2006; Obioma& Ozunghalu 2010]..
- ▪ *Spend-and-tax hypothesis (*Peacock and Wiseman (1961; 1979), advocate that the expenditure causes to revenue, suggesting that temporary increase in government expenditures in response to such crises will lead to higher permanent taxes. That is, higher expenditures would lead to higher taxes.
- ▪ *Institutional Separation Hypothesis* (Baghestani and McNown (1994) suggests that revenues and expenditures are independent of one another that, decisions on taxation are taken independently from the allocation of government expenditure, which argues that the government decides separately about spending and revenues, so there is no long-run relationship between government spending and revenues. Accordingly the fiscal policy is unsustainable
- ▪ *Fiscal synchronization* hypothesis (Meltzer and Richard, 1981; Musgrave, 1966) argues that governments may concurrently change expenditure and taxes. Government revenue decisions are not made in isolation from government expenditure decisions but the decisions are made concurrently.

4. Empirical Evidences

From an empirical perspective, there have been a plethora of studies on this nexus, some of the studies supports tax and spend hypothesis (Ram, 1988; Bohn, 1991; Mounts and Sowell, 1997; and Chang, Liu and Caudill (2002). On the other hand, Anderson, Wallace and Warner (1986), and Jones & Joulfaian (1991) argued in favor of spend and tax hypothesis. Supporting Fiscal synchronization hypothesis was found by Manage and Marlow (1986), Miller and Russek (1989), and Owoye (1995). Whereas, Hoover & Sheffrin (1992), Baghestani and McNown (1994) have found evidence in favour of institutional separation hypothesis. Studies from India also show different results, Dhanasekaran (2001) found evidence for spend and tax by using the granger causality test. Vadlamannati and Veni (2007) establish a causal relationship from revenue to expenditure for Andhra Pradesh. Recently Nithin (2012) tested these empirical hypotheses in Indian states categorizing into 4 different groups, under this Kerala included in fiscally stressed states (FSS), which shown as underperformed on the tax effort which had led to an over run on the borrowing front and accumulation of debt stock to fund the expenditure which in turn led to a spiral wherein these states spend a lot of their resources on interest payments on past debt leading to institutional separation between revenue and expenditure. On other hand, Chaudhuri and Sengupta (2009) suppose in their study, fiscal synchronization seems to be the mode in Kerala and Andhra Pradesh, in Karnataka revenues lead to expenditure, where for Tamil Nadu, the data failed to show any evidence of causality. This study focus on Kerala state not only the relationship between total expenditure and total revenue, but different pairs of expenditures and revenues have also admitted to make the results of the experiment more reliable and exhaustive.

5. Empirical Analysis

Examining the empirical relationship between government revenue and expenditure is imperative in understanding the behavior of public finance and future path of the budget. This would be helpful, for instance, in formulating and assessing budgetary policies and economy's behavior. Fiscal sustainability questions whether current policies are consistent with the intertemporal budget constraint. The idea behind carrying out cointegration analysis is to examine whether the state has maintained the inter-temporal budget constraint during the period of study. Co integration implies that there exists an error correction mechanism pushing government finances towards the levels required by the intertemporal budget constraint. Lack of co integration among the variables implies that under unchanged fiscal policies, the debt stock of the state government is unsustainable. Since government expenditure and revenues are not stationary, an attempt has been made to test, whether there exists a long-run equilibrium between them through Engle granger test with the assumption that the error correction mechanism would push government finances towards the levels required by the inter-temporal budget constraint and ensure fiscal and debt sustainability in the long-term. For this, Data have been collected from different government sources, Budget reports, Budget in brief, Department of Economic and statistics, Economic review, of Kerala. All these variables are taken in real term using deflator. The testable functions and representation is as follows;

$\Delta \ln Y_t = \alpha_1 + \beta_1 \Delta \ln X_t + \lambda_1 EC_{t-1} + u_{t1}$ (1)

$\Delta \ln X_t = \alpha_1 + \beta_1 \Delta \ln Y_t + \lambda_1 EC_{t-1} + u_{t1}$ (2)

Here Δ is the first difference operator; the t-significance of the one period lagged error-correction term ECT_{t-1} represents convergence of the model toward long run adjustment if its sign is negative. While checking cointegration between expenditures and revenues, we do not obtain evidence in favor of co integration using data from Kerala (Table.1). Where, L denotes the natural logarithm, TE=Total Expenditure, SR= State Own Revenue (Tax and Non Tax), TTR=Total Revenue from Tax and Duties, TR=Total Revenue. RE=Revenue Expenditure, RR=Revenue Receipts.

Table.1.   Results from E-G test

Regressors	Coefficient	Std. Error	t-ratio	p-value	
	1-DEPENDENT VARIABLE: D_LRE				
CONST	0.0206472	0.0219826	0.9393	0.36004	
D_LTSR	0.724448	0.250491	2.8921	0.00971	***
ECT	-0.286974	0.172847	-1.6603	0.11418	
	2-DEPENDENT VARIABLE: D_LSR				
CONST	0.0393595	.0164420	2.394	0.0278	**
D_LTRE	0.502311	0.169516	2.963	0.0083	***
ECT	-0.209411	0.149039	-1.405	0.1770	
	3-DEPENDENT VARIABLE: D_LTR				
CONST	0.0599447	0.0148329	4.0413	0.00077	***
D_LTDE	0.264886	0.154286	1.7168	0.10317	
TRTDE_1	-0.0395615	0.128537	-0.3078	0.76178	
	4-DEPENDENT VARIABLE: D_LTR				

CONST	0.0400228	0.0135729	2.9487	0.00859	***
D_LTE	0.554716	0.149021	3.7224	0.00156	***
ECT	**-0.31003**	**0.180014**	**-1.7223**	**0.10216**	

<div align="center">5-DEPENDENT VARIABLE: D_LTE</div>

CONST	0.00440414	0.0197833	0.2226	0.82634	
D_LTR	0.797633	0.21242	3.7550	0.00145	***
ECT	0.628586	0.223821	2.8084	0.01162	**

<div align="center">6-DEPENDENT VARIABLE: L_RR</div>

CONST	0.354587	0.393379	0.9014	0.37929	
LTRE	0.950297	0.040797	23.2933	<0.00001	***
ECT	0.593789	0.191218	3.1053	0.00611	***

<div align="center">7- DEPENDENT VARIABLE: LRE</div>

CONST	0.176013	0.401246	0.4387	0.66612	
L_RR	0.994657	0.0421511	23.5974	<0.00001	***
ECT	0.576878	0.192934	2.9900	0.00785	***

Note: 6th, 7th and 5th models are statistically significant but sign is not negative, while 1st, 2nd, 3rd and 4th models are not statistically significant**,** at * - 10%, ** - 5%, *** - 1%.

Therefore, here conduct the Granger causality test after taking the first-difference of the data. The test result is reported in Table.2. Granger Causality framework is used to examine the dependency between these six pairs of fiscal variables. The test uses to analyse the effect of one time series on another one. That is, a variable is said to Granger cause another variable if past and present values of a variable help to predict another variable. To test whether expenditure Granger causes revenue, or revenue Granger causes expenditure, here carried out bivariate causality test on the following pairs of fiscal variables. The testable function is specified as follows;

$$\Delta \ln Y_t = \alpha + \sum_{i=1}^{P} \beta \ \Delta Y_{t-i} + \sum_{i=1}^{P} \phi \ \Delta X_{t-i} + \in_{1t} \quad (3)$$

$$\Delta \ln X_t = \alpha + \sum_{i=1}^{P} \beta \ \Delta X_{t-i} + \sum_{i=1}^{P} \phi \ \Delta Y_{t-i} + \in_{1t} \quad (4)$$

Pair1: Total Revenue Expenditure (TRE) & Total Revenue Receipts (TRR)
Pair 2: Total Development Expenditure (TDE) & Total Tax Receipts (TTR)
Pair 3: Total Expenditure (TE) & Total Revenue (TR)
Pair 4: Total Revenue Expenditure (TRE) &Total State own Revenue (TSR)
Pair 5: Capital Outlay (CPLY) & Total State Own Revenue (TSR)
Pair 6: Capital Outlay (CPLY) & Total Tax Receipts (TTR)

Table.2.Pair Wise Granger Causality Test Results

Null hypothesis	F-statistics	P-value
Pair-1		
TRE does not Granger Cause TRR	*1.10637*	*0.3580*
TRR does not Granger Cause TRE	*0.13077*	*0.8785*
Pair-2		
TDE does not Granger Cause TTR	*0.34238*	*0.7159*
TTR does not Granger Cause TDE	*1.02184*	*0.3853*
Pair-3		

TE does not Granger Cause TR	*0.01574*	*0.9844*
TR does not Granger Cause TE	*0.1342*	*0.7938*
Pair-4		
TRE does not Granger Cause TSR	*1.73951*	*0.2115*
TSR does not Granger Cause TRE	*1.14586*	*0.3460*
Pair-5		
CPLY does not Granger Cause TSR	*0.33203*	*0.7230*
TSR does not Granger Cause CPLY	*0.37162*	*0.6962*
Pair-6		
CPLY does not Granger Cause TTR	*0.91678*	*0.4225*
TRE does not Granger Cause CPLY	*2.09755*	*0.1597*

Note; p-value shows level of significance at -5%.

Since the causality between total revenue receipt (states own) and revenue expenditure could not be established, further investigation carried on different pairs as shown in table.2. Even though, cannot find any evidence for the Granger causality and infer that expenditure and revenue decisions may be institutionally uncoupled, which argues that the government decides separately about spending and revenues for this period.

6. Conclusion

The purpose of this analysis is to find out the feedback effect between expenditure and revenue of Kerala by employing the annual data for the period 1991-92 to 2012-13.In examining the existence of a causal relationship between state government revenues and expenditure data, we do not find evidence for causality and infer that expenditure and revenue decisions may be institutionally uncoupled. This indicates the need to curb non developmental revenue expenditure growth and to boost the growth of GSDP of the state and to take effective measures to improve the tax administration so that tax evasion tendency may be checked and other malpractices may be avoided. It is also signifying that the result may be because of less time period under consideration or influence of other factors from a political economy point of view, that it is widely arguing that Public expenditure is determined by political will of the leading forces in a state, their priorities, their desired state model, and their interpretation of current economic and political phase (Buchanan and Wagner, 1977; Persson and Tabellini, 1994; Rogoff, 1990; Rogoff and Sibert, 1988; Sasmal, 2004; Marjit and Maity, 2006). Further investigation is required on such matters, that whether there exist such effects on fiscal matters of the state and also increasing time period under consideration.

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