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Debt Sustainability of States in India: An Assessment

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Abstract: The debt position of the state governments in India, which deteriorated sharply between 1997-1998 and 2003-2004, has witnessed significant improvement since 2004-2005. Debt sustainability analysis based on empirical estimation of inter-temporal budget constraint and fiscal policy response function in a panel data framework, covering 20 Indian states for the period 1980-1981 to 2015-2016, indicates that the debt position at the state level is sustainable in the long run. The increase in contingent liabilities of states and take-over of large chunk of these liabilities through debt restructuring of State Power Distribution Companies, however, would adversely affect the debt position of states.

Key words: gross fiscal deficit; public debt; state governments
JEL codes: H62, H63, H70

1. Introduction

In line with an overall decentralizing trend, the sub-national governments worldwide have been entrusted with increasing responsibilities towards delivery of public goods and services, and investment in physical and social infrastructure. As the concomitant expenditure requirements generally fall short of own revenue receipts and inter-governmental transfers from the national authorities, the sub-national governments have to depend on borrowed resources to finance such expenditure. However, the borrowing limits of sub-national governments in various countries are subject to either regulatory restrictions or self-imposed fiscal discipline, given the underlying requirement to ensure debt sustainability at the sub-national level.

In India, the state governments have been playing an important role in discharging various functions assigned to them under the Constitution. As the non-debt receipts of states are often not sufficient to provide the requisite financial resources, they resort to borrowings to meet various development needs. It is often said that borrowing *per se* is not bad provided it is used for productive purposes. While this may be a desirable goal, the actual utilization of borrowed resources may not necessarily be only for productive purposes due to various reasons. However, the accumulation of debt liabilities, if left uncontrolled, could cause macroeconomic and financial stability issues.

The evolution of debt position of state governments in India has seen several phases: a comfortable position prior to 1997-1998 to a phase of sharp deterioration and fiscal stress during 1997-1998 to 2003-2004 and then to a phase of significant improvement since 2004-2005. While the debt liabilities of states increased sharply during 1997-1998 to 2003-2004, the subsequent period has been a phase of consolidation, attributable, among others, to

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the implementation of fiscal rules through the enactment of Fiscal Responsibility and Budget Management (FRBM) Acts/Fiscal Responsibility Legislations (FRLs) at the state level in early 2000s. These fiscal consolidation initiatives were complemented by debt and interest relief measures of the Central government, and also supported by a favourable macroeconomic environment following the high growth phase and a reversal of the interest rate cycle in the mid-2000s. Majority of the states adhered to the debt targets set for them by the Thirteenth Finance Commission (FC-XIII) for the period 2010-2014, even as some of them breached their respective debt targets and continued to have unsustainable debt positions. In the recent period, the signs of fiscal stress have re-emerged on the back of poor performance of state public sector enterprises. With several states assuming additional debt liabilities as part of financial and operational restructuring of state power distribution companies, there is an inherent risk in terms of debt servicing capacity and soundness of fiscal performance parameters of states.

It is against the above backdrop that this paper assesses the issue of debt sustainability of states in India. The debt-sustainability analysis carried out in this paper is based on three approaches: indicator-based analysis, estimation of both inter-temporal budget constraint and fiscal policy response function (to deterioration in debt position) at the state level. While the debt sustainability analysis *per se* is in respect of debt stock or outstanding liabilities of the state governments, this has been extended to highlight the fiscal implications of off-budget items, *viz.,* contingent liabilities of states, guarantees extended by them to state power utilities and finally the take-over of debt liabilities of these utilities by the state governments that have decided to participate in the restructuring scheme implemented by the Central government.

The paper is organised as follows. Section II defines debt sustainability. Section III presents a brief overview of various studies that have examined debt sustainability at the state level in the Indian context. An analytical presentation of the theoretical basis underlying fiscal/debt sustainability analysis is provided in Section IV. Some stylised facts relating to the evolution of state government debt in India are presented in Section V. Section VI presents an empirical assessment of debt sustainability at the state level based on different approaches. The rationale for extending the conventional debt sustainability analysis to include off-budget fiscal position of states in the context of additional debt liabilities which have arisen on account of take-over of debt of state power utilities is explained in Section VII. The concluding observations are covered in Section VIII.

2. Defining Debt Sustainability

Sustainability is a term that has been used with increasing frequency in the academic literature and multilateral policy discussions, but with different connotations under different circumstances (Balassone & Franco, 2000; Chalk & Hemming, 2000). How one defines debt sustainability could affect the conclusion one arrives about the sustainability or otherwise of debt in an economy. In the pioneering work on debt sustainability, based on the post-Second World War US data, Domar (1944) pointed out that primary deficit path can be sustained as long as real growth of the economy remains higher than the real interest rate. Buiter (1985) suggested that sustainable fiscal policy is one that is capable of keeping the public sector net worth to output ratio at its current level. Blanchard (1990) provided two conditions for sustainability *viz.*, a) the ratio of debt to GNP should eventually converge back to its initial level, and b) the present discounted value of the ratio of primary surpluses to GNP should be equal to the current level of debt to GNP. Buiter (1985), Blanchard (1990), and Blanchard and others (1990) considered debt level as sustainable if a country's debt to GDP ratio remains stable, and if the economy

generates debt stabilising primary balance to cover that debt in future.

In terms of the standard definition of fiscal sustainability, the ratio of outstanding debt and debt servicing to GDP, in a steady state, should not increase over time (World Bank and IMF, 2010). The focus in this approach is on stabilizing the debt-to-GDP ratio. IMF (2011) considers a set of fiscal policies as sustainable in case a borrower is able to continue servicing its debt without an unrealistic large future correction to its income and expenditure.

Typically, conventional debt sustainability analysis is an accounting-based approach linked to the *inter-temporal budget constraint* as follows:

$$B_{t+1} = (1+r)\ B_t - PS_t, \quad (1)$$

which states that public debt at the beginning of the period t+1, i.e., (B_{t+1}) equals past period debt including interest payments but adjusted for primary balance, depending on whether there is primary surplus or deficit. Recursively solving (1) with time period (t) starting at 0 and extending up to infinity, we get

$$B_0 = \underset{t\to\infty}{Lim}\sum_{1}^{t} PS_t/(1+r)^t + \underset{t\to\infty}{Lim}\sum_{1}^{t} B_t/(1+r)^t \quad (2)$$

Fiscal policy is said to be sustainable, if the initial stock of debt is equal to the sum of present discounted value of primary surpluses. Alternatively, the present value of revenues must be equal to the present value of spending including interest on the public debt *plus* repayment of the debt itself. This is defined as the *inter-temporal budget constraint* and is satisfied if the discounted sum of end-period debt converges to zero, i.e., *Lim* $b_t/(1+r)^t$ becomes 0. This transversality condition rules out a "Ponzi" scheme and requires that debt should not grow at a rate faster than interest rate. The solvency condition for government debt implies that future budget surpluses would be sufficient to meet current debt liabilities.

The transversality condition relating to the long-term solvency of public debt, when expressed in terms of GDP ratio, states that the GDP growth rate has to be lower than the interest rate so that the discounted terminal period debt ratio converges to zero. This implies that in case of a positive initial public debt, the sum of the cumulated discounted future public surpluses should exceed the sum of the cumulated discounted future public deficits. However, if the rate of growth of GDP is higher than the interest rate, there would be reverse stabilising effect on the ratio of debt to GDP even if a sub-national government is accumulating primary deficit. However, it may not be possible to sustain high growth situation and/or maintain the positive growth-interest differential for all times to come; and a positive primary balance may become necessary to ensure sustainability of public debt and avoid Ponzi scheme.

3. Review of Literature

In the theoretical literature, the rationale for maintaining low/sustainable level of debt is attributed, among others, to the need to ensure sustainability of fiscal policy, provide fiscal space for undertaking counter-cyclical policy, absorbing contingent liabilities without threatening debt sustainability, reduce vulnerability to crises and optimize growth by reducing the risk of crowding out of private investment, while taking into account concerns relating to inter-generational equity and future spending needs. In the Indian context, there are several empirical studies, which have examined fiscal/debt sustainability of states (Table 1).

Table 1 Review of Literature — Empirical Studies on Fiscal/Debt Sustainability in India

Author of the Study	Time period covered	Issue covered	Results of the Study
1	2	3	4
Dasgupta et al. (2012)	2003-2012	Debt sustainability of six state governments	Reduction in debt-GSDP ratios of all the states during 2003-2012, reflecting their adherence to FRBM Acts.
Makin and Arora (2012)	1990-1991 to 2009-2010	Fiscal sustainability at the state level	While majority of the states have stabilized public debt levels as a proportion of GSDP, the slowdown in economic growth could expose many Indian states to considerable fiscal risk.
Misra and Khundrakpam (2009)	1991-1992 to 2007-08	Debt sustainability of state governments	The liabilities of state governments, based on the Present Value of Budget Constraint, were found to be unsustainable.
Nayak and Rath (2009)	1991-2009	Debt sustainability of special category states	The Domar's sustainability condition, i.e., real growth should be higher than the real interest rate was achieved in all the states except Arunachal Pradesh, while the solvency condition was satisfied only in the case of Assam.
Rajaraman et al. (2005)	1992-2003	Debt sustainability at state level	Sharp rise in debt of major states during the quinquennium 1997-2002 over the average for the quinquennium 1992-1997. The interest rate on state debt exceeded the nominal growth rate of GSDP during 1997-2002. There is a need for fiscal correction measures and institutional reforms to stabilize debt as a per cent of GSDP
Goyal, Khundrakpam and Ray (2004)	1951 to 2000	Debt sustainability of the centre, states and general government	After addressing the issue of regime shift, while fiscal stance of the central and state governments at the individual level were found to be unsustainable, it was weakly sustainable for the combined finances of centre and states.
Dholakia et al. (2004)	1988-1989 to 2003-2004	Debt sustainability of states	Based on a uniform target of debt to GSDP ratio of 35 percent, it was observed that there was a debt problem of credit magnitude only in about half of the 25 states covered in the study.
Buiter and Patel (1992)	1971-1989	Debt sustainability of centre, states and public sector undertakings (PSU)	Indian public debt was found unsustainable after discounting by various alternative measures of interest rates as all the discounted debt series turned out to be non-stationary.

Overall, the empirical studies on debt sustainability at the state level in India indicate a mixed picture. While some of the studies point out that the debt position of states is unsustainable, others have drawn attention to the declining debt-GSDP ratios at the state level and attributed this improvement to the strong growth performance and the implementation of fiscal rules during 2003-2012. It is held that a slowdown in growth momentum could pose risk to the achievement of envisaged gross fiscal deficit and debt-GSDP targets under the medium-term scenario.

4. Need for Assessment of Debt Sustainability at the State Level

Globally, sub-national governments (SNGs) have assumed importance in the wake of their increasing role in provision of various essential services while also catering to urban infrastructure requirements. In this process, their resource base has also expanded with growing dependence on borrowed funds. However, the borrowing limits of SNGs are, by and large, regulated by the upper tiers of government in countries with a federal system. In countries with "golden rules" in place, borrowings are required to be authorised, and in some countries (France, Ireland and the UK), the Central government could directly restrict borrowings by lower levels of government. In Sweden, it is mandatory for SNGs to balance their budgets by year-end; in case of deficits, balance has to be restored in two years. Apart from the imposition of restrictions on borrowing limits, the practice of having explicit

co-ordination agreements between different government tiers have also been observed.

In the Indian context, the starting point of the debt sustainability exercise is to examine whether the state governments really face hard budget constraint? Article 293 of the Indian Constitution stipulates that a state may not without the consent of the Government of India raise any loan if there is still outstanding any part of a loan which has been made to the state by the Government of India or by its predecessor Government, or in respect of which a guarantee has been given by the Government of India or by its predecessor Government. This implies that the state governments do not have unrestricted power to borrow as long as they are indebted to the Centre. In addition, states are also prohibited from borrowing abroad with the exception of loans from multilateral financial institutions intermediated by the Central government.

In addition to the restrictions under Article 293 of the Constitution of India, the state governments have gone ahead with the self-imposed restrictions through the enactment of FRBM Acts/FRLs. The implementation of a rule-based fiscal discipline mechanism under these enactments since the early 2000s has been marked by a gradual move towards sustainability of their fiscal and debt positions, with majority of the states achieving the FC-XIII targets as also their self-imposed targets. However, a few states continue to face fiscal stress and their debt positions remain an area of concern. Furthermore, notwithstanding strict monitoring of overall borrowing limits and adherence to various restrictions, the state governments have been able to raise additional "off-budget" borrowings with guarantees through state-controlled Special Purpose Vehicles (SPVs) and/or state-owned public sector enterprises (SPSEs), which have in-built risks of various kinds. It is against this backdrop that the following Section presents the evolution of debt position of state governments beginning 1980-1981.

5. Evolution of State Government Debt in India: Some Stylized Facts

The fiscal position of states in India, which had remained comfortable in the first three decades since independence, exhibited signs of fiscal stress since the mid-1980s. The average debt-GDP ratio inched up slightly from 18.3 percent during the 1980s to 20.8 percent during the 1990s. The period from 1997-1998 to 2003-2004 was, however, marked by a sharp deterioration in key fiscal indicators of states, which was reflected in an increase of around 6 percentage points in average debt-GDP ratio to 26.8 percent and further to a high of 31.8 percent in end-March 2004 (Figure 1a).

In recognition of the need for fiscal discipline, the state governments, however, adopted a rule-based fiscal framework through the enactment of FRBM Acts/FRLs which also included stipulation of ceilings on total liabilities and in some cases on debt-service liabilities **(**Goa, Jharkhand and Odisha). Karnataka was the first state to enact its FRBM Act in September 2002, followed by Kerala (2003), Tamil Nadu (2003) and Punjab (2004). Other states also adopted these legislations to avail of the benefits under the incentive scheme recommended by the FC-XII. The adherence to these legislations was also supported by the implementation of Debt Swap Scheme from 2002-2003 to 2004-2005 and Debt Consolidation and Relief Facility from 2005-2006 to 2009-2010 by the Central government. These two debt restructuring schemes provided debt relief through debt consolidation, and reduced interest burden on the states. In addition, a turnaround in interest rate cycle also contributed to a gradual reduction in effective interest rates with debt servicing costs declining over time. Reflecting all these developments, the debt position of the state governments improved significantly in the recent period, with average debt-GDP ratio of 22.2 percent during 2012-2013 to 2015-2016 as compared to around 31 percent in the last decade and half. However, at a disaggregated level, the debt-GSDP ratio was higher than 30 percent in Kerala,

Punjab, Uttar Pradesh and West Bengal while it was above 25 percent in Bihar, Goa and Rajasthan in the latest period (Table 2). Odisha recorded a remarkable improvement in its debt-GSDP ratio during the period 2004-2005 to 2015-2016.

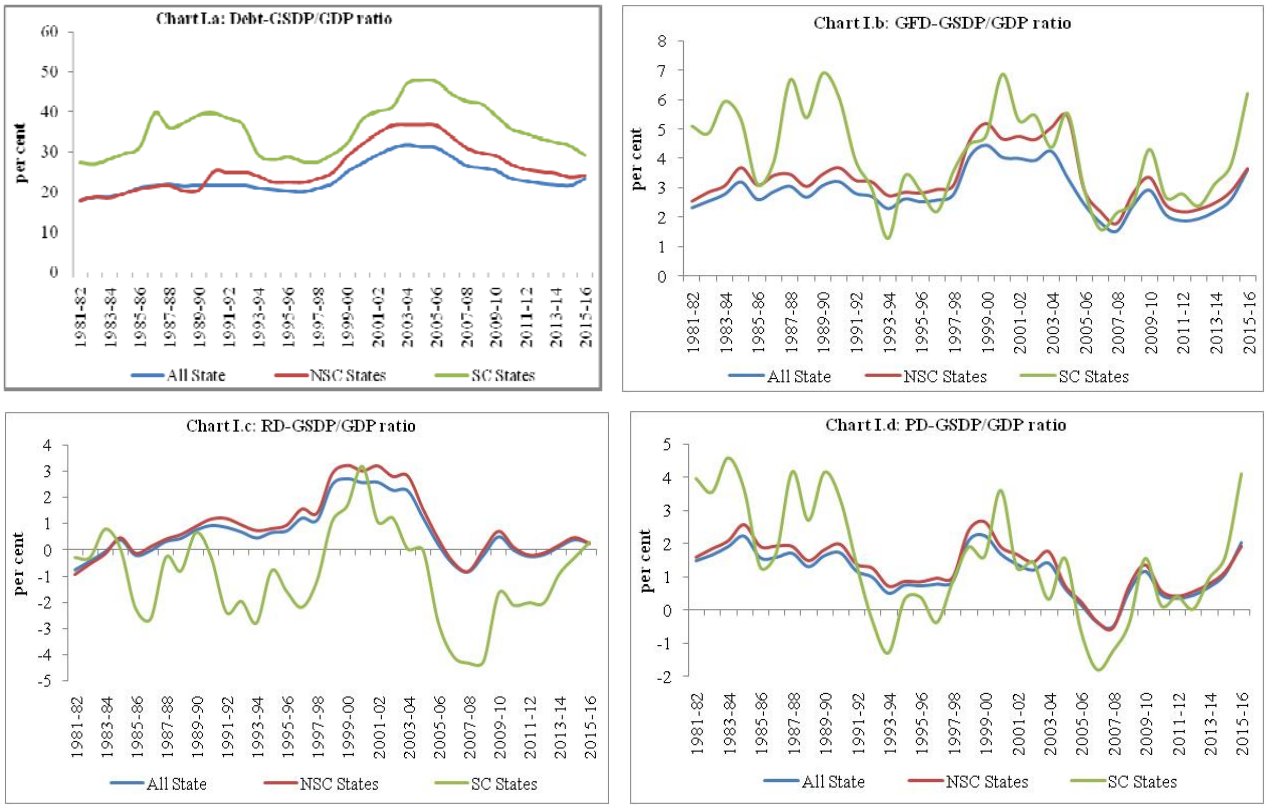

Figure 1 Key Fiscal Indicators of State Governments

Note: 1. Ratios pertaining to "All States" are as percentage to GDP.

2. NSC and SC refer to non-special and special category states, respectively.

6. Assessment of Debt Sustainability at the State Level in India

In the empirical literature, there are primarily two approaches to fiscal (debt) sustainability. The first approach basically looks at various indicators of the sustainability of fiscal policy (Miller, 1983; Buiter, 1985, 1987; Blanchard, 1990; Buiter, Corsetti & Rubini, 1993) while the second approach involves empirical evaluation or tests of government solvency (Hamilton & Glavin, 1987; Trehan & Walsh, 1988; Bohn, 1998). The empirical testing techniques include determination of sustainable (long-run and maximum sustainable) level of public debt based on a partial equilibrium framework, a model-based approach and signal approach to fiscal sustainability. Marini and Piergallini (2007), however, suggest an integration of the results from these two approaches so as to provide additional information on the issue of government solvency. While indicators are said to be forward looking, tests are considered backward looking as they are based on historical data. It is the stability of the parameters of the primary surplus equation which in fact determines the usefulness of results derived from indicators or from tests in the assessment of the sustainability of public debt. It is held that "*without a systematic break in policy, the predictions of tests are more reliable since the results of indicators are likely to reflect cyclical*

factors". This paper has used both indicator-based approach and empirical testing techniques for an assessment of debt sustainability at the state level.

Table 2 States' Debt-GSDP/GDP Ratio (Average)

(in percent)

States	(1981-1982 to 1991-1992)	(1992-1993 to 1996-1997)	(1997-1998 to 2003-2004)	(2004-2005 to 2011-2012)	(2012-2013 to 2015-2016)
1	2	3	4	5	6
Andhra Pradesh*	18.8	20.6	27.3	27.7	21.4
Bihar	42.3	53.9	56.0	43.0	25.2
Chhattisgarh			25.5	18.5	14.5
Goa	51.5	41.4	37.1	31.0	26.3
Gujarat	17.6	19.9	30.6	30.3	23.9
Haryana	18.6	18.7	24.6	20.8	21.6
Jharkhand			23.6	25.4	23.1
Karnataka	17.5	17.9	22.7	24.0	22.6
Kerala	14.6	23.7	31.8	33.3	31.5
Madhya Pradesh	27.0	27.9	29.9	33.2	22.2
Maharashtra	14.9	15.6	23.9	25.3	19.7
Odisha	28.3	34.4	47.5	34.2	17.6
Punjab	25.3	32.9	41.5	38.4	32.4
Rajasthan	25.7	25.4	37.8	37.6	27.1
Tamil Nadu	14.0	17.4	21.9	21.9	19.6
Uttar Pradesh	23.8	32.9	43.6	44.8	32.8
West Bengal	19.8	23.0	36.9	45.0	35.7
NSC States	**20.7**	**23.3**	**31.2**	**31.3**	**24.5**
SC States	**34.1**	**30.1**	**36.7**	**41.9**	**31.7**
All States	**18.3**	**20.8**	**26.8**	**26.9**	**22.1**

***** The state of Andhra Pradesh includes the liabilities of newly formed state Telangana.

Note: 1. All Ratios pertaining to "All States" are percentages to GDP.

2. All variables are in nominal terms.

3. NSC and SC refer to non-special and special category states, respectively.

Source: RBI, various reports of "State Finances: a Study of Budgets" and authors' calculations.

6.1 Indicator-based Assessment

Traditionally, debt sustainability analysis, under indicator-based assessment, takes into account credit-worthiness indicators (nominal debt stock/own current revenue ratio; present value of debt service/own current revenue ratio) and liquidity indicators (debt service/current revenue ratio and interest payments/current revenue ratio). These indicators broadly enable an assessment of the ability of a State government to service its interest payments and repay its debt as and when they become due through current and regular sources of revenues excluding temporary or incidental revenues as grants or capital revenue resulting from sale of assets. Alternatively, debt and debt-service indicators are monitored to assess relationship of existing debt to different types of expenditures or as ratios to various fiscal balances so as to gauge sustainability of both debt and fiscal situation.

An improvement in fiscal conditions creates fiscal space, and enhances debt repayment capacity, while worsening of fiscal conditions entails higher borrowings, adding to the debt burden. In certain situations, the improvement in debt-servicing conditions could also be policy-induced, as discussed in the earlier section. From an analytical point of view, both trends in various fiscal indicators as also characteristics of institutions matter for an assessment of debt sustainability at the state level. In addition, debt sustainability is also associated with a non-financial dimension about the capacity to plan, organise and implement policies, which may be both budget and debt-related.

An analysis based on various indicators of debt sustainability in different phases during the period 1981-1982 to 2015-2016 (Table 3) reveals that the rate of growth of debt of states at the aggregate level exceeded the nominal GDP growth rate during Phase I (1981-1982 to 1991-1992), Phase III (1997-1998 to 2003-2004) and Phase V (2012-2013 to 2015-2016). However, the Domar stability condition that the real rate of interest on debt (i.e., effective interest rate adjusted for inflation) be lower than the real GDP growth was fulfilled in all the phases except in Phase III when the real rate of interest was almost equal to the real output growth. Here, effective interest rate represents current interest payments as a per cent of outstanding liabilities of state governments in the previous year.

Both primary balance and primary revenue balance remained negative in all the phases, even as there was some improvement in primary revenue balance-GDP ratio in the last two phases. Interest payments (average), which had crossed one-fifth of revenue receipts (considered as a tolerable ratio of interest burden, Dholakia et al., 2004) during Phase III, declined to 16.5 percent and 11.8 percent of revenue receipts in Phase IV and Phase V, respectively.

Table 3 Fiscal Sustainability of All State Governments — Indicator-based Analysis

Sl. No.	Indicators	Symbolic Representation	Phase-I	Phase II	Phase III	Phase IV	Phase V
			1981-1982 to 1991-1992	1992-1993 to 1996-1997	1997-1998 to 2003-2004	2004-2005 to 2011-2012	2012-2013 to 2015-2016
1	2	3	4	5	6	7	8
1	Rate of growth of public debt (D) should be lower than rate of growth of nominal GDP (G)	D - G < 0	2.1	-1.8	7.5	-5.1	1.4
2	Real rate of interest (r) should be lower than real output growth (g)	r - g < 0	-7.2	-6.0	0.0	-6.6	-6.3
3(a)	Primary balance (PB) should be in surplus	PB/GDP > 0	-1.6	-0.8	-1.6	-0.3	-1.1
3(b)	Primary revenue balance (PRB) should be in surplus	PRB/GDP > 0	-1.4	-2.5	-4.6	-2.0	-1.6
4(a)	Revenue Receipts (RR) as a per cent to GDP should increase over time	RR/GDP ↑↑	11.3	11.3	10.5	12.0	12.9
4(b)	Public debt to revenue receipts ratio should decline over time	D/RR ↓↓	1.8	1.8	2.6	2.2	1.7
5(a)	Interest burden defined by interest payments (IP) as a per cent to GDP should decline over time	IP/G ↓↓	1.2	1.8	2.4	2.0	1.5
5(c)	Interest payments (IP) as a per cent of revenue receipts (RR) should decline over time	IP/RR ↓↓	10.4	15.8	22.6	16.5	11.8

Source: RBI, various reports of State Finances a Study of Budgets and authors' calculations.

The trend in debt-GDP ratio of all states was influenced by the differential between the GDP growth and effective interest rate during the period under review (Figure 2).

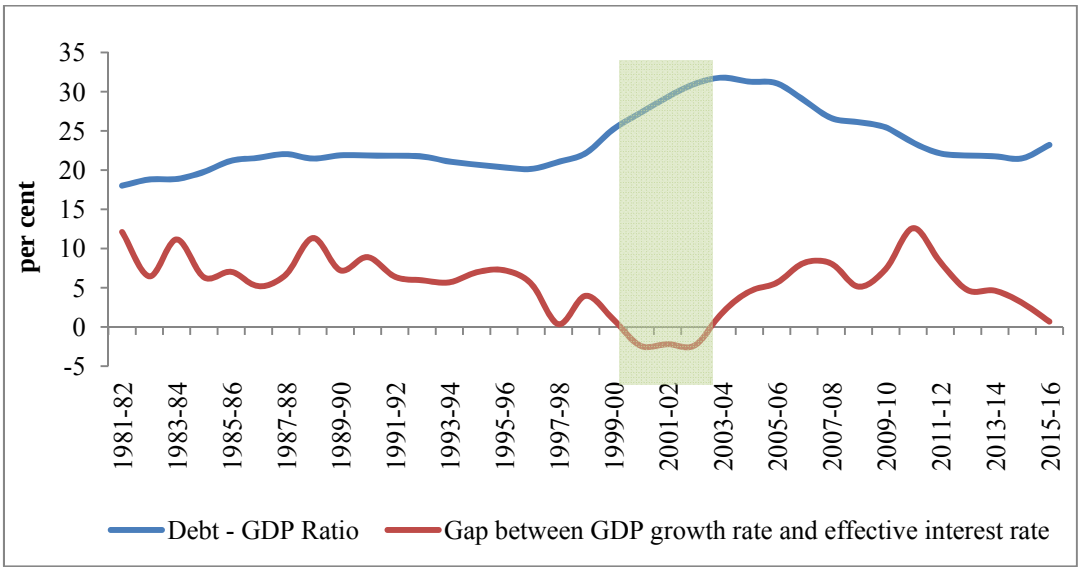

Figure 2 Sustainability of Debt (All States)

A state-wise position in respect of debt sustainability indicators for 17 non-special category states is presented in Table 4. It may be seen that in all the states the rate of growth of GSDP was higher than the effective interest rate in the last two phases, even as the gap between the two narrowed down in Phase V (Table 4a). Furthermore, the rate of growth of public debt turned out to be higher than the GSDP growth in several states in Phase V, which is a cause of concern (Table 4b). The debt redemption pressure is also evident from the ratio of debt redemption (principal and interest payments) to total debt receipts, which shot up from 64.1 percent during 1981-1982 to 2003-2004 to 79.8 percent during 2004-2005 to 2015-2016. This is indicative of a smaller proportion of borrowed funds being available for productive uses by the state governments during the latter period.

In addition to the debt sustainability indicators as discussed above, it may also be appropriate to analyse debt profile linked vulnerability indicators *viz.*, spread on state government debt, average maturity and ownership pattern of debt. These indicators provide an idea about liquidity and pricing risks associated with the level of debt and its composition. From 1988-1989 onwards, the weighted average yield on state government securities has been observed to be marginally higher than that on the Central government securities. Before this period, these loans were intermediated by the Central government. The ownership pattern of state government securities indicates a pre-dominance of commercial banks, although their share in total outstanding state government securities has declined steadily from 78.5 percent in end-March 1991 to 61.9 percent in end-March 2000 and further to 42.1 percent in end-March 2016. The share of insurance companies has, however, increased significantly during the same period. As the state government securities are eligible for being counted towards SLR requirements of banks, investment in these securities is considered credit-risk free. Higher yield on these securities *vis-a-vis* Central government securities is another attraction for long-term investors. The state-specific fiscal performance related risk factors are presumably not being factored in by the investors. However, this situation may not continue for long in case there is any deviation in the extant institutional arrangement for management of state government debt.

Table 4 Indicators of Debt Sustainability

a: Sustainability of debt (Rate of growth of GSDP (g) should be higher than effective interest rate i; g-i > 0)					
State	1981-1982 to 1991-1992	1992-1993 to 1996-1997	1997-1998 to 2003-2004	2004-2005 to 2011-2012	2012-2013 to 2015-2016
1	2	3	4	5	6
Andhra Pradesh $	8.4	6.3	-0.5	7.6	7.7
Bihar	6.8	3.2	-0.5	9.6	12.1
Chhattisgarh			-0.6	9.8	6.9
Goa	9.1	12.2	5.5	11.8	1.3
Gujarat	5.6	10.8	-0.3	7.9	5.3
Haryana	7.0	4.4	0.5	8.6	5.5
Jharkhand			-2.5	5.7	6.0
Karnataka	7.3	6.4	-0.7	7.5	6.1
Kerala	5.8	3.1	-1.0	5.2	5.6
Madhya Pradesh	7.6	4.4	-0.5	7.1	11.5
Maharashtra	6.3	9.7	-0.2	8.0	6.1
Odisha	5.7	2.5	1.0	8.8	5.8
Punjab	7.8	4.5	-1.4	5.5	3.9
Rajasthan	8.1	6.6	-1.4	8.3	3.6
Tamil Nadu	7.0	7.6	-1.4	8.8	7.8
Uttar Pradesh	6.4	4.9	-2.0	7.2	5.5
West Bengal	5.5	3.2	-0.1	4.6	7.0
NSC States	**6.7**	**7.1**	**-0.7**	**7.3**	**6.5**
SC States	**7.5**	**6.9**	**-0.1**	**6.4**	**7.3**
All State	**7.1**	**6.3**	**0.0**	**7.5**	**3.3**
$ The state of Andhra Pradesh includes newly formed state Telangana.					

Notes: 1. All variables are in nominal terms.

2. NSC and SC refer to non-special and special category states, respectively.

Source: RBI, various reports of "State Finances: a Study of Budgets" and authors' calculations.

6.2 Econometric Framework for Assessment of Debt Sustainability at State Level

The fiscal/debt sustainability exercise, in the empirical literature, is extended beyond the simple indicator-based assessment to validate whether inter-temporal government budget constraint is satisfied. This entails test of stationarity properties of the government debt stock (in level and first difference), examination of the long-term relationship between government revenues and expenditures, between primary balances and debt, and between capital expenditure and public debt (Bhatt, 2011). While confirmation of stationarity of government debt stock (in level and first difference) indicates statistical reversion towards mean value after temporary disturbances, the presence of cointegration between government revenues and expenditures reflects their co-movements and anchoring of fiscal imbalances.

Table 4 Indicators of Debt Sustainability

b: Rate of growth of public debt (k) should be lower than growth rate of nominal GSDP (g); k-g < 0					
State	(1981-1982 to 1991-1992)	(1992-1993 to 1996-1997)	(1997-1998 to 2003-2004)	(2004-2005 to 2011-2012)	(2012-2013 to 2015-2016)
1	2	3	4	5	6
Andhra Pradesh $	0.9	0.5	7.4	-5.2	-4.3
Bihar	4.2	-0.9	2.1	-10.2	-4.8
Chhattisgarh		-11.1	-0.5	-11.2	8.1
Goa	-1.1	-11.4	2.1	-7.3	3.4
Gujarat	6.9	-8.3	10.5	-4.4	-3.0
Haryana	1.2	-0.1	6.4	-4.6	8.0
Jharkhand		-9.4	-6.6	2.0	2.8
Karnataka	1.3	0.2	7.0	-2.1	0.4
Kerala	3.9	-0.7	9.1	-1.7	0.7
Madhya Pradesh	2.8	-1.6	3.2	-4.9	-7.5
Maharashtra	5.2	-3.9	10.3	-4.6	-4.4
Odisha	2.9	2.1	4.9	-11.9	-8.0
Punjab	7.9	-0.8	6.3	-5.3	0.6
Rajasthan	-0.6	0.1	8.6	-7.6	7.6
Tamil Nadu	3.1	-1.1	7.8	-4.7	-2.5
Uttar Pradesh	5.5	0.3	7.8	-5.3	1.6
West Bengal	2.4	2.3	11.4	-2.2	-6.1
NSC States	**3.7**	**-2.5**	**8.1**	**-5.1**	**-1.7**
SC States	**3.8**	**-7.7**	**9.0**	**-4.3**	**-4.8**
All State	**2.1**	**-1.8**	**7.5**	**-5.1**	**1.4**
$ The state of Andhra Pradesh includes newly formed state Telangana.					

Notes: 1. All variables are in nominal terms.

2. NSC and SC refer to non-special and special category states, respectively.

Source: RBI, various reports of State Finances a Study of Budgets and authors' calculations.

6.2.1 Inter-temporal Budget Constraint

In line with the empirical literature, we have made an attempt to test whether the fiscal policy stance of Indian states is sustainable, i.e., whether it satisfies the inter-temporal budget constraint. This test basically examines whether the past behaviour of state governments' revenues, expenditure and fiscal deficit could be continued indefinitely without prompting an adverse response from the lenders/investors from/to whom they borrow/sell securities to meet their resource gap.

The inter-temporal budget constraint, under the assumption that the funding of interest payments are not made from the new debt issuances (i.e., no-*Ponzi* scheme), imposes restrictions on the time series properties of government expenditure and revenues. This requires that government expenditure, revenues and debt stock are all stationary in the first differences. The stationarity property also restricts the extent of deviation of government expenditure from revenues over time. In case government expenditure and revenues are I(1) and cointegrated, then 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 (Cashin & Olekalns, 2000).

In this section, to start with, the stationarity properties of state government debt, revenues and expenditure

have been tested in a panel data framework. After having done the stationarity test, we have examined whether a long-run equilibrium exists between government expenditure and revenues through panel cointegration tests.

(1) Data

All data on state government expenditure, revenues and outstanding level of debt have been taken from the "Handbook of Statistics of the Indian Economy", published by the Reserve Bank of India. As already mentioned, the data covers the period 1980-1981 to 2015-2016 for 20 Indian states. A list of the states selected for the present analysis is presented in Appendix I. Only those states have been selected, for which data on all the relevant variables are available for the entire time period. In the case of Bihar, Uttar Pradesh and Madhya Pradesh, the data on respective fiscal variables from 2000-01 also include data relating to Jharkhand, Uttarakhand and Chhattisgarh, respectively. This has been done to ensure comparability of data for the entire period covered in the econometric exercise. The variables have been converted into real terms and logarithmic values of the variables have been considered for the analysis.

(2) Unit Root Analysis

As already mentioned, the stationarity properties of state government debt, revenues and expenditure are tested through panel unit root tests. Panel unit root tests are perceived to be more powerful than the unit root test applied on a single series. This is because the information content of the individual time series gets enhanced by that contained in the cross-section data within a panel set up (Ramirez, 2006). There are different methods to carry out panel-based unit root tests. While the panel unit root methodology of Levin, Lin and Chu (2002) assumes that there is a common unit root process across the relevant cross sections, the tests suggested by Im, Pesaran and Shin (2003) and Maddala and Wu (1999) assume individual unit root processes.

The results of panel unit root tests on relevant fiscal variables (debt, total revenues and total expenditure) are furnished in Table 5. It may be seen that the tests (Levin, Lin and Chu; Im, Pesaran and Shin; and Maddala and Wu) failed to reject the null hypothesis of a unit root for government revenues and expenditure in level form. The tests, however, reject the null of a unit root in the first difference. The government debt, on the other hand, was found to be stationary both in level and first difference as per the Levin, Lin and Chu and Im, Pesaran and Shin tests. As per the Maddala and Wu test, however, the government debt turned out to be stationary only in the first difference. Overall, the results reveal that the three variables *viz.*, debt, total revenues and total expenditure are stationary in first difference.

(3) Panel Cointegration

Since log R and log G were found to be I(1), in the next step, an attempt has been made to test, whether there exists a long-run equilibrium (steady state) between government expenditure and revenues through the panel cointegration tests. Panel cointegration technique has an advantage over the cointegration tests for individual series as it allows to selectively pool information regarding common long-run relationships from across the panel while allowing the associated short-run dynamics and fixed effects to be heterogeneous across different series of the panel (Pedroni, 1999).

In this section, the methodology proposed by Pedroni (1999) has been used to test whether a cointegrating relationship exists between government revenues and expenditure of the selected Indian states under study. This method employs four panel statistics and three group panel statistics to test the null hypothesis of no cointegration against the alternative hypothesis of cointegration. In the case of panel statistics, the first-order autoregressive term is assumed to be the same across all the cross sections. On the other hand, in the case of group panel statistics, the parameter is allowed to vary over the cross sections. The statistics are distributed, in the limit, as standard

normal variables with a left hand rejection region, with the exception of variance ratio statistics. The results of the cointegration tests are presented in Table 6.

Table 5 Results of Panel Unit Root Test

Variables (Levels)	LLC t Statistics	IPS W Statistics	Maddala & Wu PP- Fisher Chi Square
1	2	3	4
States' Debt (log B)	-2.86*	-2.19*	46.95
Government Revenue (log R)	2.85	8.30	4.04
Government Expenditure (log G)	1.63	7.90	6.39
Variables (Differences)			
States' Debt (D log B)	-16.13*	-15.79*	310.49*
Government Revenue (D log R)	-27.51*	-28.52*	564.71*
Government Expenditure (D log G)	-26.06*	-25.55*	577.12*

Note: 1. LLC = Levin, Lin, Chu (2002); IPS = Im, Pesaran, Shin (2003)

2. The statistics are asymptotically distributed as standard normal with a left hand side rejection area

3. * indicates the rejection of the null hypothesis of non-stationarity (LLC, IPS and Maddala & Wu) at 1 percent level of significance

4. Automatic selection of lags through Schwarz Information Criteria (SIC)

5. All panel unit root tests are defined by Bartlett kernel and Newly West bandwidth

Table 6 Panel Cointegration Tests for Government Revenue and Expenditure

Test Statistics	Panel Statistics	Group Statistics
1	2	3
Model with no deterministic intercept or trend		
V statistics	12.20* (0.00)	
Rho statistics	-11.16* (0.00)	-8.27* (0.00)
PP statistics	-7.76* (0.00)	-8.90* (0.00)
ADF statistics	-7.45* (0.00)	-8.50* (0.00)
Model with individual intercept and no deterministic trend		
V statistics	9.43* (0.00)	
Rho statistics	-9.90* (0.00)	-6.87* (0.00)
PP statistics	-8.26* (0.00)	-7.61* (0.00)
ADF statistics	-8.45* (0.00)	-8.11* (0.00)
Model with individual intercept and individual trend		
V statistics	14.46* (0.00)	
Rho statistics	-6.63* (0.00)	-3.83* (0.00)
PP statistics	-6.62* (0.00)	-6.47* (0.00)
ADF statistics	-6.92* (0.00)	-6.25* (0.00)

Notes: 1. All reported values are asymptotically distributed as standard normal.

2. Figures in the parentheses indicate the respective p-values.

3. * indicates the rejection of the null hypothesis of no cointegration at 1 percent level of significance.

4. Automatic selection of lags through Schwarz Information Criteria (SIC).

5. Newly West bandwidth selection using a Bartlett kernel.

The test results for both the panel and group statistics reveal strong evidence of panel cointegration. The estimated "rho" statistics, variance ratio "V" statistics, Augmented Dickey Fuller "t" statistics and the Phillips and Perron (non-parametric) "t" statistics reject the null hypothesis of no cointegration at 1 per cent level for all the three models: (i) model with no deterministic intercept or trend; (ii) model with individual intercept and no deterministic trend; and (iii) model with individual intercept and individual trend. This implies that the cointegration results are not affected by different modelling assumptions.

The results of the Pedroni test are also supported by Kao residual cointegration test, which rejects the null hypothesis of no cointegration at 1 percent level (Table 7). Thus, the overall findings of the panel cointegration tests reveal that the two series, government revenues and expenditure are cointegrated, indicating a long-term co-movement between them. The results suggest that the current fiscal policies of Indian states are sustainable in the long run.

Table 7 Results of Kao Residual Panel Cointegration Tests

Item	t-Statistic	Prob.
1	2	3
ADF	-12.72*	0.00
Residual variance	0.006	
HAC variance	0.004	

Notes: 1. * indicates the rejection of the null hypothesis of no cointegration at 1 percent level of significance.
2. Newly West bandwidth selection using a Bartlett kernel.
3. Automatic selection of lags through Schwarz Information Criteria.

6.2.2 Fiscal Policy Response Function

Bohn (1998), Adams et al. (2010) and Tiwari (2012) have analysed the response of primary surplus to variations in public debt for the purpose of assessment of fiscal policy/debt sustainability. In case primary surplus (relative to GDP) is observed to be a positive function of public debt (relative to GDP), it implies that rising debt ratios lead to higher primary surpluses relative to GDP, which is indicative of a tendency towards mean reversion and thus fiscal/debt sustainability. We have also used this approach in the following analysis.

(1) Model Specification

The following equation is estimated in a panel data framework with annual data from 1980-1981 to 2015-2016.

$$S_t = \alpha_0 + \beta D_{(t-1)} + \alpha_1 GSDPGAP_t + \alpha_2 EXPGAP_t + \varepsilon \quad (3)$$

In this equation, GSDP is the gross state domestic product; S is the primary balance to GSDP ratio; D is debt to GSDP ratio; GSDPGAP is the deviation of actual output from the trend; EXPGAP is the deviation of actual primary expenditure from the trend; ε is the error term. The business cycle variable GSDPGAP has been included to account for the fluctuations in revenues. The variable EXPGAP captures the impact of deviations of real primary expenditure from its long-term trend on the primary balance ratio. Here 'β' is the key coefficient, which measures the response of primary balance to debt. A value of this coefficient between zero and unity is consistent with a sustainable fiscal policy response to debt. A negative coefficient implies potentially destabilising response. In addition, allowance has been made in the estimations for the response of primary balance to GSDP ratio to be non-linear and allow it to vary with debt levels by introducing a square term of the debt to GSDP ratio as an additional explanatory variable.

(2) Data

As in the earlier empirical exercise, the fiscal response function has also estimated for 20 states, for which data on all the relevant variables are available for the period 1980-1981 to 2015-2016. The data for Bihar, Uttar Pradesh and Madhya Pradesh from 2000-2001 also include that relating to Jharkhand, Uttarakhand and Chhattisgarh, respectively. Outstanding liabilities of each state government have been used to represent the level of their debt. GSDPGAP for each state has been worked out by extracting the deviation in real GSDP from its trend through HP-Filter. The deviation is expressed as a per cent of real GSDP. EXPGAP has been calculated in a similar manner using real primary expenditure of the state governments. The pair-wise correlation coefficients between the explanatory variables were found to be statistically insignificant, thus ruling out any multicollinearity problem.

(3) Results

Before proceeding with the estimation, all the series were tested for stationarity. Based on panel unit root tests involving common unit root process (LLC) as well as individual unit root process (IPS), the dependent variable and the explanatory variable series were found to be stationary, i.e., I (0). The results of the panel unit root tests are furnished in Table 8.

Table 8 Results of Panel Unit Root Tests

Variables (Levels)	LLC t Statistics	IPS W Statistics
1	2	3
States' Debt/GSDP	-2.34*	-2.25*
Primary Surplus/GSDP	-7.16*	-8.30*
GSDPGAP	-7.00*	-11.17*
EXPGAP	-11.71*	-13.29*

Notes: 1. LLC = Levin, Lin, Chu (2002); IPS = Im, Pesaran and Shin (2003)

2.* indicates the rejection of the null hypothesis of non-stationarity at 1 per cent level of significance

3. Automatic selection of lags through Schwarz Information Criteria (SIC).

4. All panel unit root tests are defined by Bartlett kernel and Newly West bandwidth

To decide on the panel models, i.e., whether it is a fixed effect (FE) model or a random effect (RE) model, Hausman test was conducted for each of the two model specifications (linear and non-linear). The summary results of the Hausman test are furnished in Appendix II**.** The results of the Hausman test for both the models indicate that there is a significant difference in the coefficients estimated by the FE and RE models. Therefore, the null hypothesis of correlated random effect is rejected and the alternative hypothesis that individual specific effect is correlated with the explanatory variables is accepted. Accordingly, fixed effect model has been chosen for estimating the two model specifications indicated above.

The models have been estimated through generalized least square technique with cross section Seemingly Unrelated Regression (SUR) with a correction for first order autoregressive error term. The models are adjusted for the heteroscedasticity with White cross-section standard errors and covariance method. The empirical results from the panel regression exercise are presented in Table 9. In Model 1 (linear model), the coefficients of all the explanatory variables were found to be significant at one per cent level. Positive coefficient of D indicates that the primary balance of state governments increases in response to rising debt ratios. This implies that the primary fiscal balance in India responds in a stabilizing manner to increases in debt. Positive coefficient of GSDPGAP implies that primary balance improves when GSDP is above the trend. The negative coefficient of EXPGAP, on

the other hand, indicates that the primary balance declines when primary expenditure is above the trend. These findings are in line with *a priori* expectations.

Table 9 Estimation Results

Explanatory Variables	Estimated Coefficients	
	Model 1 (Linear)	Model 2 (Non-linear)
1	2	3
Constant	-2.78*	-3.77*
	(0.00)	(0.00)
D_{t-1}	0.05*	0.11*
	(0.00)	(0.00)
D_{t-1}^{2}		-0.001*
		(0.03)
GSDPGAP	0.04*	0.04*
	(0.00)	(0.00)
EXPGAP	-0.10*	-0.10*
	(0.00)	(0.00)
AR(1)	0.50*	0.50*
	(0.00)	(0.00)
Adjusted R^2	0.76	0.78
DW	2.03	2.04

Note: 1) Figures in the parentheses represent respective P values
2) * denotes significant at 1% level

In the non-linear equation approach (Model 2), allowance was made for the possibility that the response of the primary balance to debt is better represented in terms of a quadratic function rather than a linear response function. The results suggest that the primary balance function has an inverted "u" shape, implying that the adjustment parameter first rises and then falls.

7. Going beyond the Conventional Debt Sustainability Analysis

In the empirical literature, several studies have gone beyond the conventional debt sustainability analysis in various ways. This has been done by extending the scope of conventional debt analysis (based on the inter-temporal budget constraint in a static environment) to account for fiscal and economic behaviour in response to shocks (sensitivity analysis), fiscal vulnerabilities (stress-testing exercise) and short-term refinancing risks. The interaction of key variables driving debt dynamics is also factored in debt sustainability exercises. There are other studies which have used a more comprehensive concept of debt, covering not only explicit liabilities but also contingent, implicit and off-budget liabilities

After having examined the debt sustainability issue, based on indicator-based approach, inter-temporal budget constraint exercise and fiscal policy response function of states in the earlier sections, an attempt has been made to examine the impact of contingent liabilities on debt/fiscal sustainability of states in India. Article 293 (1) of the Constitution of India provides that a state government can give guarantees within such limits as may be fixed by the State legislature on the security of the Consolidated Fund of the State. Guarantees issued by states are

considered as contingent liabilities on the Consolidated Fund of the State in case of default by the borrower for whom the guarantee is extended. The state governments have generally been conservative in the issuance of guarantees (in respect of loans raised by government departments, public sector undertakings, local authorities, statutory boards and corporations, and co-operative institutions) and follow certain norms, whether stipulated under the State Government Guarantees Act or FRBM Acts/FRLs of states or administrative limits fixed for issuance of guarantees. Under these enactments, limits are fixed on annual incremental guarantees as ratio to GSDP or total revenue receipts (Appendix III). Apart from the differences across states in terms of guidelines relating to guarantees, there are also sharp differences when it comes to awareness about fiscal risk linked to issuance of these guarantees and the state level efforts to reduce outstanding guarantees as a policy initiative.

The guarantee commitments of state governments in respect of state public sector enterprises (SPSEs) have recently emerged as a major source of potential risk to fiscal and debt sustainability at the state level. While the need for issuance of guarantees to SPSEs arose after 1993-1994, when the practice of allocation of a separate share in market borrowings to these enterprises was discontinued, it assumed further importance in the wake of declining budgetary support to these enterprises for meeting their capital requirements. As borrowing requirements of these entities increased, these were backed by issuance of guarantees in several states, resulting in an increase in explicit contingent liabilities of these states. This problem is more acute in those states, which have not enacted any law or framed any rules for fixing the ceiling on guarantees to be given by the state government. On the other hand, there are a few states (Odisha) which have exercised due precaution in putting in place rules to avoid the spill-over effect of these guarantees to State budgets.

The unbridled growth in guarantees issued to SPSEs, which have large outstanding debt and are also incurring losses, have increased vulnerability of these enterprises with fiscal implications for the state governments. This is evident from the data relating to outstanding debt and accumulated losses/profit of SPSEs at end March 2015 (Table 10). In some states, the outstanding debt of SPSEs is of much larger magnitude than outstanding guarantees issued to these undertakings. On top of this, many SPSEs have accumulated huge losses, which indicate their poor debt-servicing capacity entailing the risk of default in future.

A state-wise picture of outstanding liabilities and guarantee commitments including guarantees issued to power sector companies is given in Appendix IV. While the guarantees outstanding as a per cent of outstanding liabilities of all states was around 16.1 percent in end March 2015, it exceeded the all-states average in eight states. Power sector's share was the largest in total guarantees outstanding, with power sector in nine states having a share of more than 80 percent. In fact, the fiscal risk associated with guarantees issued to power sector has repeatedly been experienced since the early 2000s. In 2001, the burden of clearing outstanding dues of state electricity boards to central public sector undertakings was taken over by state governments through issuance of power bonds amounting to 29,606 crore. The accumulated losses of all power distribution utilities (DISCOM) were estimated at 1.90 lakh crore as on March 31, 2011 (Expert Group on Financial Health of State Distribution Utilities; Chairman: Shri B. K. Chaturvedi), requiring another financial restructuring plan (FRP) (October 5, 2012) involving take-over of outstanding short-term loans as of March 31, 2012 to the extent of 50 per cent by the respective states under this plan. The accumulated losses of DISCOMs in the country subsequently increased to approximately 3.8 lakh crore as on March 31, 2015, despite the implementation of FRP in select states where the situation was critical. In 2015-2016, the Central government announced a new Scheme *viz.,* Ujwal Discom Assurance Yojana (UDAY) for the purpose of financial and operational restructuring of the state power

distribution companies (DISCOMs). As on January 9, 2017, 15 states[1] have already signed MoUs to take over 75 percent of outstanding debt of their DISCOMs under the UDAY over a period of two years (and in some cases in five years) adding to their liabilities and involving additional interest expenditure over a period of ten years (Appendix V). Furthermore, these states are also expected to fund the future losses, if any, of DISCOMs in a graded manner and this liability could be as high as 50 percent of the previous year's loss in the year 2020-2021. As on January 9, 2017, the participating states have already taken over debt liability of DISCOMS to the tune of 1.82 lakh crore, i.e., around 42 percent of total outstanding debt of DISCOMs, estimated at 4.3 lakh crore as at end-September 2015. It is, therefore, imperative that the underlying operational efficiency parameters[2] are achieved within the stipulated time frame to bring about a turnaround in financial position of DISCOMs and to avoid state government participation in such restructuring exercises in future, which may assume crisis proportion.

Table 10 Outstanding Debt, Guarantees and Accumulated Profit/Losses of State PSUs in-end March 2015

(Amount in crore)

State	Outstanding Debt	Outstanding Guarantees	Accumulated Profit/Loss
1	2	3	4
Andhra Pradesh	52983.6	7581.34	-10812.19
Assam	2783.52	Nil	-3658.21
Bihar	11693.27	3732.97	-3137.76
Chhattisgarh	13602.11	744.73	-4780.58
Gujarat	42509.05	1652.82	3721.00
Haryana	37847.90	28746.85	-24043.86
Himachal Pradesh	6568.11	2746.24	-2951.26
Jammu & Kashmir	4429.09	2574.78	-2907.29
Jharkhand	7736.75	Nil	-16755.73
Karnataka	32086.94	7251.35	731.66
Kerala	8912.96	5579.21	-198.94
Madhya Pradesh	37178.92	8958.90	-29597.25
Maharashtra	54477.66	2540.30	-9071.83
Manipur	3.05	Nil	-74.74
Meghalaya	1310.44	758.18	-576.93
Mizoram	30.93	18.61	-58.03
Nagaland	61.66	15.00	-49.35
Odisha	7503.98	2001.37	2763.57
Punjab	14597.07	49058.42	-6236.66
Rajasthan	74747.68	90054.11	-83732.89
Sikkim	273.25	109.50	-117.72
Tamil Nadu	62044.08	16951.26	-38233.61
Telangana	50969.43	15249.51	-15343.59
Tripura	245.56	Nil	-634.48
Uttar Pradesh	88850.29	59822.93	-94151.70
West Bengal	23604.19	8060.49	-190.07

Note: 1. Data relating to Odisha, Mizoram and Nagaland pertain to 2013-2014 and those relating to Tamil Nadu to the year 2012-2013.
Source: Comptroller and Auditor General of India (CAG)

[1] In addition, 6 states have signed MoUs to bring about an improvement in operational efficiency of their DISCOMs.
[2] These include reduction of AT & C loss to 15 percent by 2018-2019; reduction in gap between average revenue realized and average cost of supply of power to zero by 2018-2019; and almost all DISCOMs to be profitable by 2017-2018 and 3-4 by 2018-2019.

Majority of the states are yet to implement the recommendation of the Group of State Finance Secretaries on the Fiscal Risk on State Government Guarantees (2002) that appropriate risk weights be assigned to guarantees given by states on the basis of probability of devolvement of guarantees, and adequate budgetary provisions be made for honouring these guarantees in case they devolve on the states. The Group had in fact gone a step further by recommending that "guarantees in regard to liabilities which are clearly intended to be met out of budgetary resources should be treated as equivalent to debt". In case, we take outstanding liabilities of states along with their PSUs, the position of some states turns out to be quite alarming on the back of accumulation of losses of PSUs in these states (Appendix VI).

8. Conclusion

In this paper, the debt sustainability of state governments in India was assessed through indicator-based analysis as well as empirical exercises. The indicator-based analysis revealed that while most of the debt sustainability indicators showed significant improvement during 2004-2005 to 2015-2016 compared to the earlier phase (1997-1998 to 2003-2004), debt repayment capacity and interest burden indicators lagged behind their respective performance levels achieved during 1981-1982 to 1991-1992.

The estimation results based on a panel data framework covering 20 Indian states for the time period 1980-1981 to 2015-2016 revealed that there is a cointegrating relationship between government revenues and expenditure in India, which tantamount to satisfying the inter-temporal budget constraint. Moreover, the estimated fiscal policy response function showed that the primary balance position of Indian states responds in a stabilizing manner to the increases in debt. Thus, both the results indicate that the current debt situation at the state level is sustainable in the long run.

Disaggregated level analysis, however, revealed that despite an overall improvement in debt position of the Indian states, some of the states have not been able to achieve their respective FC-XIII targets. Going forward, there are several developments with a bearing on debt/fiscal sustainability of states in India. First, the committed liabilities of states may increase in case they decide to implement the Seventh Pay Commission Award, even as some of them have their own pay panels. Second, the interest liabilities of states that have participated in financial restructuring of DISCOMs would increase besides additional provision to be made by them for extending financial support to these utilities in case they continue to incur losses in future as spelled out in MoUs signed by them. Third, the guarantees given to other SPSEs in some states, which are also loss-making entities, could also give rise to financial burden on the states. These dimensions would assume importance in case there is any deviation from the extant institutional arrangement for management of state government debt.

Overall, the conventional debt sustainability analysis, as attempted in this paper, shows that debt position of states at the aggregate level is sustainable. While we have not analysed the implicit liabilities (linked to PPP projects and unfunded liabilities related to pension), our paper highlights that the explicit contingent liabilities linked to guarantees given by the state governments have assumed significance in the context of debt sustainability exercise at the state level. Given this, any debt/fiscal sustainability exercise, based only on outstanding liabilities of states does not provide a realistic assessment of the situation at the individual state level. We would like to conclude with an observation of the RBI Group which was set up to assess the fiscal risk of State Government Guarantees (2002) that

"in order to have a norm in terms of debt sustainability the underlying guarantees can be mapped out and likely amount of devolvement could be estimated for future years. The total of such likely devolvement during the life of the guarantees could then be treated as normal debt and clubbed together with debt obligations. Together, the liability could be measured as a ratio of SDP to ensure that debt plus likely devolvement on guarantees during its life is sustainable and to ensure that guarantees are also captured in such measures."

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Appendix I List of States

1. Andhra Pradesh
2. Assam
3. Bihar
4. Gujarat
5. Haryana
6. Himachal Pradesh
7. Jammu & Kashmir
8. Karnataka
9. Kerala
10. Maharashtra
11. Manipur
12. Meghalaya
13. Madhya Pradesh
14. Odisha
15. Punjab
16. Rajasthan
17. Tamil Nadu
18. Tripura
19. Uttar Pradesh
20. West Bengal

Appendix II Results of the Hausman Test for Correlated Random Effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Model 1			
Cross-section random	49.43	3	0.00
Model 2			
Cross-section random	53.28	4	0.00

Appendix III Limits on Guarantee Set in Fiscal Responsibility and Budget Management Acts* or Other Legislations of States

State	Guarantees		
	Act	**Stipulated Limits**	**Guarantee Redemption Fund (GRF)****
Andhra Pradesh	Andhra Pradesh FRBM Act, 2005	The amount of annual incremental risk weighted guarantees to be limited to 90 percent of the total revenue receipts in the year preceding the current year.	GRF set up in 2002-2003
Arunachal Pradesh	Arunachal Pradesh FRBM Act, 2006	The State to be conservative in giving guarantees.	GRF not yet set up
Assam	Administrative ceiling (2000) Assam FRBM Act, 2005	The ceiling on guarantee issued by the state government was fixed at 1,500 crore. Government guarantees to be restricted at any point of time to 50 per cent of State's own tax and non-tax revenues of the second preceding year, as reflected in the books of accounts maintained by the Accountant General.	GRF created vide notification dated September 15, 2009
Bihar	Bihar FRBM Act, 2006	No stipulation relating to guarantees in the Act.	GRF not yet set up
Chhattisgarh	Chhattisgarh FRBM Act, 2006	Outstanding guarantees at the end of the year should not exceed 1.5 per cent of GSDP.	GRF not yet set up
Goa	The Goa State Guarantees Act, 1993	The Government should cap the total outstanding guarantees within the specified limit under the Goa State Guarantees Act, 1993. The Goa legislature had fixed a limit of 800 crore on the outstanding guarantees in March 2005.	Set up GRF during 2003-04
Gujarat	The Gujarat Sate Guarantees Act, 1963	The Government should cap the total outstanding guarantees within the limit provided in the Gujarat Sate Guarantees Act, 1963. The State legislature decides such limits from time to time. With effect from March 2001, the limit for the total outstanding guarantees is 20,000 crore	Set up GRF in 1963
Haryana	Haryana FRBM Act, 2005	Does not contain any provisions for limiting the guarantees given by the State Government.	GRF set up in July 2003
Himachal Pradesh	Himachal Pradesh FRBM Act, 2005	The total outstanding guarantees should be limited to 40 per cent of revenue receipts for the year preceding the current year.	GRF not yet set up
Jammu and Kashmir	Jammu & Kashmir FRBM Act, 2006	The Act limits the amount of annual incremental risk weighted guarantees to 75 per cent of the total revenue receipts in the year preceding the current year or at 7.5 percent of GSDP of the year preceding the current year, whichever is lower.	GRF set up vide order dated August 22, 2006
Jharkhand	Jharkhand FRBM Act 2007	No guarantee policy has been framed.	GRF not yet set up
Karnataka	The Karnataka Ceiling to Government Guarantees Act, 1999 The Karnataka Fiscal Responsibility Act, 2002	The Act prescribes that the total outstanding guarantees as on the April 1 of any year shall not exceed eighty per cent of the State's revenue receipts of the second preceding year as in the books of the Accountant General of Karnataka. Under the Act, the state government is required not to give guarantee for any amount exceeding the limit stipulated under the Karnataka Ceiling to Government Guarantees Act, 1999	The State Government had set up a "Guarantee Reserve Fund" during 1999-2000. However, it is yet to constitute a GRF.
Kerala	The Kerala Ceiling on Government Guarantees Act, 2003	Under the Act, the Government guarantees as on the 1st day of April of any year shall not exceed 14,000 crore.	GRF not yet set up
Madhya	Madhya Pradesh	The State Government shall limit the annual incremental guarantees	GRF set up in January

Pradesh	FRBM Act, 2005	so as to ensure that the total guarantees do not exceed 80 percent of the total revenue receipts in the year preceding the current year.	2006
Maharashtra	Maharashtra FRBM Act, 2005	The Act does not contain any provision for limiting the guarantees given by the State Government.	GRF not yet set up
Manipur	The Manipur Ceiling on State Government Guarantees Act, 2004	Under the Act, the total outstanding Government Guarantees as on the first day of April of any year shall not exceed thrice the State's Own Tax revenue receipts of the second preceding year as they stood in the books of the Accountant General of Manipur.	GRF set up in 2008-2009
Meghalaya	Meghalaya FRBM Act, 2006	There is no statutory limit as to the outstanding amount of contingent liabilities. However, the State is committed to restricting the issue of guarantees.	GRF set up in 2014-2015
Mizoram	The Mizoram Ceiling on Government Guarantees Act, 2011	The total outstanding government guarantees as on the first day of April of any year shall not exceed 25 percent of the GSDP estimated for the year and fresh guarantees given in a year shall not exceed 3 percent of GSDP estimated for the year.	GRF set up in May 2009
Nagaland	Nagaland FRBM Act, 2005	The Act limits the amount of annual incremental risk weighted guarantees to 1 per cent of total revenue receipts or 1 per cent of the estimated GSDP in the year preceding the current year, whichever is lower. The exercise on risk-weighting of the guarantees not yet done.	GRF set up in 2006-2007
Odisha	Administrative ceiling on guarantees fixed in November 2002	In terms of the administrative ceiling, the total outstanding guarantees as on 1st day of April every year shall not exceed 100 percent of the State's revenue receipts of the second preceding year as reflected in the books of accounts maintained by the Accountant General. Attempt should be made to bring this gradually to the level of 80 percent over the next five years.	GRF set up in 2002-2003, which replaced the Guarantee Reserve Fund introduced as far back as in 1969
Punjab	Punjab FRBM Act, 2003	The Act capa outstanding guarantees on long-term debt to 80 percent of revenue receipts of the previous year; guarantees on short-term debt to be given only for working capital or food credit in which case this must be fully backed by physical stocks.	GRF set up in December 2007 (revised on January 8, 2014 with effect from the Financial year 2012-2013)
Rajasthan	Administrative ceiling (1999) Rajasthan FRBM Act, 2005	The total of loans and Government guarantee as on the last day of any financial year shall not exceed twice the estimated receipts in the Consolidated Fund of the State for that financial year. No separate guidelines relating to guarantees framed under the Rajasthan FRBM Act, 2005. However, there is a provision that total outstanding debt, excluding public account, and risk weighted outstanding guarantees in a year shall not exceed twice of the estimated receipts in the Consolidated Fund of the State at the close of the financial year.	GRF set up in 1999-2000
Sikkim	The Sikkim Ceiling on Government Guarantees Act, 2000	The total outstanding government guarantees as on the first day of April of any year shall not exceed thrice the State's tax revenue receipts of the second preceding year as in the books of Accountant General of Sikkim.	GRF set up in 2005
Tamil Nadu	Tamil Nadu Fiscal Responsibility Act, 2003	The Act caps total outstanding guarantees to 100 per cent of the total revenue receipts of the preceding year or at 10 percent of GSDP, whichever is lower and caps risk weighted guarantees to 75 percent of total revenue receipts of the preceding year and 7.5 percent of GSDP, whichever is lower.	GRF set up in March 2003
Telangana	Telangana FRBM Act, 2005	Under the Act, the amount of annual incremental risk weighted guarantees is limited to 90 percent of the total revenue receipts in the year preceding the current year.	GRF set up by the composite state of Andhra Pradesh in 2002-2003. Telangana yet to frame fresh guidelines for GRF.
Tripura	Tripura FRBM Act, 2005	The Act limits the amount of annual incremental risk weighted guarantees to 1.0 per cent of GSDP of that year.	GRF set up on July 2007
Uttar Pradesh	Uttar Pradesh FRBM Act, 2004	The State Government shall not give guarantee for any amount exceeding the limit stipulated under any rule or law of the State Government existing at the time of coming into force of this Act or	GRF not yet set up

		any rule or law to be made by the State Government subsequent to coming into force of this Act. However, the State has not enacted any law or framed any rules for fixing the ceiling on guarantees to be given by the State Government.	
Uttarakhand	Uttarakhand FRBM Act, 2005	Not to give guarantee for any amount exceeding the limit stipulated under any rule or law of the State Government existing at the time of coming into force of this Act or any rule or law to be made by the State Government subsequent to coming into force of this Act.	GRF set up in 2006-2007
West Bengal	The West Bengal Ceiling on Government Guarantees Act, 2001	The total outstanding Government Guarantees as on first day of April of any year shall not exceed 90 percent of the State revenue receipts of the second preceding year as in the books of Accountant General of the State Government.	GRF set up vide notification dated January 2, 2015

Notes: *: Refers to the original Act. These Acts/legislations have been amended from time to time.
**: GRF is to be utilised for meeting the payment obligations arising out of the guarantees issued by the state government in respect of bonds issued and other borrowings by the state level undertakings or other bodies and invoked by the 'beneficiaries'.
Source: FRBM Acts of respective state governments and Comptroller and Auditor General of India.

Appendix IV Outstanding Liabilities and Guarantees of State Governments (at end-March 2015)

(Amount in crore)

State	Outstanding Liabilities*	Guarantees Outstanding		3 as % of 2	4 as % of 3
		Total	Power sector		
1	2	3	4	5	6
Andhra Pradesh	115265.9**	10675.3	8585.8	9.3	80.4
Assam	35403.2	143.1	56.3	0.4	39.3
Arunachal Pradesh	6121.7	1.0	0.0	0.0	0.0
Bihar	99055.8	2148.7	770.6	2.2	35.9
Chhattisgarh	31181.0	2314.5	714.9	7.4	30.9
Gujarat	202313.4	5983.8	1077.1	3.0	18.0
Haryana	88446.1	30387.7	28354.2	34.4	93.3
Himachal Pradesh	38191.8	4281.3	2454.6	11.2	57.3
Jammu and Kashmir	48303.5	2858.0	2706.2	5.9	94.7
Jharkhand	43569.1	157.2	157.2	0.4	100.0
Karnataka	158552.9	11032.8	265.4	7.0	2.4
Kerala	141946.9	11126.9	37.1	7.8	0.3
Madhya Pradesh	108026.4	20124.3	5936.3	18.6	29.5
Maharashtra	319745.9	7999.5	694.1	2.5	8.7
Manipur	7357.4	193.0	0.0	2.6	0.0
Meghalaya	6751.5	1173.8	1091.0	17.4	92.9
Mizoram	6550.4	96.9	0.0	1.5	0.0
Nagaland	7953.7	70.2	0.0	0.9	0.0
Odisha	50493.3	1671.8	1551.0	3.3	92.8
Punjab	112365.9	66893.3	14032.9	59.5	21.0
Rajasthan	147608.5	94577.8	86979.5	64.1	92.0
Sikkim	3481.4	112.1	0.0	3.2	0.0
Tamil Nadu	191847.0	53697.6	51939.6	28.0	96.7
Telangana	79880.1	18265.2	13587.8	22.9	74.4
Tripura	9319.6	241.5	121.9	2.6	50.5
Uttar Pradesh	290373.3***	70739.6	67530.9	24.4	95.5
Uttarakhand	33480.3	1831.9	1223.8	5.5	66.8
West Bengal	277579.2	9386.0	3398.7	3.4	36.2
All States	2661165.0	428184.5	293266.6	16.1	68.5

Notes: *: Includes public debt and other liabilities
**: This does not include 33477.52 crore of liabilities (largely under public account), which is yet to be apportioned between Andhra Pradesh and Telangana. The same holds for outstanding liabilities of Telangana.
***: This does not include an amount of 17,485.4 crore as on November 8, 2000, which is yet to be apportioned between Uttar Pradesh and Uttarakhand.
Source: Comptroller and Auditor General of India.

Appendix V Ujwal Discom Assurance Yojana

State	Date of signing MoU	Amount outstanding (CPSUs/State Government/Banks (Crore)	Restructuring Process
Andhra Pradesh	June 24, 2016	14720.5	50% of outstanding debt to be taken over by September 30 and 25% by March 31, 2016
Assam	January 4, 2017	1510	75% of outstanding debt to be taken over
Bihar			
North Bihar	February 22, 2016	1282.5	50% of outstanding debt to be taken over in 2015-2016 and 25% in 2016-2017
South Bihar	February 22, 2016	1826.5	50% of outstanding debt to be taken over in 2015-2016 and 25% in 2016-2017
Chhattisgarh	January 25, 2016	1740.2	50% of outstanding debt to be taken over in 2015-2016 and 25% in 2016-2017
Goa	June 16, 2016		Improve operational parameters
Gujarat	Feb 13, 2016		Improve operational and financial efficiency
Haryana	March 11, 2016	34600.0	50% of outstanding debt to be taken over in 2015-2016 and 25% in 2016-2017
Himachal Pradesh	December 8, 2016	3854.0	75% of outstanding debt to be taken over in 2016-2017
Jammu & Kashmir	March 15, 2016	3537.6	100% of the provisional outstanding dues of various CPSUs as on September 30, 2015 to be taken over during 2015-2016 or 2016-2017
Jharkhand	January 5, 2016	7165.4	50% of outstanding debt to be taken over in 2015-2016 and 25% in 2016-2017
Karnataka	June 16, 2016		Improve operational efficiency
Madhya Pradesh	August 10, 2016	34739.0	75% of outstanding debt to be taken over in 5 years.
Maharashtra	October 7, 2016	22097.0	75% of outstanding debt to be taken over in 5 years.
Manipur	July 26, 2016		Improve operational efficiency
Punjab	March 4, 2016	20837.7	50% of outstanding debt to be taken over in 2015-2016 and 25% in 2016-2017
Puducherry	August 10, 2016		Improve operational parameters
Rajasthan			
Ajmer	January 27, 2016	26597.0	50% of outstanding debt to be taken over in 2015-2016 and 25% in 2016-2017
Jaipur	January 27, 2016	28056.0	50% of outstanding debt to be taken over in 2015-2016 and 25% in 2016-2017
Jodhpur	January 27, 2016	25877.0	50% of outstanding debt to be taken over in 2015-2016 and 25% in 2016-2017
Tamil Nadu	January 9, 2017	30420.0	75% of outstanding debt as on September 30, 2015 to be taken over
Telangana	January 4, 2017	11897.0	75% of outstanding debt as on September 30, 2015 to be taken over
Uttar Pradesh	January 30, 2016	53211.0	50% of outstanding debt to be taken over in 2015-2016 and 25% in 2016-2017
Uttarakhand	March 31, 2016		Improve operational efficiency

Source: Ministry of Power.

Appendix VI Outstanding Liabilities of State Governments and State PSUs (at end-March 2015)

(Percent to GSDP/GDP)

State	Outstanding Liabilities	
	State Governments	State PSUs
1	2	3
Andhra Pradesh	22.2	10.2
Arunachal Pradesh	39.3	NA
Assam	19.3	1.5
Bihar	24.6	2.9
Chhattisgarh	14.8	6.5
Gujarat	22.6	4.7
Haryana	20.3	8.7
Himachal Pradesh	37.8	6.5
Jammu and Kashmir	54.9	5.0
Jharkhand	22.1	3.9
Karnataka	22.6	4.6
Kerala	31.3	2.0
Madhya Pradesh	21.3	7.3
Maharashtra	19.0	3.2
Manipur	44.2	0.0
Meghalaya	26.7	5.2
Mizoram	54.2	0.3
Nagaland	39.6	0.3
Odisha	16.2	2.4
Punjab	32.1	4.2
Rajasthan	25.7	13.0
Sikkim	23.9	1.9
Tamil Nadu	19.6	6.4
Telangana	18.6	11.8
Tripura	30.4	0.8
Uttar Pradesh	29.7	9.1
Uttarakhand	24.1	NA
West Bengal	34.7	2.9
All States	**21.2**	**5.1**

Source: Comptroller and Auditor General of India and authors calculation.