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Subnational Fiscal Sustainability Analysis

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Why does Subnational Fiscal Sustainability Analysis Matter?

Subnational fiscal sustainability is important because an insolvent government cannot provide public services. Although the basic sustainability framework applies to any government, subnational fiscal adjustment qualitatively differs from the national one, reflecting the interplay of subnational and national policies. Decentralization has given subnational governments significant spending, taxation, and borrowing power, and subnational fiscal stress and debt crisis in emerging economies highlight the importance of subnational fiscal adjustment and sustainability. Examples include the 1997 debt restructuring agreements between states and the federal government and the Fiscal Responsibility Law in Brazil, the recommendations of the 12th Finance Commission in India mandating states' fiscal responsibility legislation, a new borrowing framework in Mexico, and fiscal legislation in Colombia and Peru. Subnational sustainability analysis should therefore be a centerpiece of Bank's subnational AAA work.

Basic Framework of Subnational Fiscal Sustainability Analysis

The inter-temporal financing constraint of the subnational government:

$$B_t - B_{t-1} = n_t B_{t-1} - X_t \qquad (1)$$

is the fundamental building block for studying subnational debt dynamics both in a historical and forward-looking mode. In equation (1), B_t is the outstanding public state debt measured at the end of period t, X_t is primary fiscal balance in period t, and n_t is the average interest rate payable in year t on the debt stock accumulated by the close of year t–1.[1] For the budget constraint to hold, the primary balance should include all flows that affect the debt level.

For the purpose of policy analysis, it is useful to represent debt and the subnational government budget constraint (1) in percentages of gross state domestic product (GSDP) and disentangle the growth and inflation effects on indebtedness:

$$b_t - b_{t-1} = i_t - x_t - \frac{g_t}{(1+g_t)(1+\pi_t)} b_{t-1} - \frac{\pi_t}{(1+\pi_t)} b_{t-1} \qquad (2)$$

where b_t, i_t, and x_t are respectively the outstanding public state debt, interest payments, and primary balance as a share of GSDP in period t, g_t is the real annual growth rate, and π_t is the annual inflation rate. The terms on the right-hand side of equation (2), in order, are the interest rate, the primary balance (as a share of GSDP), the growth, and inflation effects on domestic debt.[2]

With a consistent set of projections for interest rates, primary balance, growth, and

inflation rates, we can assess debt sustainability under different scenarios using:

$$b_t = \frac{(1+r_t)}{(1+g_t)} b_{t-1} - x_t \qquad (3)$$

where r_t is the real interest rate defined as

$$r_t = [(n_t + 1)/(\pi_t + 1)] - 1 .$$

Why do Subnational and National Fiscal Adjustments Differ?

Although national and subnational debt dynamics are alike, subnational fiscal sustainability analysis differs from the national one. Subnational debt sustainability is complicated by the legislative mandates of central vis-à-vis subnational governments and the intergovernmental finance system. Unable to issue their own currency, subnationals cannot use seigniorage finance. Subnationals cannot freely adjust their primary balance due to potential legal constraints on raising own revenue, varying dependence on central government transfers, and central government's influence on key expenditures such as wages and pensions. When public banks dominate the supply of subnational credit, lending rates could be subsidized and credit risk could be compromised. Many policies affecting the subnational economy and its fiscal health can be largely set by the central government.

Market participants may tolerate unsustainable subnational fiscal policy if they perceive that the central government implicitly guarantees subnational debt service. When a soft budget constraint prevails, subnational governments may live beyond their means, negating competitive incentives and fostering corruption and rent seeking.

Developing a Medium-Term Fiscal Framework

A medium-term fiscal framework (MTFP) serves as the baseline for sustainability analysis. Often, the MTFP is driven by a fiscal crisis. The MTFP involves political tradeoffs and debate over feasible parameters for expenditure adjustment, tax reform, quasi-fiscal adjustment, and reform of the borrowing framework.

The MTFP needs to go beyond published fiscal accounts. Hidden and contingent liabilities can lead to the sudden onset of a fiscal crisis without warning. Potential sources of liabilities include off-budget liabilities of special-purpose vehicles and subnational enterprises, government guarantees, civil servant pensions, nonperforming assets of subnational banks, arrears under the cash accounting system, and liabilities associated with judiciary decisions.

Subnational Fiscal Sustainability Analysis: Base Case

We use the Indian state of Tamil Nadu as an illustration.[3] The baseline simulation follows the fiscal adjustment proposed in Tamil Nadu's MTFP (2005–09). Beyond the MTFP timeframe, the baseline assumption on real interest rate and the subnational primary balance and GDP growth are based on projection in AAA (e.g., CEMs, DPRs, subnational AAA).

Sensitivity Analysis

Sensitivity analysis helps address the failure of simple analytical models to take into account uncertainty. It analyzes fiscal risks and the probability of insolvency. Recent studies propose different methods for analyzing uncertainty. In the cases where historical time series data are available, one can apply econometric techniques. Without historical time series data, as in the case of Tamil Nadu, we rely on the set of stress tests, complemented by an in-depth discussion of key fiscal risks and constraints to fiscal adjustment.

The first sensitivity test sets the real effective interest rate, the real growth rate, and the primary balance after 2006/07 at their historic averages of the 1990s. The test illustrates the ambitiousness of the adjustment envisaged in the baseline projection relative to historical experience. The Government

Table 1. Baseline Simulation as Proposed in Tamil Nadu's MTFP

Assumptions	*2003*	*2004*	*2005*	*2006*	*2007*	*2008*	*2009*	*2010*	*2011*	*2012*	*2013*	*2014*
Real interest rate (r)		5.5	5.5	5.5	5.5	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Real growth rate (g)		8.5	6.5	6.0	6.0	6.0	6.0	6.0	6.0	6.0	5.8	5.7
Primary surplus (x)		–0.3	–0.5	–0.1	0.5	0.8	0.5	0.5	0.5	0.5	0.5	0.5
Debt dynamics*												
Debt (% of GSDP) (b)	27.8	27.3	27.5	27.5	26.9	25.8	25.1	24.4	23.7	23.0	22.3	21.7
	2015	*2016*	*2017*	*2018*	*2019*	*2020*	*2021*	*2022*	*2023*	*2024*	*2025*	*2026*
Real interest rate (r)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Real growth rate (g)	5.5	5.3	5.2	5.0	4.8	4.7	4.5	4.5	4.5	4.5	4.5	4.5
Primary surplus (x)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Debt dynamics*												
Debt (% of GSDP) (b)	21.1	20.5	20.0	19.5	19.0	18.6	18.2	17.8	17.4	17.0	16.6	16.2

* Authors' simulation based on equation (3).

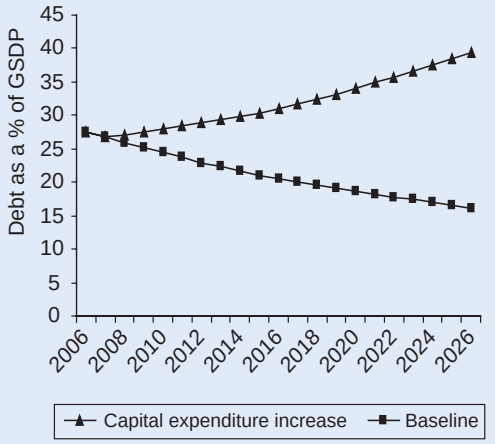
of India started to liberalize interest rates in the mid-1990s, thus the historic real interest rate average does not provide an appropriate benchmark. Therefore, the second sensitivity test leaves the interest rate as in the baseline and sets only the real growth rate and the primary balance after 2006 at their historic averages of the 1990s. This test reveals the costs of loose fiscal policy.

One may conduct a number of stress tests changing the key variables, separately or jointly, by one or more standard deviations from their means, over a period of time. Our tests show that it is the unexpected, adverse combined shock of a more permanent nature (low growth, high real interest rates, and large primary deficits over a period of 5 to 10 years) that will have grave consequences and require a major fiscal adjustment.

Can Fiscal Space for Infrastructure be Expanded during Fiscal Adjustment?

We simulate the impact of an increase in Tamil Nadu's capital expenditure after 2007/08 to 3 percent of GSDP—the average for Indian states. We assume that real economic growth and interest rates will remain as in the baseline, and there will be no effect on the state's revenue. We abstract from questions about the efficiency and effectiveness of public expenditure on infrastructure investment. Under these assumptions, the debt-to-GSDP ratio will gradually climb from 27 percent in 2008/09 to 39 percent by 2026/27, but its debt service payments will increase to 16 percent of revenue over the same period—below the debt stress ratio of 20 percent (Figure 1). This suggests that there is "fiscal space" for an increase in capital investment through additional borrowing without jeopardizing the state's debt service capacity. Tamil Nadu may even avoid the increase in the debt burden if its annual real economic growth increases by 1.6 percentage points from its expected growth rate in 2008/09. Research has shown such an increase may occur as a result of improvements in investment climate.

Figure 1. Impact of Increased Infrastructure Investment in Tamil Nadu



Source: Authors' simulation based on equation (3).

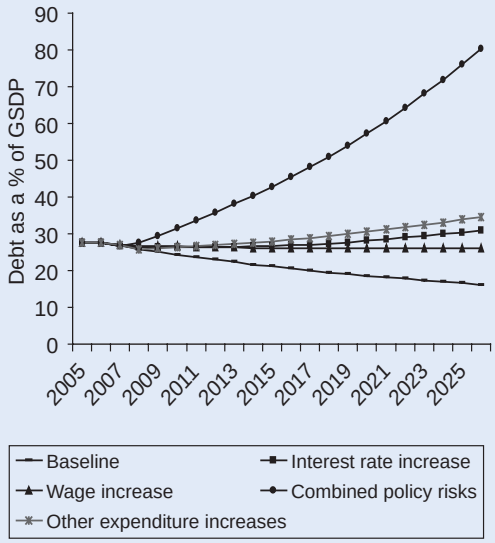
Risks to Fiscal Adjustment

It is important to appreciate how the subnational debt crisis got started and how the interaction of national and subnational policies may evolve. In the case of India's states, key fiscal risks include increases in real interest rates and constraints to primary balance adjustment.

In Tamil Nadu, increases in borrowing and interest rates in the 1990s led to rising interest expenditure. From 2000/01 to 2004/05 declining interest rates helped stabilize interest expenditure, but the risk of rising interest rates due to increased demand for credit and an upturn in international interest rates is real. A hypothetical 3 percentage point increase in the real average borrowing cost after 2007/08 will double Tamil Nadu's debt burden in 2026 compared to the baseline (Figure 2) and lift debt service as a share of revenue to the stress level of 20 percent.

The debt maturity structure impacts rollover risks. One trigger of the Mexican debt crisis in the mid-1990s was the short maturity of subnational debt and variable interest rates. Rapid currency depreciation, a sharp rise in interest rates, and a sharp contraction in the pool of shared revenues eventually triggered a subnational debt crisis. In India, disaggregate data on states' debt maturity are unavailable, but the rollover risks are low due to fixed interest rates and in many cases medium- to long-term debt maturity.

Figure 2. Policy Risks in Tamil Nadu



Source: Authors' simulation based on equation (3).

Adjustment in the primary balance also faces constraints. On the expenditure side, political impulse could push up the number of civil servants and backtrack on progress with wage and pension reform. Large pension liabilities are a major concern for Indian states due to the long-term nature of pension policies, the acquired rights of existing employees, the aging civil service force, and the need for the government to contribute to a newly defined contribution scheme. Moreover, pressures to increase utility subsidies could intensify.

On the revenue side, the potential for increasing the state's tax revenue is limited. The central government reserves the right to tax the service sector, which is the fastest growing sector in Tamil Nadu. Successive central finance commissions have reduced Tamil Nadu's share in the pool of net shareable central taxes.

The 12th Finance Commission has increased incentives for responsible subnational fiscal behavior, with debt consolidation and a waiver scheme linked to reduction in states' fiscal and revenue deficits. However, the enforcement mechanism is lacking. It is also unclear if the incentives offset the negative effect of the deficit grant distribution. The 12th Finance Commission has departed from its tradition of greater weight to equity than economic performance. For Tamil Nadu, this implies reversing the past trend of diminishing states' share in the pool of sharable tax revenue. Nonetheless, it is unclear how future finance commissions will decide on the distribution of revenues given growing disparities among Indian states.

Individually, the above risks may not threaten fiscal sustainability, but their combined effect may derail debt sustainability. A 3 percentage point increase in the real borrowing cost, a percentage point decline in the GSDP growth, and a worsened primary balance reflecting revenue stagnation, de-

crease in central devolution, subsidy increase, and the wage shock after 2008/09[4] will dramatically worsen debt dynamics. Under this hypothetical scenario in 2026/27 the debt services are expected to be 51 percent of revenue—much higher than the debt stress threshold of 20 percent,[5] while the debt burden is expected to be nearly 80 percent of GSDP (Figure 2).

Concluding Remarks

Assessing fiscal sustainability is a complex task as it requires one to form a view about how much fiscal adjustment is politically and socially feasible, and how various components of subnational fiscal accounts respond to policy reform and shocks. At the subnational level, of particular concern are the respective legislative mandates of central vis-à-vis subnational governments and the intergovernmental finance system, which make subnational fiscal adjustment different from the national one. The possibility that such mandates may change is real and particularly relevant for many developing countries where intergovernmental system and the structure of financial markets are continuously evolving. Thus, country context matters. Finally, the analysis is subject to all the caveats pertaining to fiscal sustainability analysis at the national level.

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Endnotes

1. Time is discrete, debt matures in one period, and financing and interest payments take place evenly throughout the year. Debt should be net of comparable assets, while interest payments should be net of any receipts.

2. For countries allowing subnational governments to access external financing, equation (2) must be amended to include the exchange rate effect.

3. Tamil Nadu was the first Indian state where the World Bank worked with the state government to apply the fiscal sustainability framework presented in this PREM Note.

4. The decision of the fifth pay commission of the central government, emulated by many states, contributed to the rapid increase in wages and pensions without accompanying reduction in civil service employment. One cannot rule out the recurrence of such an event.

5. The government of India defines 20 percent or above of debt service over revenue as a threshold of "debt distress."

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