

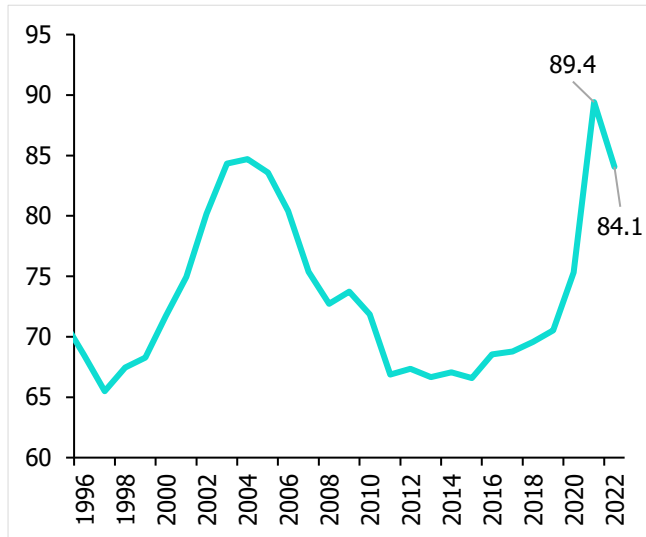
Debt Sustainability Assessment- Scenario Analysis

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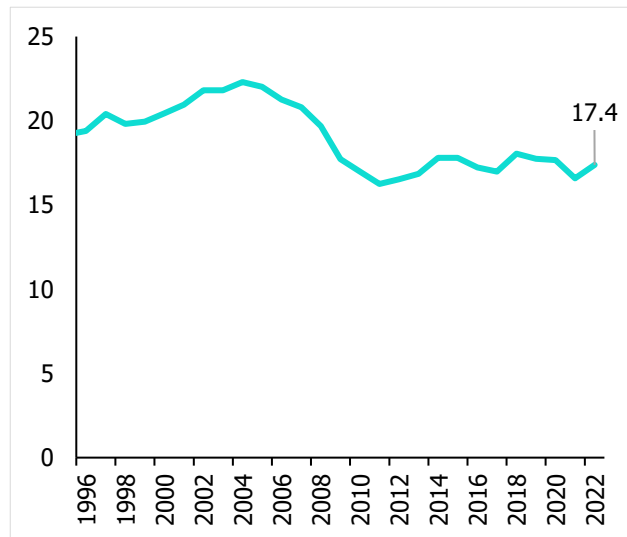
Introduction

Shocks emanating from the Covid-19 pandemic and the Russia-Ukraine conflict have increased the financial obligations of the general government (centre plus states). These unexpected contingencies have led to the general government debt-to-GDP ratio spiking to a historic high of 89.4% of GDP in FY21, significantly higher than the Fiscal Responsibility and Budget Management Act (FRBM) target of 60% of GDP (to be reached by FY25). Increased overall debt will add to the interest payments burden of the general government, which is already high (Refer to Exhibit 1 & 2). Interest payment as a percentage of total expenditure was at around 17% in FY22.

**Exhibit 1: General Government Debt
(% of GDP)**



**Exhibit 2: Interest Payments on Government
Debt as % of Total Expenditure**



Source: CEIC

When the overall debt-to-GDP elevates to high levels, it becomes important to talk about the sustainability of debt and explore the medium-term public debt trajectory in the alternative feasible scenarios for GDP growth, interest rate and primary deficit.

We start by understanding the conceptual underpinnings of the relationship between public debt, GDP growth rate and interest rate. Debt accumulation by the government suggests that the debt requirement in the current time period is equal to the previous period's debt and fiscal deficit in the current period. We can further segregate fiscal deficit into interest payment expenditure and primary deficit.

Mathematically, Government Debt Accumulation can be Written as:

$$\underbrace{D_t}_{\text{debt in period } t} = \underbrace{D_{t-1}}_{\text{debt in period } t-1} + \underbrace{i_t D_{t-1}}_{\text{interest on debt borrowed in period } t-1} - \underbrace{PB_t}_{\text{primary balance in period } t}$$

Negative primary balance implies deficit, while positive denotes surplus.

Defining Debt sustainability:

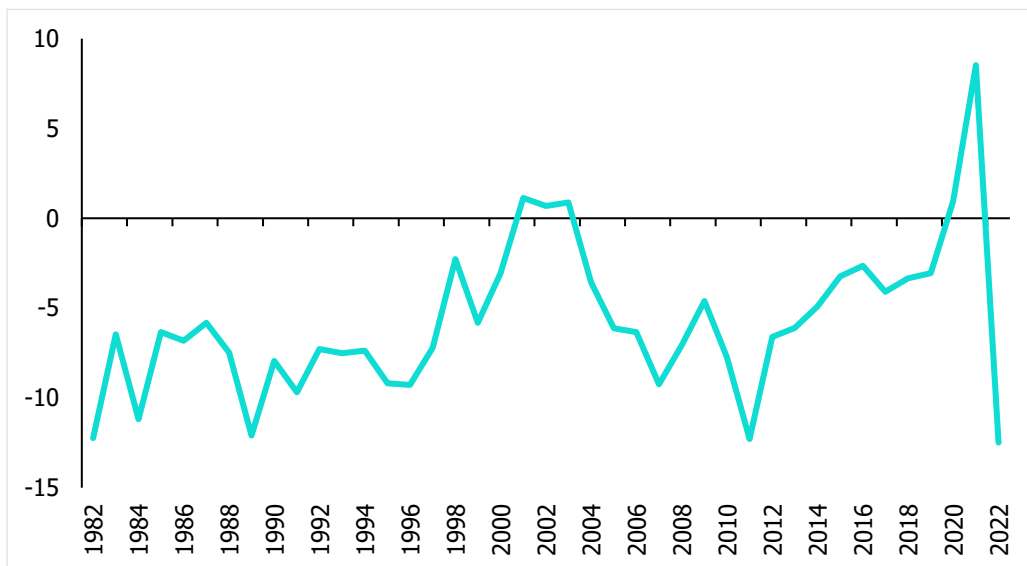
If the change in debt-to-GDP ratio is either 0 or decreasing, then we can say our public debt is on the stable path¹, hence there is debt sustainability. Using the debt accumulation equation (Refer to Box 1 in the end), the stability conditions for debt-to-GDP ratio can be stated as follows:

- a) If the GDP growth rate is higher than the interest rate ($g > r$), the government can ensure a stable debt path by incurring a primary deficit which is not greater than the threshold level.
- b) If the rate of interest is higher than the rate of GDP growth ($r > g$), then the government must run a certain level of primary surplus to have debt sustainability (non-increasing debt-to-GDP ratio).

Thus, the ease with which a government can reduce its debt-to-GDP ratio depends primarily on the magnitude of the difference between interest rate and GDP growth rate. The higher the gap between GDP growth rate and rate of interest, the easier and quicker it is for the Government to ensure debt sustainability.

In the Indian economy past 40 years’ data suggests that the nominal GDP growth rate has always exceeded the nominal effective interest rate (nominal effective interest rate is equal to ratio of interest payments to the previous period’s debt level) except for five fiscal years. However, the magnitude of the difference between GDP growth rate and interest rate has decreased over the last two decades.

Exhibit 3: Difference between Interest Rate & GDP Growth Rate (r-g) largely Remained Negative in last 40 years



Source: CEIC, & CareEdge

Note: (r-g) in the negative territory is good for debt sustainability.

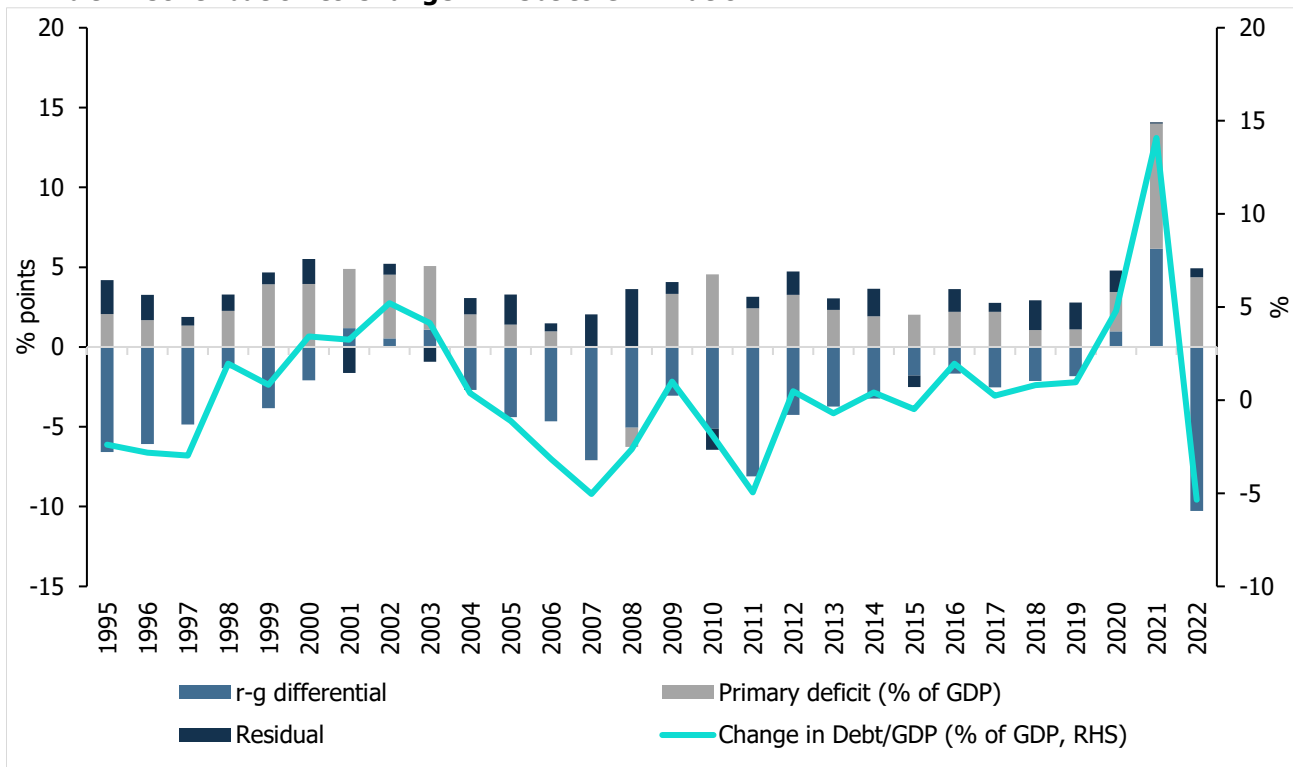
¹ A stable debt path is interpreted as the one with non-increasing debt trajectory. This interpretation comes with several caveats—one such important caveat is a reasonable level of debt to GDP ratio. If the debt to GDP ratio is excessively high, it can have negative consequences on growth and hence, $\Delta d_t = 0$ might not ensure debt sustainability.

Drivers of Change in Debt-to-GDP Ratio

Debt dynamics identity provides an accounting framework to decompose the change in debt-to-GDP ratio into its key drivers. We have decomposed the change in government debt-to-GDP ratio into interest rate and GDP growth rate differential (r-g), primary deficit and residual.

Analysis of this decomposition shows that the contribution of primary deficit towards change in debt-to-GDP ratio has increased in recent years. Further, analysis of the debt creating flows shows that difference between the GDP growth rate and the interest rate has remained supportive of reduction in change in debt-to-GDP ratio during the last two decades (Refer to Exhibit 4).

Exhibit 4: Contribution to Change in Debt to GDP Ratio



Source: CareEdge; Note: r denotes the rate of interest on debt and g denotes nominal GDP growth rate. (r-g) in the negative territory is supportive of debt sustainability/ fall in debt to GDP ratio.

General Government Debt-to-GDP Ratio Trajectory in Different Scenarios

Understanding the trajectory of public debt-to-GDP ratio is crucial amid the challenging environment of slow growth and monetary tightening. Keeping this in mind, we have projected India’s overall debt-to-GDP ratio trajectory from FY23 till FY30.

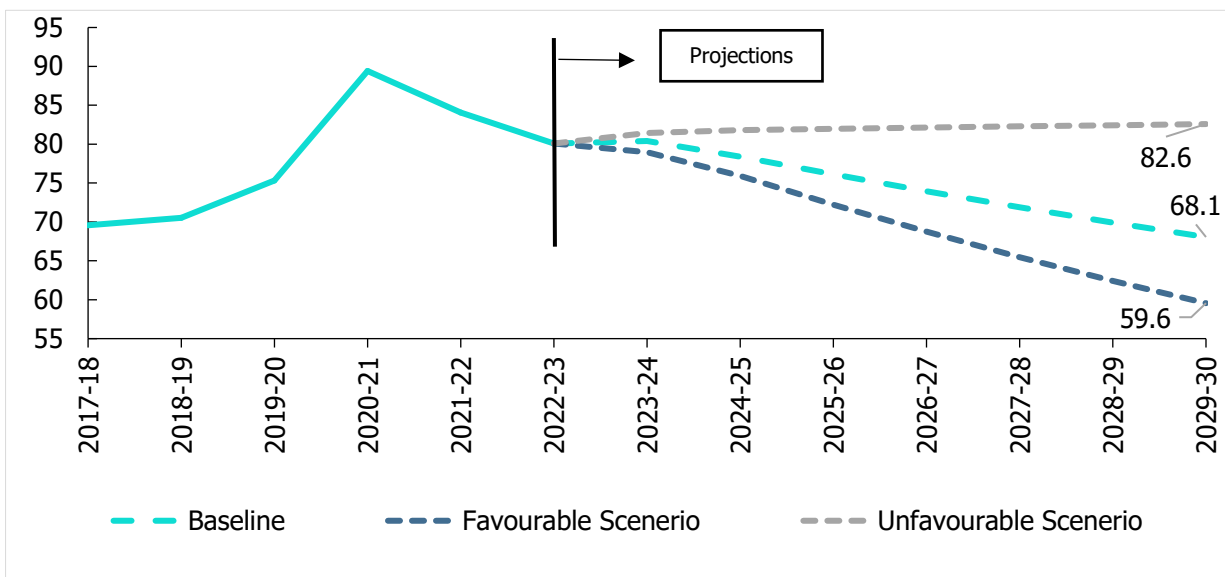
Exhibit 5: Baseline Assumptions

	2022-23	2023-24	2024-25	2025-26 to 2029-30
Nominal GDP growth (%)	15.4	10.0	11.1	11.5
Effective Nominal Interest Rate (%)	8	7.5	7.2	7.2
Primary balance (%)	-3.2	-2.5	-1.5	-1.5

Source: CareEdge

Note: Primary balance baseline assumption for 2022-23 to 2023-24 are based on World Bank Group Macro-Poverty Outlook. Effective nominal interest rate calculated as ratio of interest payments to previous period debt level.

**Exhibit 6: Debt Sustainability Assessment: Scenario Analysis
(General Government debt-to-GDP ratio, %)**



Source: CareEdge

In the baseline scenario, the general government debt-to-GDP ratio is assessed to contract steadily to reach the pre-pandemic level of 70% by FY29. It is likely to fall further to 68% by FY30 (still higher than the FRBM target of 60%). In addition to the baseline scenario, we have also explored both favourable and unfavourable scenarios. In the favourable scenario, nominal GDP growth is assumed to be higher and primary balance is assumed to be lower than the baseline scenario (through targeted efforts at fiscal consolidation). In this favourable scenario, the general government Debt to GDP ratio is assessed to fall to pre-pandemic level of 70% by FY26 and reduce further to 60% (FRBM target) by FY30. In the unfavourable scenario when growth rate and pace of consolidation slowed down, the general government Debt to GDP ratio remains stagnated around 82% till FY30.

In all the scenarios in our analysis, the difference between the GDP growth rate and interest rate helps in debt stabilisation (implying that we have assumed in the all the three scenarios that nominal GDP growth rate higher than the effective nominal interest rate), although the magnitude varies when we move from baseline to alternative (favourable and unfavourable) scenarios.

Going ahead, it is crucial for the government to stick to the fiscal consolidation path and prioritise those expenditures that have higher multiplier effect in terms of generating GDP growth rate. This will ensure the further widening of the gap between GDP growth rate and interest rate and faster reduction in the debt-to-GDP ratio.

Box 1: Debt Dynamics Identity

We can write general government's debt accumulation equation as

$$\underbrace{D_t}_{\text{debt in period } t} = \underbrace{D_{t-1}}_{\text{debt in period } t-1} + \underbrace{i_t D_{t-1}}_{\text{interest on debt borrowed in period } t-1} - \underbrace{PB_t}_{\text{primary balance in period } t} \quad (1)$$

where

Primary balance is defined as general government's revenue (excluding capital receipts) less non-interest expenditure

i_t denotes the nominal interest rate on debt

Dividing both sides of equation (1) by nominal GDP (Y_t), we get

$$\frac{D_t}{Y_t} = \frac{D_{t-1}}{Y_t} + \frac{i_t D_{t-1}}{Y_t} - \frac{PB_t}{Y_t}$$

This can be further be manipulated as

$$\frac{D_t}{Y_t} = \frac{D_{t-1}}{Y_{t-1}} \frac{Y_{t-1}}{Y_t} + \frac{i_t D_{t-1}}{Y_{t-1}} \frac{Y_{t-1}}{Y_t} - \frac{PB_t}{Y_t}$$

$$\text{This implies,} \quad d_t = (1 + i_t) \frac{d_{t-1}}{1 + \gamma_t} - pb_t \quad (2)$$

where

d_t denotes general government debt to GDP ratio in period t ,

γ_t denotes nominal GDP growth rate,

pb_t denotes general government's primary balance to GDP ratio in period t .

Finally, subtracting d_{t-1} from both sides of eq (2), we get

$$\Delta d_t = \frac{i_t - \gamma_t}{1 + \gamma_t} d_{t-1} - pb_t \quad (3)$$

Thus, from equation (3), it is clear that debt to GDP ratio remains stable (i.e. $\Delta d_t = 0$) if the primary balance to GDP ratio is equal to $\frac{i_t - \gamma_t}{1 + \gamma_t} d_{t-1}$. If $i_t > \gamma_t$, then the government must run a certain level of primary surplus to have a non-increasing debt to GDP ratio. However, if nominal GDP growth rate exceeds the nominal interest rate (i.e. $i_t < \gamma_t$), then the government can ensure a stable debt path² by incurring a primary deficit which is not greater than $\frac{\gamma_t - i_t}{1 + \gamma_t} d_{t-1}$.

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