

# Does Growth Lead to Debt Sustainability? Yes, But Not Vice-Versa!

## 02 CHAPTER

प्रजानामेव भूत्यर्थं स ताभ्यो बलिमग्रहीत्।  
सहस्रगुणमुत्स्रष्टुमादत्ते हि रसं रविः॥ १-१८॥

*“The state collects tax for the greater welfare of its citizens in the same way as the sun evaporates water, only to return it manifold in the form of rain.” (Chapter 1, Shloka 18)*

— Mahakavi Kalidasa’s Raghuvansham

*Does growth lead to debt sustainability? Or, does fiscal austerity foster growth? Given the need for fiscal spending amidst the COVID-19 crisis, these questions assume significance. This Chapter establishes clearly that growth leads to debt sustainability in the Indian context but not necessarily vice-versa. This is because the interest rate on debt paid by the Indian government has been less than India’s growth rate by norm, not by exception. As Blanchard (2019) explains in his 2019 Presidential Address to the American Economic Association: “If the interest rate paid by the government is less than the growth rate, then the intertemporal budget constraint facing the government no longer binds.” This phenomenon highlights that debt sustainability depends on the “interest rate growth rate differential” (IRGD), i.e. the difference between the interest rate and the growth rate in an economy.*

*In advanced economies, the extremely low interest rates, which have led to negative IRGD, on the one hand, and have placed limitations on monetary policy, on the other hand, have caused a rethink of the role of fiscal policy. The same phenomenon of a negative IRGD in India – not due to lower interest rates but much higher growth rates – must prompt a debate on the saliency of fiscal policy, especially during growth slowdowns and economic crises.*

*The confusion about causality – from growth to debt sustainability or vice-versa – is typical of several macro-economic phenomena, where natural experiments to identify causality are uncommon. In the specific context of growth and debt sustainability, this confusion also stems from the fact that the academic and policy literature focuses primarily on advanced economies, where causality is entangled by lower potential growth when compared to India. Indeed, the chapter studies the evidence across several countries to show that growth causes debt to become sustainable in countries with higher growth rates; such clarity about the causal direction is not witnessed in countries with lower growth rates. By integrating ideas from Corporate Finance into the macro-economics of Government debt a la Bolton (2016), the Survey lays the conceptual foundations to understand why these differences can manifest between high-growth emerging economies and low-growth advanced economies.*

*As the COVID-19 pandemic has created a significant negative shock to demand, active fiscal policy – one that recognises that fiscal multipliers are disproportionately*

higher during economic crises than during economic booms – can ensure that the full benefit of seminal economic reforms is reaped by limiting potential damage to productive capacity. As the IRGD is expected to be negative in the foreseeable future, a fiscal policy that provides an impetus to growth will lead to lower, not higher, debt-to-GDP ratios. In fact, simulations undertaken till 2030 highlight that given India's growth potential, debt sustainability is unlikely to be a problem even in the worst scenarios. The chapter thus demonstrates the desirability of using counter-cyclical fiscal policy to enable growth during economic downturns.

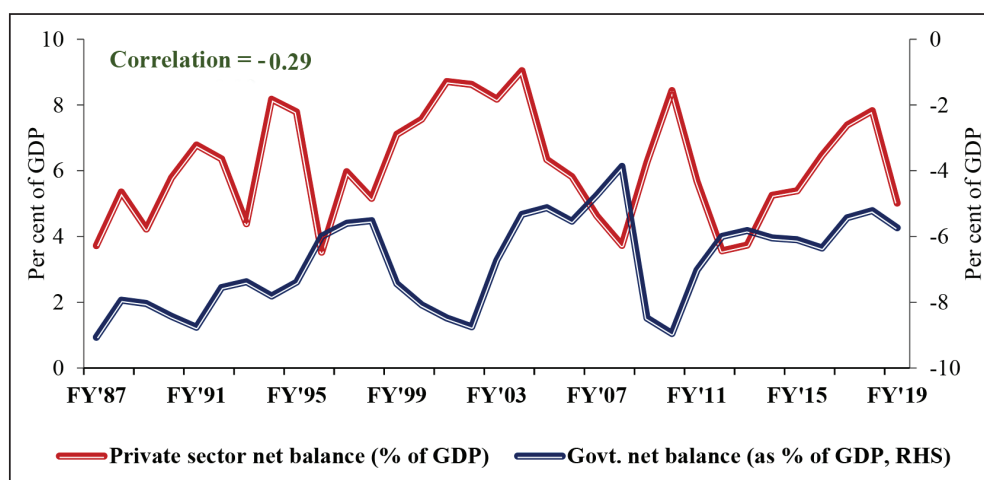
While acknowledging the counterargument from critics that governments may have a natural proclivity to spend, the Survey endeavours to provide the intellectual anchor for the government to be more relaxed about debt and fiscal spending during a growth slowdown or an economic crisis. The Survey's call for more active, counter-cyclical fiscal policy is not a call for fiscal irresponsibility. It is a call to break the intellectual anchoring that has created an asymmetric bias against fiscal policy.

2.1 Amidst the COVID-19 crisis, fiscal policy has assumed enormous significance across the world. Naturally, the debate around higher Government debt to support a fiscal expansion is accompanied by concerns about its implications for future growth, debt sustainability, sovereign ratings, and possible vulnerabilities on the external sector. This chapter examines the optimal stance of fiscal policy in India during a crisis and establishes that the growth leads to debt sustainability in the Indian context and not necessarily vice-versa.

2.2 While fiscal policy is especially salient during an economic crisis, in general, fiscal policy must be counter-cyclical to smooth out economic cycles instead of exacerbating them. As seen for the United States and United Kingdom, the correlation between private sector and public sector net balances is almost perfectly negative (-0.9) (Figure 1b and 1c). In India, however, fiscal policy has not been counter-cyclical in general (Figure 1a).

**Figure 1: Trends in Government and Private sector balances**

**Figure 1a: India (FY 1987 – FY 2019)**

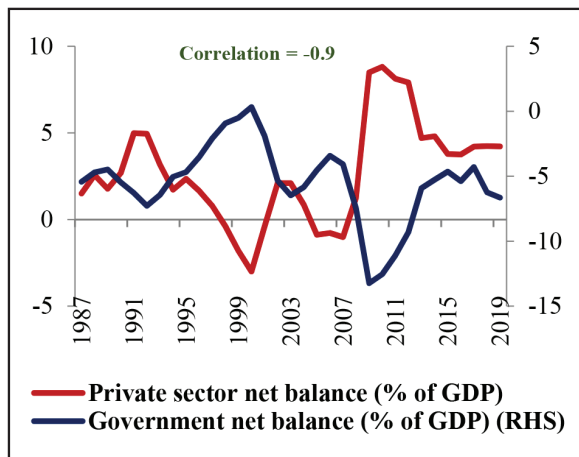


Source: RBI, MoSPI

Note: Govt net balance = (Public Sector Financial & Non-Financial Corporations and General Govt Gross Domestic Saving) – (Public Sector Financial & Non-Financial Corporations and General Govt Gross Capital formation)

Private sector net balance = Private sector Gross Domestic Saving – Private sector Gross Capital formation

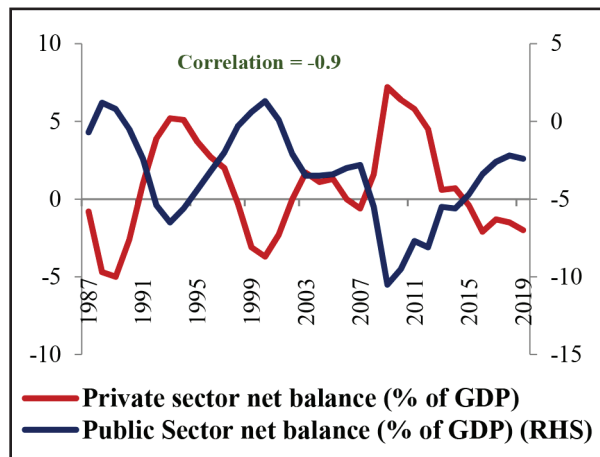
For Households, total savings does not include gold and silver (to make it comparable).

**Figure 1b: United States (1987–2019)**

Source: BEA (US)

Government net Balance = Total Government Receipts - Total Government Expenditure

Private Sector Net Balance = Gross Private Domestic Investment - Gross Private Savings (Domestic business, households &amp; institutions)

**Figure 1c: United Kingdom (1987–2019)**

Source: UK Economic Accounts (ONS) &amp; OBR (UK)

Public Sector net Balance = Net lending by General Govt and Public Corporations

Private Sector Net Balance = Net lending by Households, Non Profit Institutions serving the Households and private Non Financial Corporations

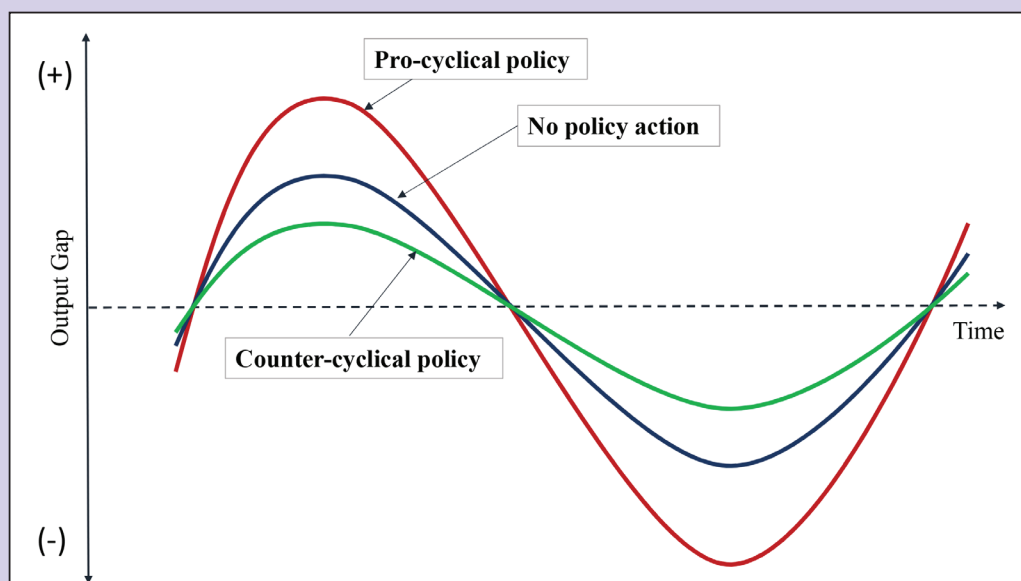
2.3 While counter-cyclical fiscal policy is necessary to smooth out economic cycles, it becomes critical during an economic crisis (Box 1). This is because fiscal multipliers, which capture the aggregate return derived by the economy from an additional Rupee of fiscal spending, are unequivocally greater during economic crises when compared to economic (Box 2). In a country like India, which has a large workforce employed in the informal sector, counter-cyclical fiscal policy becomes even more paramount. In advanced economies, where the public and private sector labour markets are not too segmented, fiscal spending can increase public sector employment, reduce the supply of labour in the private sector, bid up wages, and thereby crowd out private sector employment. However, in a country like India, where the private and public sector labour markets are largely segmented, such crowding out of private sector employment is minimal (Michaillat, 2014). Thus, debt-financed public expenditure is more cost-effective to employ during recessions than during economic booms.

### Box 1: Relevance of Counter-cyclical Fiscal Policy

Indian Kings used to build palaces during famines and droughts to provide employment and improve the economic fortunes of the private sector. Economic theory, in effect, makes the same recommendation: in a recessionary year, Government must spend more than during expansionary times. Such counter-cyclical fiscal policy stabilizes the business cycle by being contractionary (reduce spending/increase taxes) in good times and expansionary (increase spending/reduce taxes) in bad times. On the other hand, a pro-cyclical fiscal policy is the one wherein fiscal policy reinforces the business cycle by being expansionary during good times and contractionary during recessions (Figure A).

Fiscal policy (FP) stance	Recession (↓ GDP)	Expansion (↑ GDP)	Outcome
Pro-cyclical	<u>Contractionary FP</u> ↓ Govt. Expenditure or /and ↑ Taxes	<u>Expansionary FP</u> ↑ Govt. Expenditure or/and ↓ Taxes	Deepens recessions and amplifies expansions, thereby increasing fluctuations in the business cycle.
Counter-cyclical	<u>Expansionary FP</u> ↑ Govt. Expenditure or/and ↓ Taxes	<u>Contractionary FP</u> ↓ Govt. Expenditure or /and ↑ Taxes	Softens the recession and moderates the expansions, thereby decreasing fluctuations in the business cycle.

**Figure A: Business Cycle under Various Fiscal Policy Stance**



### Channels of Transmission

Recalling the National Income identity,  $Y = C + I + G + X - M$ , the net effect of a recession on the private sector may be in terms of lower private consumption (C), lower private investment (I), risk aversion by the private sector and pessimistic expectations/sentiments. In such a scenario, adopting a counter cyclical policy by expanding the Government Expenditure – both consumption and investment - will support the GDP and minimise the output gap (as seen in the figure above). This happens primarily through the following channels:

- (i) An expansion in Government expenditure can cushion the contraction in output by contributing to the GDP growth, by offsetting the decline in consumption and investment; and also by boosting private investment and consumption through higher spending multipliers during recession. (Auerbach and Gorodnichenko (2012), Riera-Crichton, Vegh and Vuletin (2014), Jorda and Taylor (2016), Canzoneri et al (2012)).
- (ii) Through risk multiplier by compensating for greater risk-aversion of private sector to bring back ‘animal spirits’.

(iii) Through expectation multiplier by building confidence in tough times: Governments adopting counter-cyclical fiscal policy are able to credibly exhibit their commitment to sound fiscal management. As a result, rational agents in the economy would expect the economy not to fluctuate as much and therefore their private actions would reinforce this, in turn enabling stronger macroeconomic fundamentals (Konstantinou and Tagkalakis (2011), Alsina et al. (2014)).

Numerous studies in economic literature establish this relationship both theoretically and empirically. Ozkan and McManus (2015) study the impact of cyclicity of fiscal policy on macroeconomic outcomes for 114 countries over 1950–2010 and establish that following a pro-cyclical fiscal stance leads to lower economic growth, higher volatility in output and higher levels of inflation. In contrast a counter-cyclical fiscal policy stance with policy actions against the cycle acts as a stabiliser by reducing output volatility and keeping growth on a steady path. Similarly a study by Kharroubi and Aghion (2008) shows that industries have grown faster in economies where fiscal policy has been more countercyclical, both in terms of output and productivity.

For India, in the current scenario, when private consumption, which contributes to 54 per cent of GDP is contracting, and investment, which contributes to around 29 per cent is uncertain, the relevance of counter-cyclical fiscal policies is paramount. In fact as Krugman prescribed, a sustained, productive program of permanent stimulus directed towards public investment, in both physical and human capital, is the need of the hour (Krugman 2020).

## Box 2: Higher Fiscal Multipliers During Economic Slowdown

Most studies aimed at estimating the variation in effects of fiscal policies with country's position in the business cycle, concur that the fiscal policies are considerably more effective in recessions than in expansions (Barro and Redlick (2011), Auerbach and Gorodnichenko (2012), Fazzari et al. (2015), Ramey and Zubairy (2015)). Auerbach and Gorodnichenko (2012(i), (ii)) in their seminal paper show large differences in the size of spending multipliers in recessions and expansions for the OECD countries and the US, with higher fiscal multipliers during recessionary regimes. These results are maintained after allowing for different multipliers for different components of government spending. They derive the point estimates of the maximum output multiplier (over the first 20 quarters) is estimated to be 0.57 during expansions and 2.48 during recessions in the US.

Riera-Crichton, Vegh and Vuletin (2014) condition the fiscal policy on both the state of the business cycle, and the sign/size of the fiscal intervention, and find that fiscal expansions in recessions are much more expansionary than fiscal expansions in booms. Jorda and Taylor (2016) use the propensity-score based methods for time series data to show that a one per cent of GDP fiscal consolidation translates into a loss of 4 per cent of real GDP over five years when implemented in a slump, and just 1 per cent in a boom.

Different studies attribute this phenomenon of counter-cyclicity of the fiscal multipliers to different channels. Some of these are:

### 1. Easing financial constraints:

- Tagkalakis (2008) shows that the fiscal policy is more effective in boosting private consumption during recessions (for OECD countries from 1970-2002) due to the presence of binding liquidity constraints on households. Since during recessions liquidity constraints might bind across a wider range of households and firms, thus a larger fraction of households and firms will consume the extra income generated following an unanticipated tax cut or government spending increase, leading to greater impact on consumption (wealth effect) and hence output.
- On similar lines, Canzoneri et al (2012) argue that fiscal stimulus decreases the spread (between the bank deposit rate and the bank loan rate), which fluctuates counter cyclically due to the cyclical variation in bank intermediation costs. This in turn encourages more borrowing and spending, which further expands the economy and decreases the spread again, encouraging more borrowing; and the process repeats itself. Since this financial friction (spread) increases during recession, therefore the chain effect of fiscal stimulus in boosting borrowings and output is greater during recession compared to expansionary periods.
- Fiscal multipliers are likely to be higher in recessionary periods because private savings increase through the precautionary motive to save. Therefore, any potential crowding out of private investment - even if at all it manifests during expansionary periods - is unlikely to manifest because of the increased pool of loanable funds.
- Michailat (2014) documents another channel through the labour market that enhances the fiscal multipliers in a recession. Increasing public employment stimulates labour demand, which increases tightness and therefore crowds out private employment. Critically, the quasi-labour supply is convex. Hence, when labor demand is depressed and unemployment is high, the increase in tightness and resulting crowding-out are small.

### 2. Enhanced consumer sentiment for future productivity increases:

- Bachmann and Sims (2011) argue and present evidence that a spending shock during periods of economic slack leads to a persistent increase in the amount of government investment relative to government consumption during a downturn (which is not the case in normal times). This relative increase in government investment spending provides signals about future increases in output and productivity, and hence are reflected in higher measured confidence. This results in higher impact on consumption and output.

## THE (r-g) DIFFERENTIAL AND DEBT SUSTAINABILITY IN INDIA

2.4 As fiscal policy relates very closely with the debate on public debt, we start by understanding the conceptual underpinnings of the relationship between public debt and growth, as seen in the simple equation for debt dynamics discussed in Box 3. From the equation, it can be seen that the debt-to-GDP ratio remains stable over time (i.e.  $d_t = d_{t-1}$ ) if the primary deficit is equal to



$(g-r) \cdot d_{t-1} / (1+g)$ , where  $g$  and  $r$  denote the real growth rate and real cost of general government debt respectively while  $d_{t-1}$  denotes the debt-to-GDP ratio in the previous year. When  $g > r$ , this threshold level of primary deficit is positive. Therefore, as long as the primary deficit remains below this threshold, debt remains sustainable. Along these lines, De Luca (2012) show that as long as primary deficit is a constant fraction of GDP,  $(r-g)$  still remains a sufficient statistic for debt sustainability. Thus, the ease with which a government can reduce its debt-to-GDP ratio ( $d_t$ ) depends primarily on the interest rate-growth differential (IRGD hereafter) or  $(r-g)$ . More negative the IRGD, the easier (and quicker) it is for the Government to ensure debt sustainability. Conversely, if the IRGD is positive, the harder (and slower) it is for the Government to ensure debt sustainability. A negative IRGD thus creates an enabling environment for debt sustainability.

### Box 3: Theory of Debt dynamics

*The simple identity for debt dynamics provides an accounting framework to decompose change in the ratio of government debt-to-GDP into its key drivers, namely (i) the difference between the (real or nominal) interest rate charged on the government debt and (real or nominal) growth rates; (ii) the debt-to-GDP ratio in the previous period, and (iii) the ratio of primary deficit to GDP.*

*The identity for debt dynamics is written as:*

$$\Delta d_t = (r_t - g_t) \cdot d_{t-1} / (1+g_t) - pb_t,$$

*where  $\Delta d_t$  : change in general government debt-to-GDP in year  $t$ ;*

*$r_t$  : real interest rate paid in year  $t$ ;*

*$g_t$  : real GDP growth in year  $t$ ;*

*$d_{t-1}$  : general government debt-to-GDP in year  $(t-1)$ ;*

*$pb_t$  : primary balance-to-GDP in year  $t$ .*

*The same identity can also be written using nominal interest rate and nominal growth rate:*

$$\Delta d_t = (i_t - \gamma_t) \cdot d_{t-1} / (1+\gamma_t) - pb_t,$$

*where  $i_t$  : nominal interest rate paid in year  $t$ ;*

*$\gamma_t$  : nominal GDP growth in year  $t$*

*and other variables are as above.*

*This equation can be derived from the basic identity that inflows and outflows have to be equal for the Government i.e.*

$$\underbrace{D_t}_{\text{Debt borrowed in year } t} + \underbrace{R_t}_{\text{Revenues in year } t} = \underbrace{D_{t-1}}_{\text{Repayment of debt borrowed in year } t-1} + \underbrace{I_t}_{\text{Interest on debt borrowed in year } t-1} + \underbrace{NIE_t}_{\text{Non-interest expenditure in year } t}$$

*or*

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

*where  $PB_t$  is the primary balance defined as  $NIE_t - R_t$  and*

*$i_t$  is the interest paid on the debt in year  $t$ .*

On dividing both sides of the equation by  $GDP_t$ , and denoting all ratios as proportion of GDP by their lower-case letters, i.e.  $d_t \equiv D_t / GDP_t$  for instance, we get:

$$d_t = \frac{1 + i_t}{1 + \gamma_t} d_{t-1} - pb_t$$

where we substitute  $\frac{GDP_t}{GDP_{t-1}} = (1 + \gamma_t)$ .

Subtracting  $d_{t-1}$  from both sides of the above equation, we get the first equation above using real interest and growth rates.

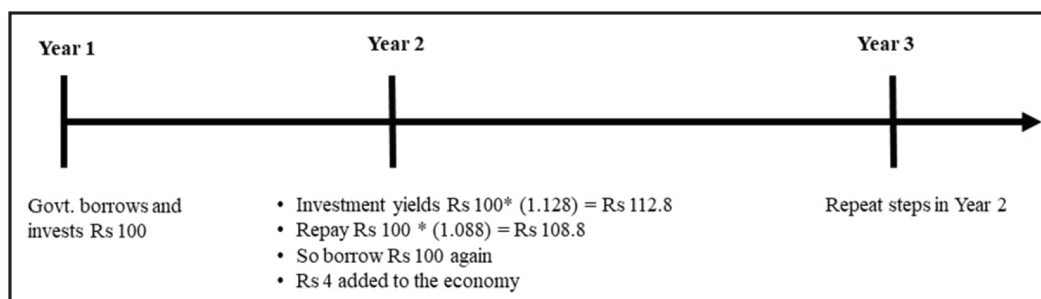
We know from the Fisher's equation that  $(1 + i_t) = (1 + r_t)(1 + \pi_t)$  and  $(1 + \gamma_t) = (1 + g_t)(1 + \pi_t)$ , where  $\pi_t$  denotes the inflation in year  $t$ . Using the same, we get:

$$d_t = \frac{1 + r_t}{1 + g_t} d_{t-1} - pb_t$$

Note that both the equations – the one using nominal interest and growth rates and that one using real interest and growth rates – are identical and equivalent to each other. Sometimes, doubt arises if the two equations are indeed identical? This is because of the comparison between the fractions  $\frac{r_t - g_t}{1 + g_t}$  and  $\frac{i_t - \gamma_t}{1 + \gamma_t}$ . It appears as though the only difference is in the denominator of the fraction with the real growth rate replaced by the nominal growth rate because the differences  $(r-g)$  and  $(i-\gamma)$  must be identical. The confusion arises from using the approximation  $i \approx r + \pi$  and  $\gamma \approx g + \pi$ , which leads to the incorrect inference that  $(r-g)$  and  $(i-\gamma)$  must be identical. However, the confusion gets settled when one recognizes that these are only approximations where the product terms in the Fisher equation ( $r \cdot \pi$  and  $g \cdot \pi$ ) have been ignored.

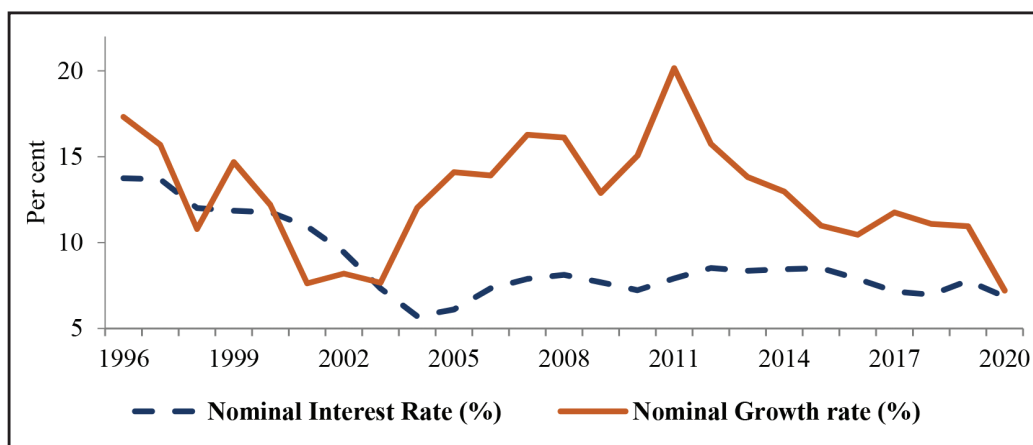
2.5 As a norm in India, over the last two and a half decades, GDP growth rates have been greater than interest rates (Figure 2a). This evidence is consistent with the phenomenon described by Blanchard (2019) in his 2019 Presidential Address to the American Economic Association: “If the interest rate paid by the government is less than the growth rate, then the intertemporal budget constraint facing the government no longer binds.” Intuitively, when  $i_t > \gamma_t$  or nominal interest rate exceeds the nominal growth rate for the foreseeable future, debt sustainability is obtained as explained in the figure below. Here,  $i_t$  and  $\gamma_t$  are taken to be their historical averages for last 25 years, 8.8 per cent and 12.8 per cent respectively. As the government's investment of a ₹ 100 produces ₹ 112.8 while the principal and interest repayment equals ₹ 108.8, ₹ 4 can be added to the economy after the loan of ₹ 100 is rolled over to the next period. Of course, this roll-over of the debt that yields debt sustainability can only manifest if  $i_t > \gamma_t$ . If the inequality reverses, then rollover of debt does not become automatic, thereby jeopardizing debt sustainability.



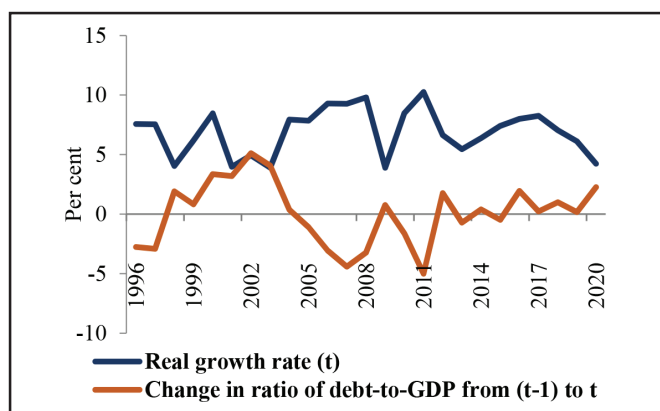


2.6 This inequality has thus led to a negative IRGD for most of the years during the last two and a half decades, which, in turn, has caused debt levels to decline. Figure 2c shows the strong correlation observed between IRGD and change in general government debt. Since this inequality reduces the fiscal costs of a debt rollover (Blanchard 2019), it expands the scope for fiscal policy to (i) cater to slowdowns in aggregate demand and (ii) thereby enable growth to foster debt sustainability.

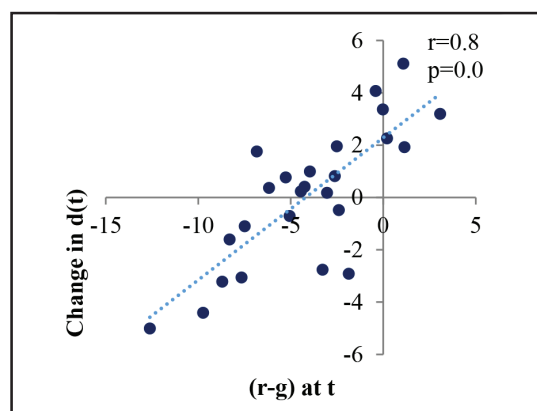
**2a: During the Last 25 years,  $i > \gamma$  is a Norm, Except for a Short Period During the Asian Financial Crisis**



**2b: Trends in real growth rate (g) and change in debt-to-GDP ratio (d)**



**2c: Strong correlation between (r-g) and change in debt to GDP ratio**



Source: RBI, MoSPI

Note:  $d(t)$  - General Government Debt as a per cent of GDP at time period (t), Debt for 2018-19 is RE and 2019-20 is BE.

Years represented in the figures are FY ending.

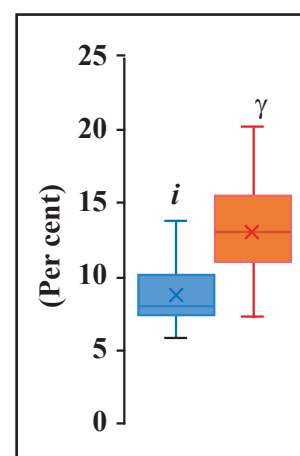
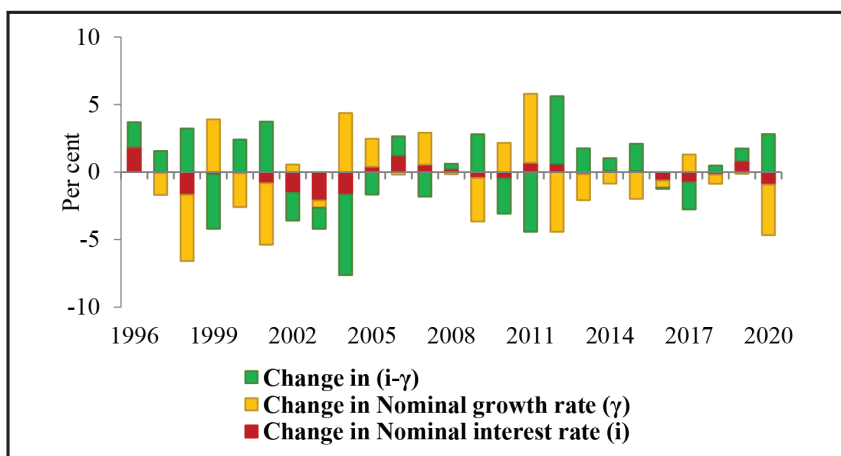
Nominal interest rate is the weighted average interest rate on Central Govt securities, Real interest rate is calculated using the Nominal interest rate and GDP deflator

2.7 A closer look at the trends in interest rate and growth rate in India highlights a perceptibly higher variability in the growth rates relative to interest rates over the past two-and-a-half decades (Figure 3a). This implies that changes in IRGD are mostly attributable to changes in growth rates rather than the changes in interest rates (Figure 3b, 3c, 3d). Thus, it is a higher growth that provides the key to the sustainability of debt for India (Figure 2 b).

**Figure 3: Change in GDP growth rate ( $\gamma$ ) explains most of the variation in Interest Rate Growth Differential ( $i-\gamma$ ) during last 25 years (FY1996 to FY2020)**

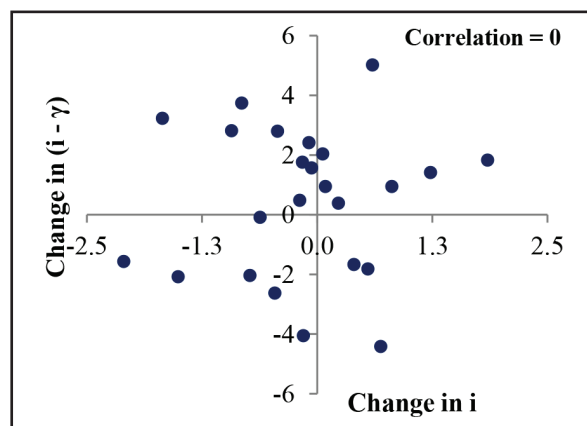
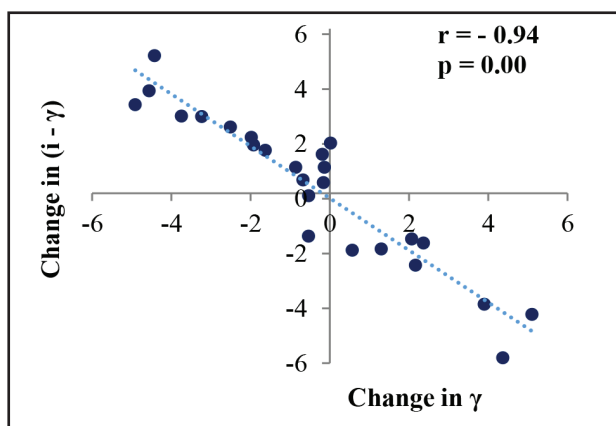
**Figure 3a: Decomposition of variation in ( $i-\gamma$ )**

**Figure 3b: Variability in  $i$  and  $\gamma$**



**Figure 3c : Strong correlation between variation in  $\gamma$  and variation in ( $i-\gamma$ )**

**Figure 3d : No correlation between variation in  $i$  and variation in ( $i-\gamma$ )**



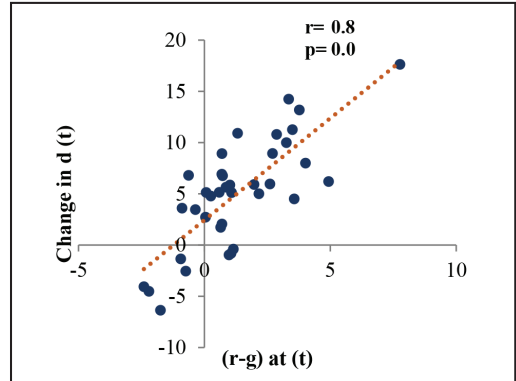
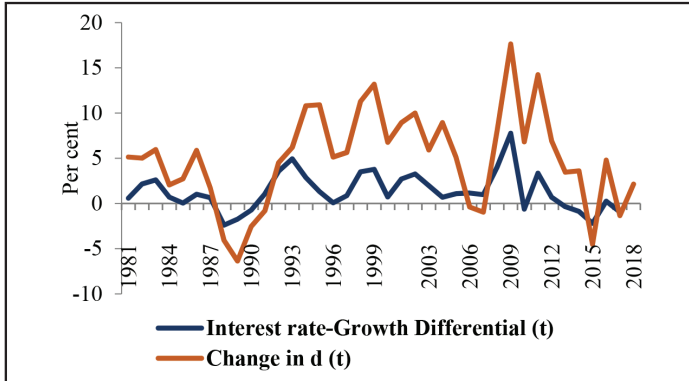
Source: RBI, MoSPI

## THE IRGD AND DEBT SUSTAINABILITY FOR OTHER ECONOMIES

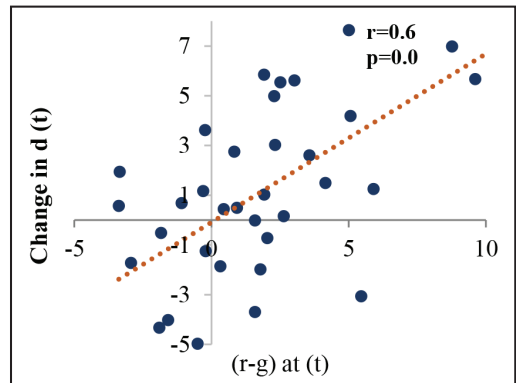
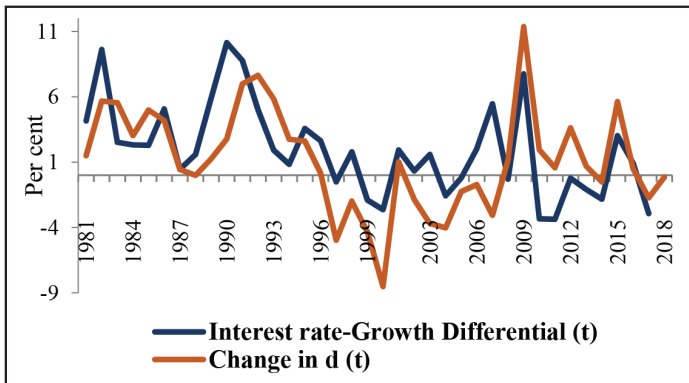
2.8 Similar to the Indian experience, a strong correlation between IRGD and incremental debt-to-GDP ratio is seen for other countries (Figure 4). It may be seen from the Figures that the years that correspond to negative IRGD are accompanied by a steeper decline in debt levels across the countries.

**Figure 4: Relationship between IRGD (r-g) and Change in Government debt-to-GDP (d) across countries**

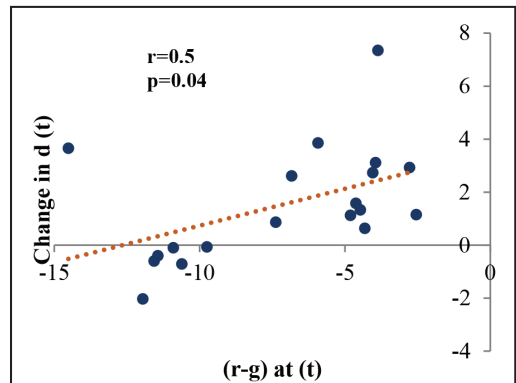
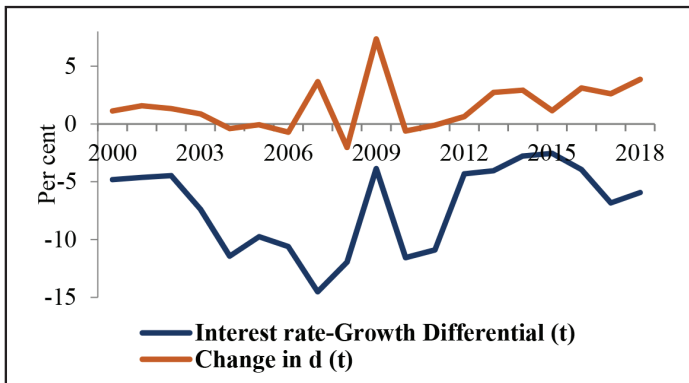
*Japan*



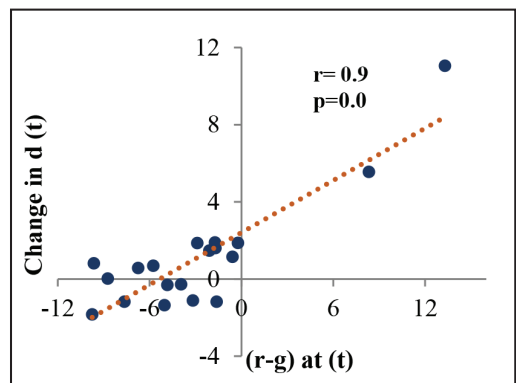
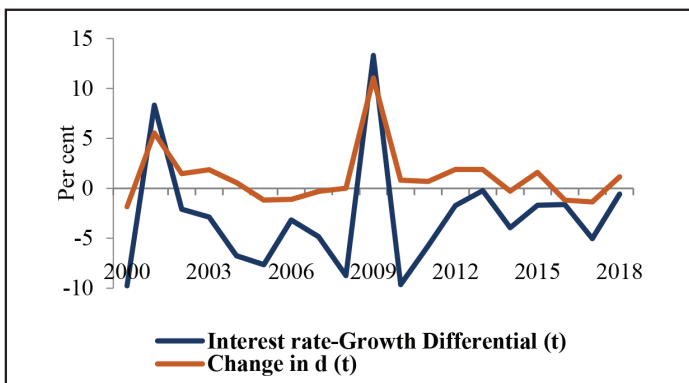
*Canada*



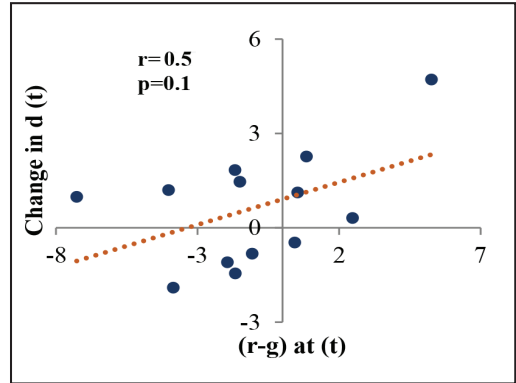
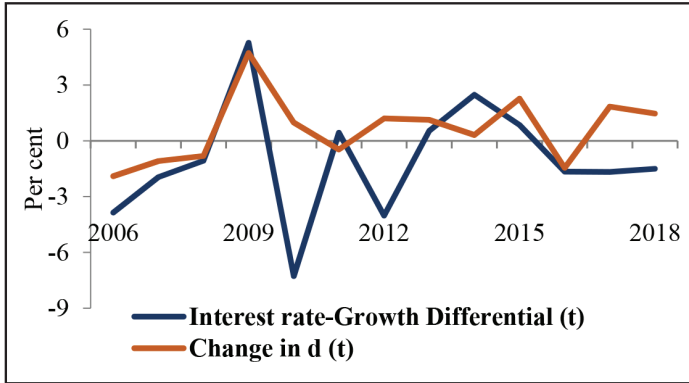
*China*



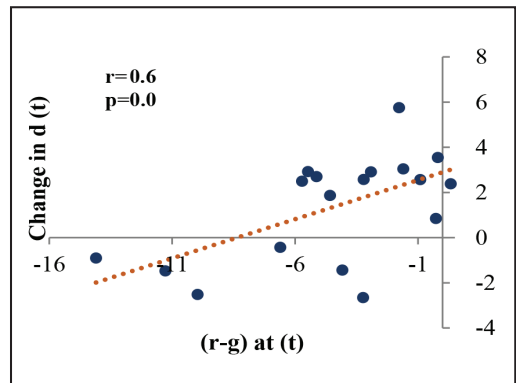
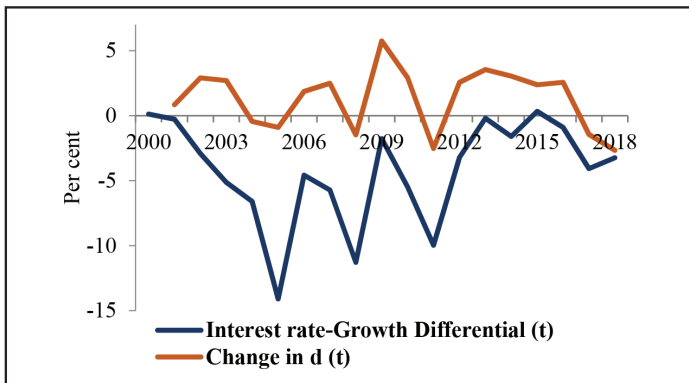
*Malaysia*



**Thailand**



**Vietnam**



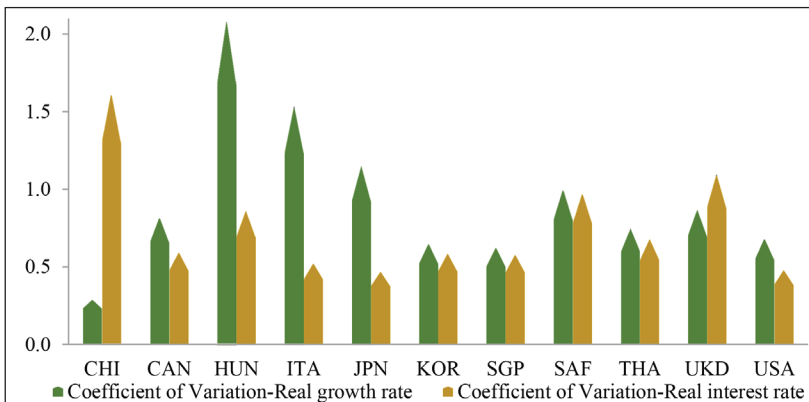
Source: IMF World Bank

Notes: d: Change in General Government Debt as a per cent of GDP r: Real interest rate; g: Real growth rate  
 The data for EMEs is taken starting from the year 2000 due to data constraint.  
 Data for Thailand is available from 2006.

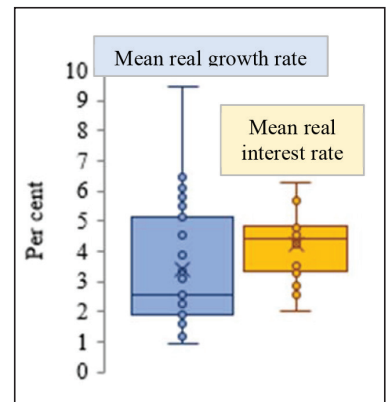
2.9 Cross country evidence also suggests that, within countries, growth rates vary far more across time than interest rates (Figure 5a). In fact, a higher variability is observed in mean growth rates

**Figure 5: Variation in g vis-à-vis variation in r (1980 – 2018)**

**5a. Variation in growth rates and interest rates within countries**



**5b. Variation in average growth rate and average interest rate across countries**



Time period: 1980 to 2018

Source: IMF, World bank

Countries such as Brazil, France, Germany have not been included due to non-availability of data on real interest rate in World Bank data portal; the panel is unbalanced.

across countries relative to the variation in average interest rates (Figure 5b). Thus, when taken together, both the within-country and across-country variation clearly imply that the variability in IRGD depends primarily on variation in  $g$ . Thus it is important to examine the dynamics of debt sustainability for high growth economies separately from that for low growth ones.

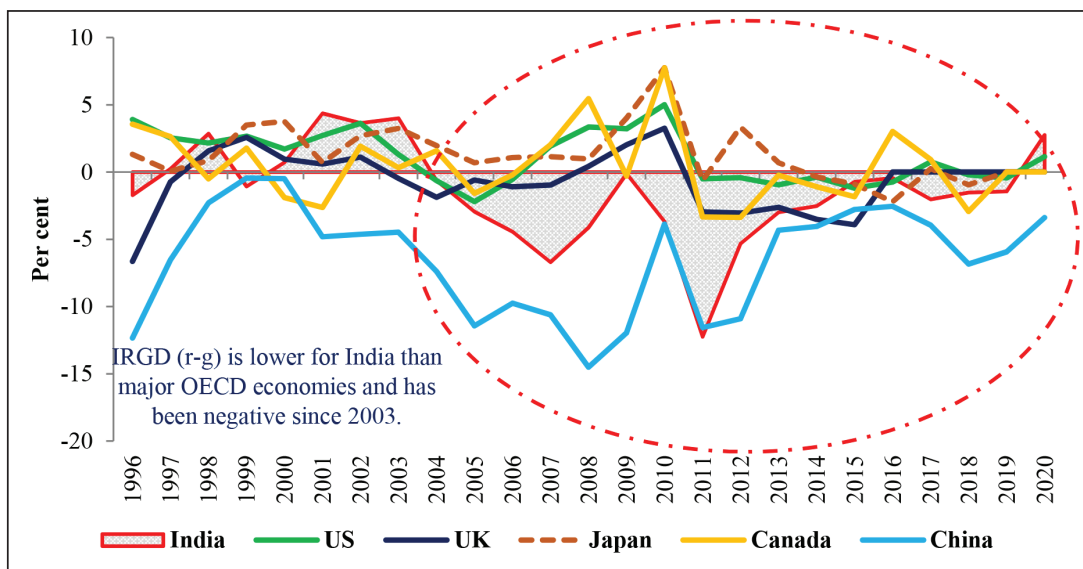
2.10 On analyzing the averages of real interest rate, real growth rates and IRGD for the period 1990-2018 across selected emerging and advanced economies, it can be seen that India – as one of the high growth economies – is amongst the countries having negative average IRGD, along with other countries such as China, Russia and Singapore (Table 1). This can also be seen from Figure 6 which shows that since 2003, India's IRGD has been negative and the lowest for the major OECD economies.

**Table 1: Averages and Variability of Real Interest Rates, Real Growth Rates and IRGD for the Period 1990-2018**

	r			g			r-g		
	Average	Median	SD	Average	Median	SD	Average	Median	SD
Canada	3.3	3.4	2.2	2.3	2.7	1.8	1.0	0.8	3.2
China	1.9	2.4	3.5	9.6	9.4	2.3	-7.8	-6.7	5.2
India	2.6	2.8	2.6	6.5	6.6	2.1	-3.9	-3.6	3.5
Indonesia	5.2	6.5	7.6	5.0	5.4	3.9	0.1	1.2	5.7
Italy	4.8	3.8	2.5	0.7	1.3	1.8	4.1	3.0	2.9
Japan	2.7	2.9	1.4	1.0	1.2	1.8	1.7	1.1	2.1
Russia	0.2	-0.3	9.2	1.0	2.2	6.5	-3.2	-4.6	13.0
Singapore	4.3	4.3	2.4	5.9	6.0	3.8	-1.6	-1.9	5.4
UK	1.9	1.8	2.8	2.0	2.4	1.7	-0.1	-0.1	2.9
US	3.7	3.1	2.0	2.5	2.8	1.6	1.2	0.8	2.0

Source: IMF, RBI, World Bank (SD-Standard Deviation)

**Figure 6: Comparison of IRGD for India with other countries over the last 25 years**



Source: IMF, RBI, World Bank

## IN INDIA, GROWTH LEADS TO DEBT SUSTAINABILITY, NOT VICE-VERSA

2.11 How does the consistently negative IRGD affect the relationship between debt and growth in India? Does higher growth lead to lower debt or lower debt cause higher growth? Conceptually, causality could flow in either direction. The argument supporting higher debt leading to lower growth is as follows: higher levels of public debt are accompanied by more taxes in the future to pay for the debt, thereby leading to lower lifetime wealth, which may decrease consumption and savings, eventually resulting in lower aggregate demand and growth rates. If higher public debt (i.e. lower public savings) is not accompanied by increase in private savings, it may also lead to lower total savings in the economy. This may put upward pressure on the interest rates, resulting in crowding out of investment and thus negatively impacting the growth rates. On the other hand, as described in Box 3, higher GDP growth leads to lower public debt through the increase in the denominator, i.e. GDP.

### Box 4: The Modigliani-Miller theorem, Principles of Corporate Finance and Sovereign Debt

“As others have done before, one can think of countries as corporations. While obviously highly reductive, consolidating all agents in a country into a single representative decision-maker has the advantage of bringing out in a simple way the economic objectives of a nation and the constraints that it faces, *in particular its financial constraints*. The drawback, as with corporations, is that the consolidation buries all inside agency and governance issues.” (emphasis added)

– Patrick Bolton, Presidential Address to the American Finance Association titled “Debt and Money: Financial Constraints and Sovereign Finance”, 2016

Before the Global financial crisis, macroeconomics largely ignored the role of finance and the financial sector. However, recent macroeconomic research incorporates the role of finance in the macro-economy. So, to think carefully and clearly about a country’s fiscal policy and how the same can impact its investment policy, a corporate finance perspective *a la* Patrick Bolton (2016)’s presidential address at the American Finance Association is useful. The study postulates that fiat money in a country resembles the equity in a corporation because a Rupee of fiat money enables the owner to lay a one Rupee claim on the country’s output just like a share of common stock entitles the holder to a pro-rata share of residual cash flows of a firm; higher the fiat currency owned by a citizen, greater the claims that the citizen can lay on the country’s output. By drawing this clever parallel, Bolton (2016) employs the principles of corporate finance to theoretically model the choice of sovereign debt for a country.

To think about sovereign debt in this framework, it is useful to start with the Modigliani-Miller theorem (Modigliani and Miller, 1958), which provides the conceptual bedrock for thinking about debt and capital structure. The theorem posits that, under certain ideal conditions described below, the amount of debt or the capital structure of a firm (or a sovereign by extension) is irrelevant. The theorem employs the concept of “homemade leverage” to arrive at this important conclusion. Homemade leverage is a financial concept that holds that as long as investors can borrow on the same terms as a firm, which prevails only under ideal conditions, they can artificially duplicate the effects of corporate leverage by creating their own homemade leverage to either nullify or duplicate any debt-equity choice made by the firm. Therefore, under ideal conditions, investors



would not care between investing in a firm having zero debt and one that chooses to have debt in its capital structure. Similarly, under ideal conditions, the investors in a country, which includes the citizens as equity holders via holders of fiat money, would not care about the amount of debt raised by the country.

As with most theories, the practical utility of the Modigliani-Miller theorem arises from understanding the precise set of conditions that lead to its failure, specifically from the ways in which the postulated ideal conditions get violated in practice. In fact, as Miller (1988) reviewed, “showing what *doesn't* matter can also show, by implication, what *does*.” (emphasis in original) Relaxing the assumptions that lead to the ideal conditions enables us to understand what practical considerations do impact capital structure. These are absence of taxes, bankruptcy costs, agency problems or asymmetric information and the presence of complete markets in the Arrow-Debrew formulation. If all these assumptions hold, then investors/citizens can borrow on the same terms as a firm/ sovereign.

In developing economies such as India, the presumption that citizens can borrow on the same terms as the sovereign gets violated sharply because of the combination of bankruptcy costs and asymmetric information, which in turn result in lack of access to credit markets for large sections of the population. In developing economies such as India, the wedge between the cost of borrowing for the sovereign and the cost to an average (common) citizen is much higher than in developed economies. This wedge includes the costs faced by the average citizen on both the intrinsic and extrinsic margins, i.e. the interest rate paid conditional on being able to borrow and the cost from being credit rationed respectively. Therefore, the application of the homemade leverage argument leads to the inference that fiscal multipliers would be significantly higher in a developing economy such as India than in developed economies.

The Bolton (2016) analysis also highlights the importance of fiscal policy to fund capital investment, especially during periods of economic crisis. The literature in corporate finance highlights that financing constraints impact investment materially. As financing constraints faced by the private sector get significantly exacerbated during an economic crisis, the role of the sovereign in using fiscal policy to foster investment becomes particularly salient in a crisis. As Bolton (2016) notes “If there is one deep, general, lesson from the global financial crisis of 2007-09, it is that financial constraints matter: they bite a little most of the time, a lot some of the time (and they are deadly in extreme crises). What is more, when they bite a lot the stagnation they engender persists for long stretches of time... So, what makes corporate finance relevant is the universal presence of financial constraints. At the margin, most economic decisions are affected by financial constraints. Understanding these constraints, therefore, helps us better understand economic decision-making. And understanding how to relax financial constraints helps us achieve more efficient resource allocation.” Financial constraints faced by the private sector – including firms and households – are particularly biting during periods of economic crisis and when they bite a lot the stagnation they engender persists for long stretches of time. Therefore, the wedge between the costs of borrowing for the sovereign and that for the citizens, including corporate citizens, is disproportionately larger during periods of economic crisis.

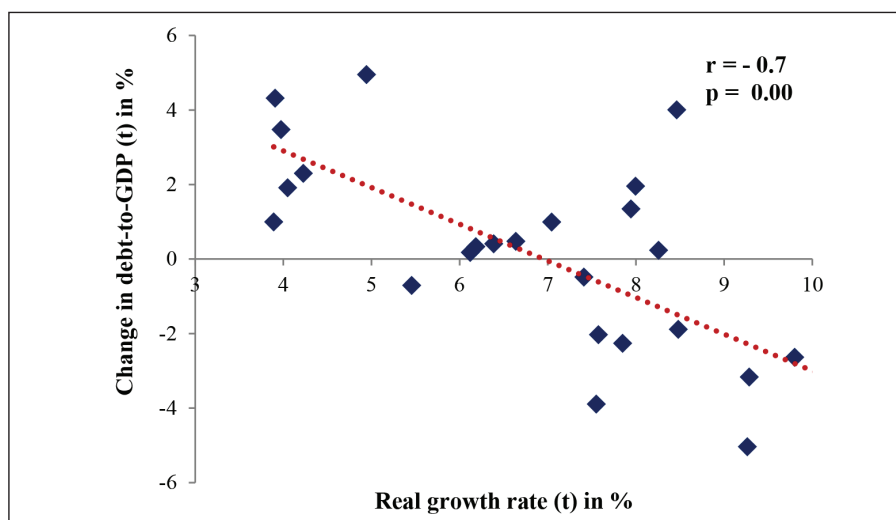
Bolton (2016)'s analysis highlights potential inflation as the primary cost of raising debt in the domestic currency. A domestic-currency sovereign bond is, in effect, a pay-in-kind note

because the bond has to be repaid using fiat domestic currency, which is in turn a claim on the nation's output. Therefore, debt denominated in the domestic currency is in effect a claim on the nation's (future) output. Seen this way, an interesting parallel arises between the costs of dilution from fresh equity issuance and costs due to inflation, which essentially dilutes the value of future output, when more money is printed. Incumbent equity holders in a company see their ownership diluted when the company issues stock to new equity holders at a price below its intrinsic value. This, however, does not mean that any stock issue necessarily involves dilution of value for incumbent equity holders. As Stein (1996) and Baker, Stein and Wurgler (2003) have argued, corporations can also be in situations where they are able to issue new shares when the company's share is overvalued. In such situations, the equity issue, in effect, results in more valuable ownership for incumbent shareholders. Similarly, printing more money can result in inflation and loss of purchasing power for domestic residents if the increase in money supply is larger than the increase in output. However, as with new stock issues and dilution, printing more money does not necessarily lead to inflation and a debasement of the currency. In fact, if the increased money supply creates a disproportionate increase in output because the money is invested to finance investment projects with positive net present value (where such value incorporates all the societal value generated by the investment), the increased money supply is beneficial to the citizens.

2.12 Evidence over the last two-and-a-half decades demonstrates clearly that in India, higher GDP growth causes the ratio of debt-to-GDP to decline but not vice-versa. An examination of the contemporaneous correlation between real GDP growth and ratio of general government debt-to-GDP – though clearly negative and statistically significant as seen in Figure 7 – does not provide clarity about the direction of causation.

2.13 Inferring the direction of causation that manifests in India is important because the negative contemporaneous correlation seen in Figure 7 can be incorrectly interpreted as higher debt causes the GDP growth rate to decline, when it is possible that the direction of causation is exactly the opposite – higher GDP growth rate causes the debt as a percentage of GDP to decline.

**Figure 7: Contemporaneous relationship GDP growth and change in general government debt for India (FY 1996 to FY 2020)**

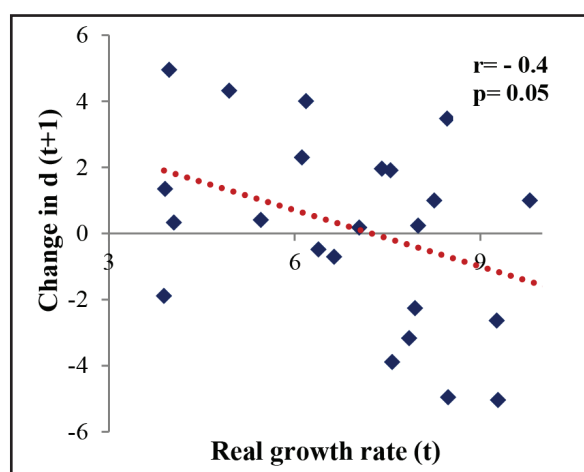


Source: RBI, MoSPI

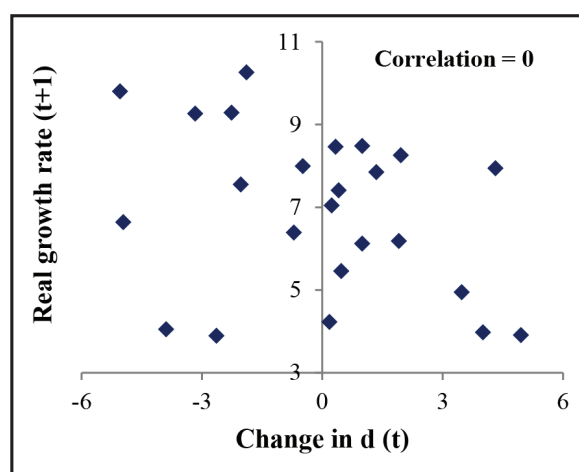
2.14 To infer the direction of causation, we examine the differences in their lagged correlations. Figure 8 demonstrates the lagged relationship between real GDP growth rates and change in general government debt-to-GDP levels over the last 25 years. Over the last two-and-a-half decades, real GDP growth rates and one-year-ahead change in general government debt-to-GDP levels show a significant negative correlation. However, during the same time period, the correlation between change in general government debt-to-GDP levels and one-year-ahead growth rates turns out to be statistically indistinguishable from 0. The evidence therefore shows the direction of causality between the two variables: higher growth leads to lower public debt in India, but not vice-versa.

**Figure 8: Direction of causality between growth and change in GG debt for India (FY 1996 to FY 2020)**

**Figure 8a: Growth → Debt : Correlation between g and 1 year ahead  $\Delta d$**



**Figure 8b: Debt → Growth : Correlation between  $\Delta d$  and 1 year ahead g**



Source: RBI, MoSPI

Note: d-General Government Debt-to-GDP ratio (per cent)

GDP 2011-12 series used

Debt used for 2018-19 is RE and 2019-20 is BE

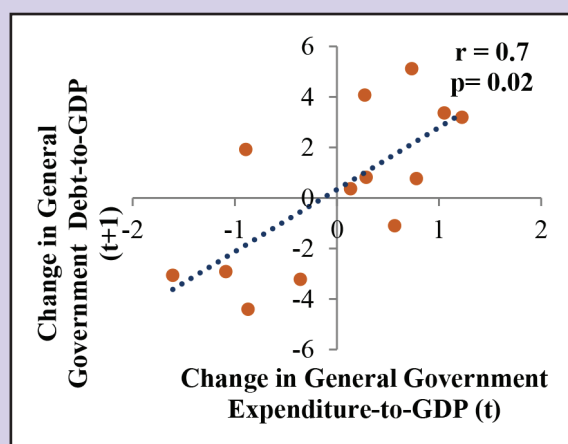
### Box 5: Debt Sustainability through higher growth following the Asian Financial Crisis

Across economic crises over the last century, fiscal policy has been a prominent savior to bring back economic growth. For the past three decades, the Indian economic story has been characterized by long spells of high GDP growth. Fiscal policy has been a key determinant of growth acceleration after an exogenous global shock led to a decline in growth. Consider the shock due to the Asian Financial Crisis (1997-98). During the period 1997-98 to 2002-03, growth slowed down to an average of 5.3 per cent in real terms. Despite a fall in growth levels, an expansionary fiscal policy that focused on infrastructure spending was adopted by the Government<sup>1</sup>

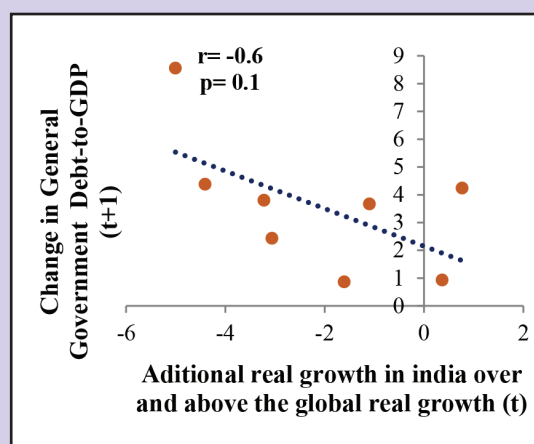
<sup>1</sup> This was combined with several reform measures that helped enhance productivity. Martin, Natarajan and Harrison 2017 show that removal of small scale reservations during early 2000s encouraged the overall employment growth and productivity of firms which were earlier constrained by the size restrictions. On the other hand, the policy direction following the Global Financial Crisis was in stark contrast to that following the Asian Financial crisis. While fiscal spending was stepped up after the GFC, the quality of spending remained poor. Moreover, absence of reforms exacerbated the poor quality fiscal spend. (Bajpai, 2011)

Government expenditure increased consistently during these years, which led to general government debt reaching record levels. This fiscal push imparted the necessary impetus required for the growth to take off and average 8 per cent in real terms over the next six years from 2003-04 to 2008-09. High growth in this period brought debt down from the record high levels of 83 per cent of GDP attained in 2003-04 to around 70 per cent of GDP in 2009-10 (Figure 9a and 9b). This episode highlights that public debt – when productively streamlined – can enable the economy to reach a higher growth trajectory and, in turn, ensure debt sustainability.

**Figure 9a: Debt-to-GDP ratio increased to historically high levels during FY 1996- FY 2006 due to greater spending: Strong positive correlation between change in fiscal spending and 1 year ahead change in debt-to-GDP levels.**



**Figure 9b: Debt-to-GDP ratio declined due to higher growth that resulted from FY 2003 to FY 2011: Negative correlation between additional real growth of India over and above the global real growth and 1 year ahead change in debt-to-GDP levels.**



Source: IMF, MoSPI, RBI

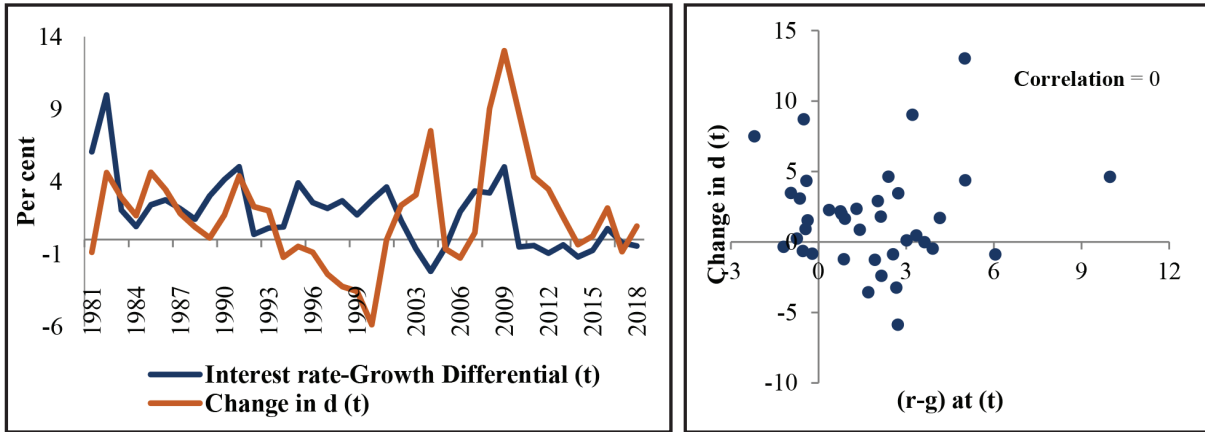
## DIRECTION OF CAUSALITY IN OTHER ECONOMIES

2.15 Is India an outlier, where higher growth rates lead to lower public debt but not vice-versa? The confusion about the direction of causality – from growth to debt sustainability or vice-versa – possibly stems from the fact that the academic and policy literature focuses primarily on advanced economies, where the direction of causality may be entangled by lower potential growth when compared to a high-growth economy such as India.

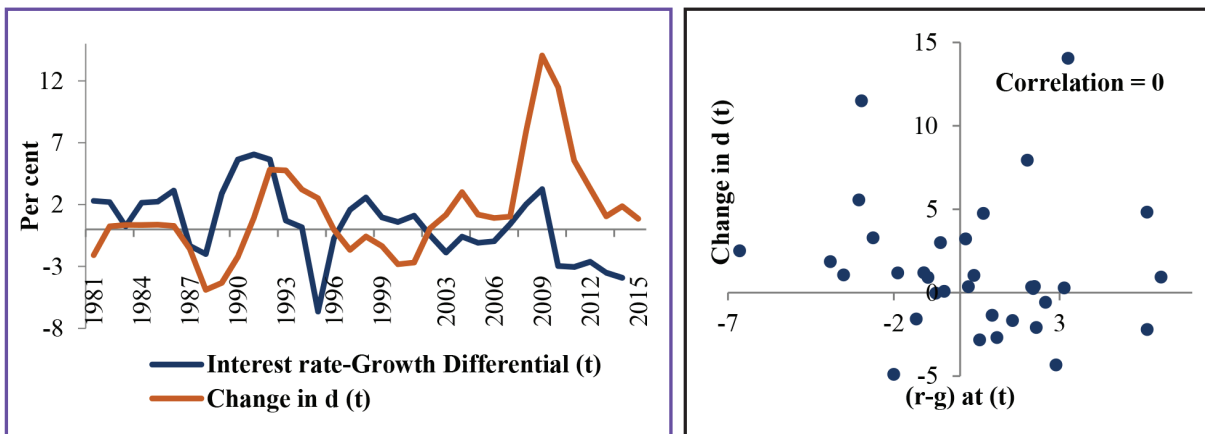
2.16 On examining the trends in IRGD and change in debt-to-GDP ratio for low growth economies like US and UK in Figure 10, no correlation is observed between the two variables. This indicates lack of evidence for direction of causality from real growth rate to government debt-to-GDP these countries.

**Figure 10: No correlation between IRGD and change in debt-to-GDP ratio for US and UK**

**10(a): US**



**10(b): UK**



Source: IMF, World Bank

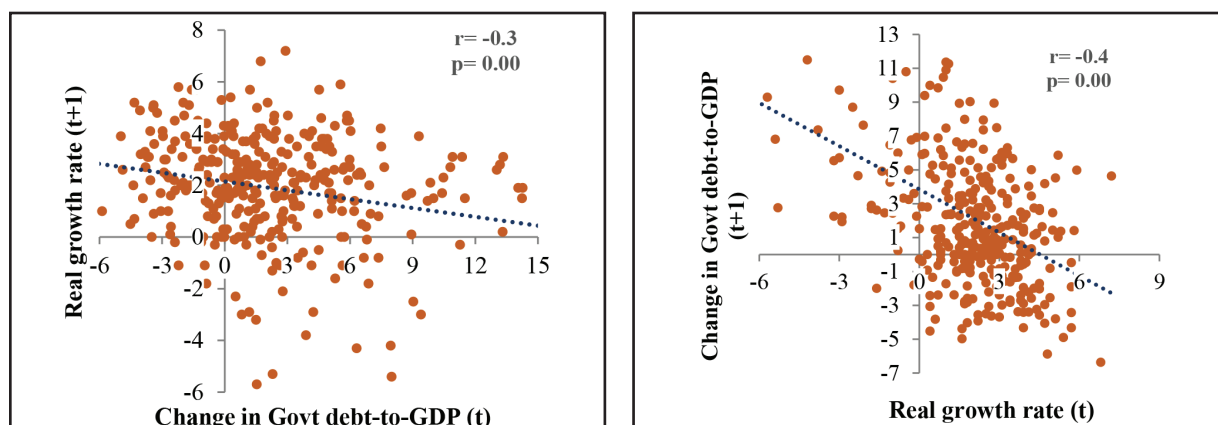
Notes: d: Change in General Government Debt as a per cent of GDP

r: Real interest rate; g: Real growth rate

Data on real interest for UK available upto 2014 with WB Data portal

2.17 Figure 11a shows the same time-series correlations as estimated for India above for the advanced economies – Canada, France, Germany, Greece, Italy, Spain, Japan, US and UK. These correlations are estimated by pooling the data for these countries over the last four decades. We notice that the correlation between real GDP growth rates and one-year-ahead change in general government debt-to-GDP levels is significantly negative. Similarly, the correlation between change in general government debt-to-GDP levels and one-year-ahead growth rates is also negative and statistically significant. Thus, unlike in the case of India, the time-series correlations do not suggest the direction of causality as both sets of correlations are statistically significant. This difference is extremely important to highlight because the implications for fiscal policy – especially during the current crisis – are starkly different for India when compared to policies that mimic those followed by advanced economies.

**Figure 11a: Unlike India, direction of causality between growth and debt cannot be inferred for the advanced economies**

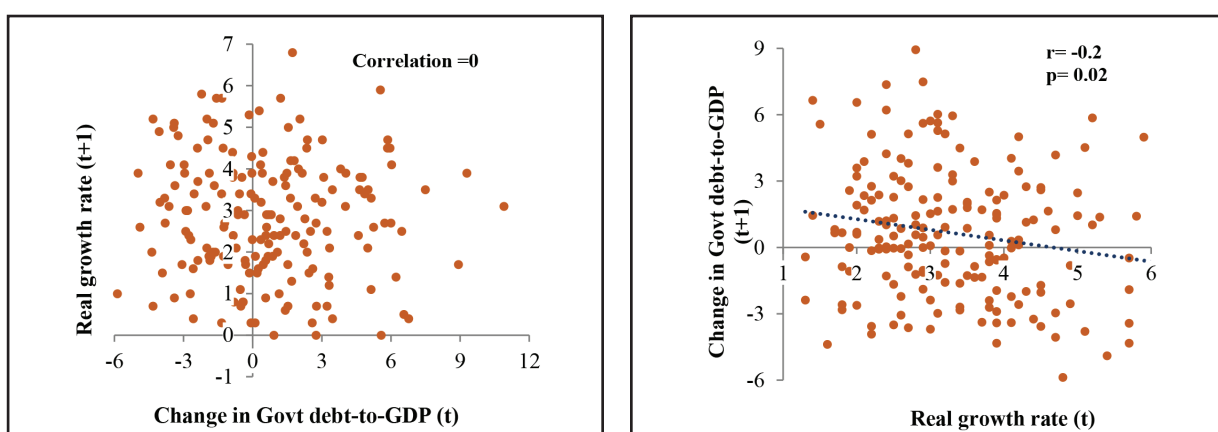


Data on General Government that has been used. Countries include Canada, France, Germany, Greece, Italy, Spain, UK, USA, Japan

Source: IMF

2.18 However, when the above time-series correlations for the advanced economies is restricted to the high growth phases over the last two decades, i.e. growth greater than the average growth for the country over 1980-2018, the result is identical to that obtained for India. Specifically, higher growth leads to lower debt-to-GDP but not vice versa (Figure 11b). Of course, we see that the correlation from higher growth leads to lower debt-to-GDP is not very high, even though it is statistically significant, because the growth rates are not very high even during the high growth episodes in advanced economies. The inference remain clear that, even in the advanced economies where GDP growth has been significantly lower than that in a high growth country such as India, high growth phases lead to lowering of debt.

**Figure 11b: Direction of causality: Growth to Debt in high growth phases in advanced economies**



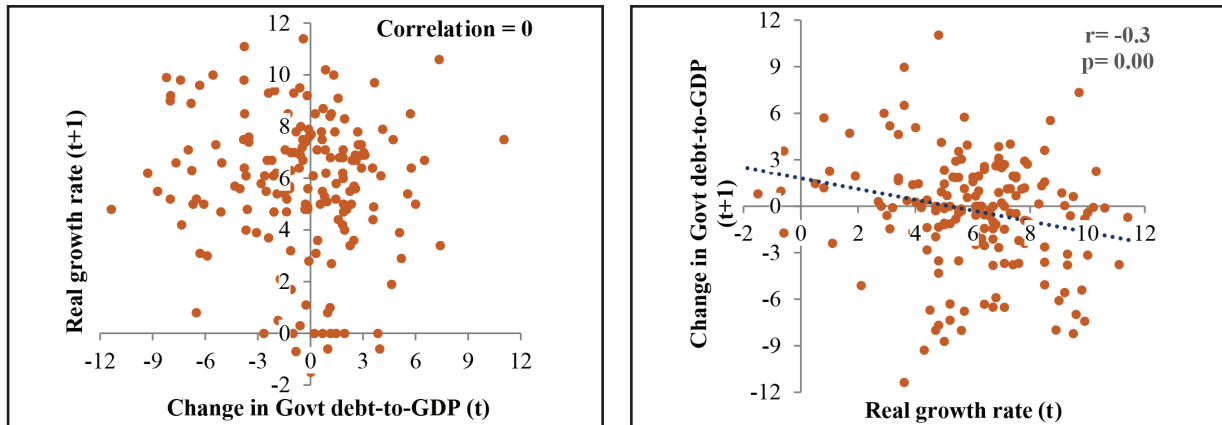
Data on General Government that has been used. Countries include Canada, France, Germany, Greece, Italy, Spain, UK, USA, Japan

Source: IMF



2.19 The evidence that the magnitude of GDP growth affects the direction of causality from growth to debt sustainability is buttressed by the evidence of this causal relationship for the all high growth EMEs put together, which include India, China, Indonesia, Malaysia, Thailand, Philippines, Vietnam and Turkey. Figure 12 shows that higher growth leads to lower debt-to-GDP ratios over the period 1980 to 2018 but not *vice versa*. This may be inferred from the statistically significant negative correlation observed between real growth rate and 1-year ahead change in general government debt-to-GDP, and statistically insignificant correlation between change in debt-to-GDP and one year ahead real growth rate.

**Figure 12: Direction of causality: Growth to Debt in high growth EMEs**



Data on General Government that has been used. Countries include India, China, Indonesia, Malaysia, Thailand, Philippines, Vietnam, Turkey

Based on availability of General Government debt data on IMF Debt database. The panel is unbalanced.

2.20 Thus, the evidence clearly points out that for countries growing their GDP at high rates, growth leads to lowering of their public debt as measured by their debt-to-GDP ratios but not vice versa. In contrast, when the GDP growth rate is low, no such causal relationship manifests between growth and public debt. This is seen through the following summary of the results demonstrated so far.

- For India and other EMEs, which have consistently grown their GDP at high rates over the last few decades, the relationship between debt and growth exhibits a clear direction of causality: Higher growth lowers debt-to-GDP ratios but lower debt does not necessarily lead to higher growth.
- The same phenomenon is obtained during the high growth phases for the advanced economies, which have otherwise grown at significantly lower GDP growth rates when compared to India and other EMEs.
- In contrast, across both the high and low growth episodes, in the advanced economies, where GDP growth rates have been low on average over the last few decades, this relationship does not manifest.
- A Granger causality test of this relationship for panel of advanced countries and EMEs including India, shows that while real GDP growth rate causes general government debt-to-GDP in EMEs, this relationship is not clearly seen in the advanced countries (see Box 6).

## Box 6: CAUSALITY TESTS ON PANEL DATA OF EMEs AND ADVANCED ECONOMIES

To confirm the direction of causality using formal statistical tests, pairwise Dumitrescu Hurlin Panel Causality Test was carried for the sample of EMEs and advanced economies. The test allows the coefficients to be different across countries. This test simply runs standard Granger Causality regressions for each cross-section individually. The lag order is assumed to be identical for all countries.

The test finds evidence of causality from Growth to Debt for the sample of EMEs. However, for the sample of Advanced countries, the test is not able to establish any causal relationship between Change in debt-to-GDP and growth.

<b>Sample 1- Emerging market Economies</b>	<b>Sample 2- Advanced economies</b>																								
Time period: 1981-2018 (Unbalanced)	Time period: 1981-2018																								
Countries: India, China, Indonesia, Malaysia, Thailand, Philippines, Vietnam, Turkey.	Countries: Canada, France, Germany, Greece, Italy, Spain, UK, USA, Japan																								
$H_0$ : Real growth rate does not cause Change in Debt/GDP for all cross sections.	$H_0$ : Real growth rate does not cause Change in Debt/GDP for all cross sections.																								
<b>Rejected at 5% level of significance</b>	<b>Not rejected.</b>																								
$H_0$ : Change in Debt/GDP does not cause Real growth rate for all cross sections.	$H_0$ : Change in Debt/GDP does not cause Real growth rate for all cross sections.																								
<b>Not rejected</b>	<b>Not rejected.</b>																								
<small>Pairwise Dumitrescu Hurlin Panel Causality Tests Date: 10/13/20 Time: 18:57 Sample: 1981 2018 Lags: 2</small>	<small>Pairwise Dumitrescu Hurlin Panel Causality Tests Date: 10/13/20 Time: 18:49 Sample: 1981 2018 Lags: 2</small>																								
<table border="1" style="width: 100%; border-collapse: collapse; font-size: small;"> <thead> <tr> <th style="text-align: left;">Null Hypothesis:</th> <th style="text-align: center;">W-Stat.</th> <th style="text-align: center;">Zbar-Stat.</th> <th style="text-align: center;">Prob.</th> </tr> </thead> <tbody> <tr> <td>REALG does not homogeneously cause DELD</td> <td style="text-align: center;">6.27806</td> <td style="text-align: center;">3.47867</td> <td style="text-align: center;">0.0005</td> </tr> <tr> <td>DELD does not homogeneously cause REALG</td> <td style="text-align: center;">1.86009</td> <td style="text-align: center;">-0.48300</td> <td style="text-align: center;">0.6291</td> </tr> </tbody> </table>	Null Hypothesis:	W-Stat.	Zbar-Stat.	Prob.	REALG does not homogeneously cause DELD	6.27806	3.47867	0.0005	DELD does not homogeneously cause REALG	1.86009	-0.48300	0.6291	<table border="1" style="width: 100%; border-collapse: collapse; font-size: small;"> <thead> <tr> <th style="text-align: left;">Null Hypothesis:</th> <th style="text-align: center;">W-Stat.</th> <th style="text-align: center;">Zbar-Stat.</th> <th style="text-align: center;">Prob.</th> </tr> </thead> <tbody> <tr> <td>REALG does not homogeneously cause DELD</td> <td style="text-align: center;">2.98952</td> <td style="text-align: center;">1.11521</td> <td style="text-align: center;">0.2648</td> </tr> <tr> <td>DELD does not homogeneously cause REALG</td> <td style="text-align: center;">1.88412</td> <td style="text-align: center;">-0.33238</td> <td style="text-align: center;">0.7396</td> </tr> </tbody> </table>	Null Hypothesis:	W-Stat.	Zbar-Stat.	Prob.	REALG does not homogeneously cause DELD	2.98952	1.11521	0.2648	DELD does not homogeneously cause REALG	1.88412	-0.33238	0.7396
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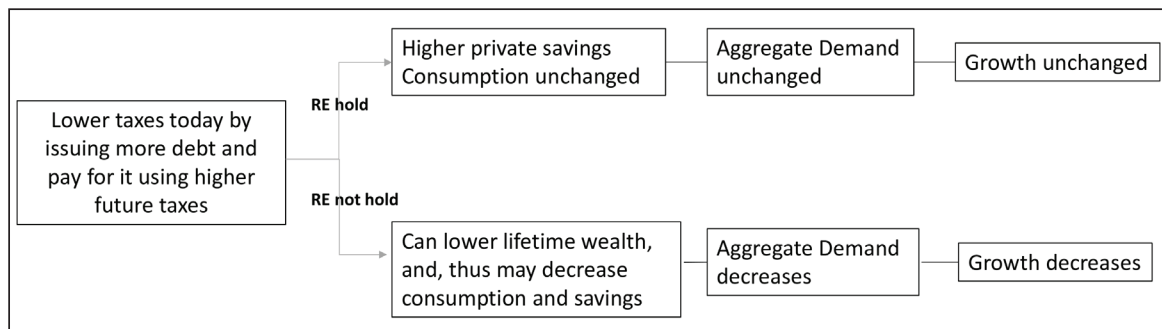
Data source: IMF

## CROWDING OUT DUE TO PUBLIC EXPENDITURE?

2.21 So far, we have established a clear direction of causality between growth and debt for countries where the growth rates are high; specifically, growth leads to debt sustainability and not vice versa in these countries. This direction of causality is, however, not clear in the case of countries where the growth rate is low. This is because higher growth enables the IRGD to be negative and thereby ensuring debt sustainability. We now examine the potential mechanisms that explain behind the causal effect from growth to debt sustainability and not vice versa for India.

2.22 Conceptually, the plausible link from higher incremental debt to lower growth rate is based on potential crowding out of private investment and the Ricardian Equivalence Proposition (REP). REP states that forward-looking consumers, who are also assumed to be

perfectly rational and perfectly capable, internalize the government's fiscal choices when making their consumption decisions. Specifically, for a given pattern of government spending, increases in government spending (or lowering of taxes) in the current period lead forward-looking consumers to anticipate future tax increases, thereby leading them to save in the current period to be able to pay for the future tax increases. As a result, aggregate demand remains unchanged in the current period (Barro, 1974, 1979). REP, however, breaks down in most economies because of the failure of the stringent assumptions – including lump-sum taxes – that are required for it to hold. When REP does not hold, for instance due to proportional taxes, higher public debt levels (lower public savings) may not be accompanied by increase in private savings, higher government spending (or lower taxes) in the current period may lead to lower national savings. This may put upward pressure on the interest rates, resulting in crowding out of investment and thus negatively impacting the growth rates. This section examines these mechanisms for India.



## Crowding Out?

2.23 The phenomenon of crowding out of private investment is based on the notion that supply of savings in the economy is fixed. Therefore, higher fiscal spending may increase the demand for loanable funds and hence exert an upward pressure on interest rates, thereby discouraging private investment (Blanchard, 2008).

2.24 However, for emerging economies such as India, an increase in public expenditure in areas that boost private sector's propensities to save and invest, may enable private investment rather than crowding it out. In other words, in an economy that has unemployed resources, an increase in government spending increases the aggregate demand in the economy, which may induce the private sector to increase their investment in new machinery to cater to the increased demand, and hence put the unused resources to productive uses. This may have multiplier effects on aggregate demand, resulting in higher growth rates (Eisner, 1994). In fact, if the public expenditure is directed to sectors where the fiscal multipliers are large – for instance for building infrastructure – such spending may significantly crowd in private investment as well.

2.25 Recent research puts further doubt on the phenomenon of crowding out in rapidly growing economies by showing that the supply of savings is not fixed but expands with

income growth. Sandri (2014) examines 62 episodes of growth spurts from 1960 to 2011 among non-OECD countries and shows that productivity growth across these episodes is combined with not only a rapidly rising investment rate but an even more steeply increasing savings rate. Carroll and Weil (1994), Attanasio, Picci and Scorcu (2000) and Rodrik (2000) show that savings and growth are not only positively correlated but their positive correlation is even stronger than that between growth and investment. Using a VAR framework, Kulkarni and Erickson (1995) find no statistically significant evidence of crowding out in India. Due to dynamic interdependencies between public investment and GDP, the literature has also resorted to using vector auto-regressions (VARs) to estimate the crowding out phenomenon. Mitra (2005) uses a structural VAR, and finds evidence that the impact of public investment on crowding out of private investment is less than one for one. These results broadly support the static, unconditional estimates provided below.

2.26 For a country such as India with an extremely young population, the role of demographics in fostering savings becomes crucial to understand possible crowding out due to government spending. Bosworth and Chowdrow-Reich (2007) show for Asia that both savings and investment rise with the proportion of the working population. Curtis, Lugauer and Mark (2011) find that jobs that pay meaningful wages drive savings rate in the economy. Lee, Mason and Miller (2000) and Bloom et al. (2007) show that savings increases as average life expectancy increases in a country. Thus, in an economy operating below full capacity, the supply of savings may grow from greater government spending through demand creation and thereby greater employment. This is because, as highlighted by recent research, favourable demographics – in the form of a large population of working age – would enhance savings through meaningful jobs.

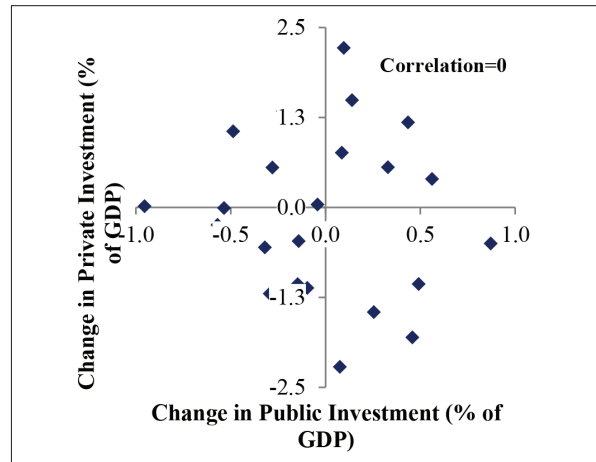
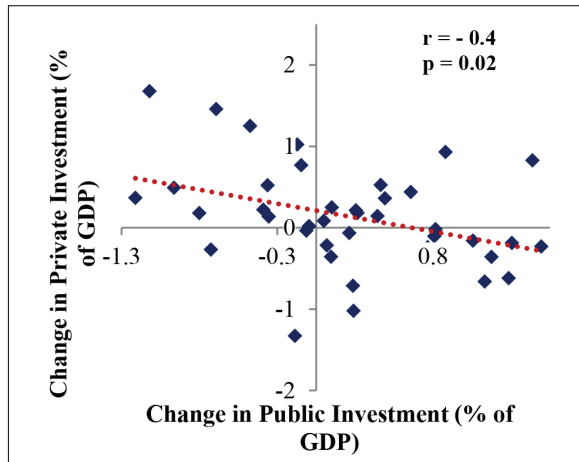
2.27 Consistent with these arguments against crowding out, studies find no evidence of crowding out of private investment due to public investment for developing economies. Erden and Holcombe (2005) analyse the public and private investment in developing and developed economies, and conclude that while public investment is complementary to private investment in developing countries, the opposite holds for developed countries. Eisner (1994) argues that whether an increase in Government expenditure for goods and services ‘crowds out’ domestic private investment, may depend upon how close the economy is to full employment. Bahal et al. (2015) find no evidence of crowding out in India over the period 1980-2012.

2.28 We analyse the relationship between changes in public investment and changes in private investment for the period FY 1991- FY 2019 and find the correlation to be insignificant (Figure 13b). Thus, consistent with the results in Bahal et al. (2015), we find no evidence of crowding out over the last three decades post liberalization. However, during the pre-liberalisation period of FY 1951-FY 1990, a negative correlation between changes in public investment and changes in private investment provides evidence consistent with the rationale of fixed loanable funds and possible crowding out (Figure 13a).

**Figure 13: Relationship between public investment and private investment**

**13a. FY 1951 to FY 1990**

**13b. FY 1991 to FY 2019**



Source: MosPI

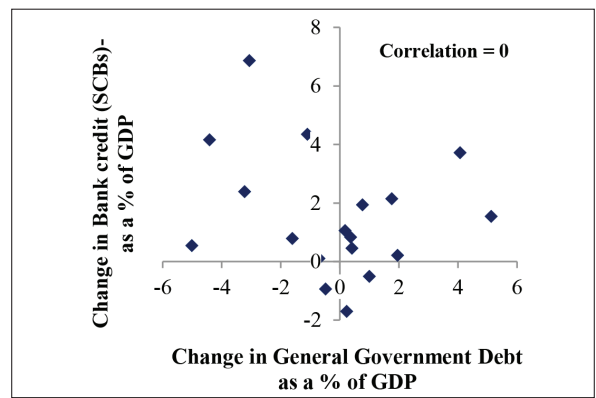
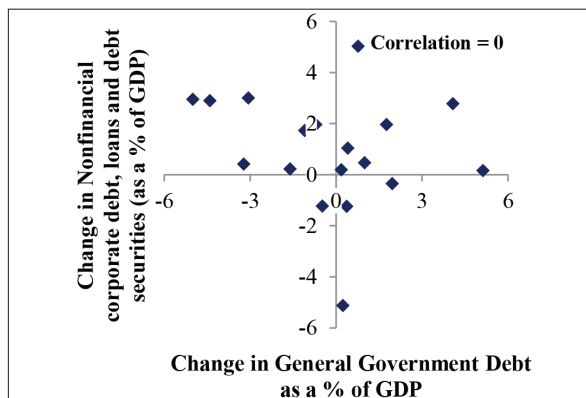
Investment and GDP upto FY2011 is 2004-05 series and from FY 2011 to FY 2019 is 2011-12 series

2.29 To examine the robustness of the above findings, we also analyse how non-financial corporate debt-to-GDP and bank credit change with changes in government debt-to-GDP. We find no evidence of crowding out during FY 2001 and FY 2019, indicated by no correlation between the two sets of variables (Figure 14).

**Figure 14: Does higher government debt lead to lower corporate debt over FY2001 to FY 2019?**

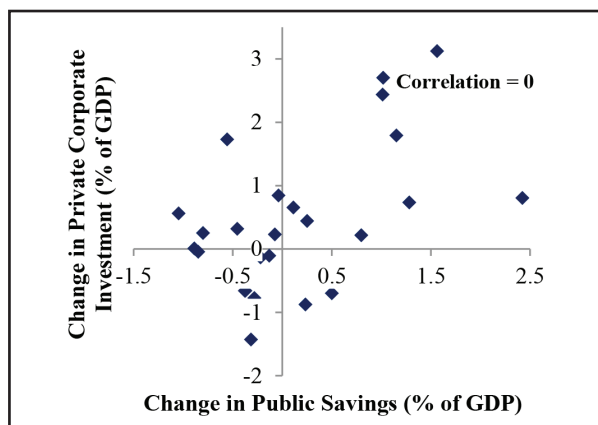
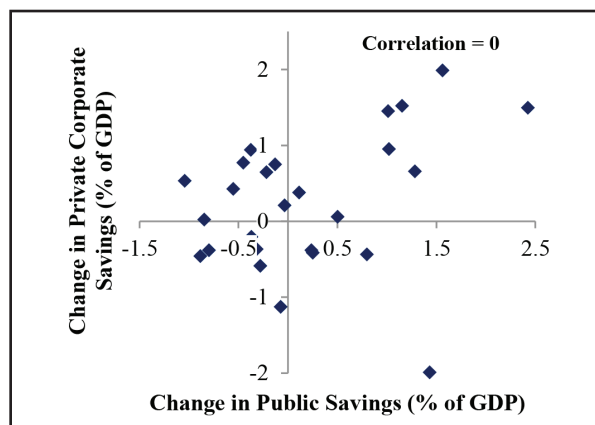
**14a: Relationship between change in government debt and change in corporate debt**

**14b: Relationship between change in government debt and change bank credit**



Source: RBI, IMF, MosPI

2.30 Similarly, we find no correlation between public sector savings and private investments by the corporate sector or between public sector savings and private savings by the corporate sector for the period FY1991 to FY2019 (Figure 15).

**Figure 15: No evidence of crowding out through savings channel (FY 1991- FY 2019)****15a: Correlation between change in Public Sector Savings with 1 year ahead change in Private Corporate Investment****15b: Correlation between change in Public Sector Savings with 1 year ahead change in Private Corporate Savings**

Source: MosPI

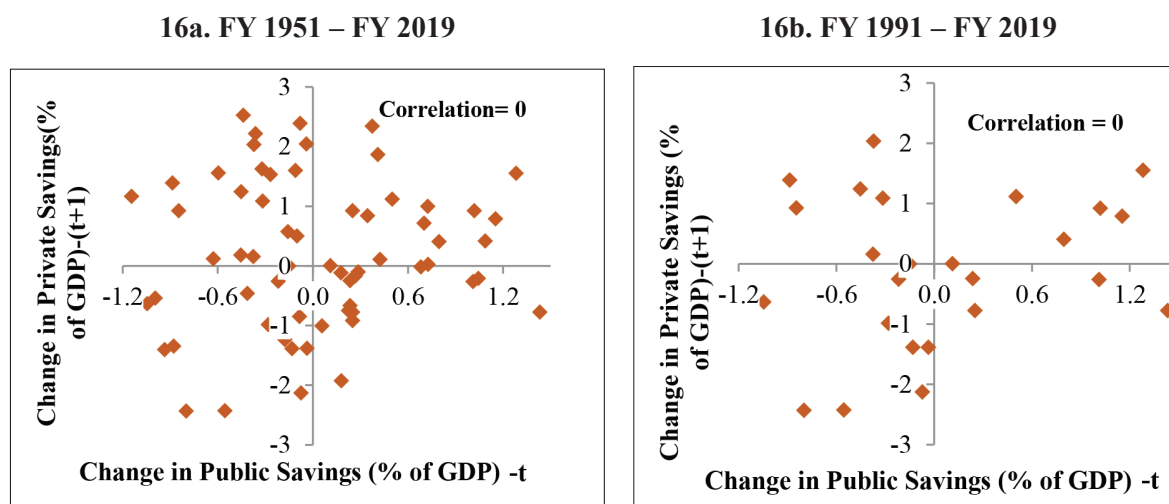
Savings, Investments and GDP upto FY2011 is 2004-05 series and from FY 2011 to FY 2019 is 2011-12 series

2.31 We also examine whether REP holds in the Indian context. Note that the validity of REP rests on a number of assumptions including (i) the representative citizen pays taxes; (ii) taxes are non-distortionary and are collected as a lump-sum; (iii) perfect capital markets with no borrowing constraints; (iv) future flows of income and future tax liabilities are certain; (v) representative citizen is infinite living, rational and forward looking. Numerous studies have found that REP does not hold in developing countries (see Haque and Montiel (1989), Khalid 1996). Leiderman and Blejer (1988) discuss the various channels that lead to possible deviations from the assumptions underlying REP. Ghatak & Ghatak (1996) test REP for the years 1950-1986 for India and find that REP does not hold in the Indian context.

2.32 We examine the validity of REP for India for the time periods 1950-2019 and 1990-2019. Figure 16 exhibits that there is no significant correlation between change in public savings and 1-year ahead change in public savings for India for various time durations over the last 70 years. The variable 'change in private savings' is taken with a 1-year lead to factor in adaptive consumer expectations as the representative consumer may not immediately alter his savings behaviour in response to the government's budget announcements. The results remain similar when contemporaneous correlations are examined between these two variables.



**Figure 16: Correlations between change in public Savings and 1 year ahead change in Private savings**

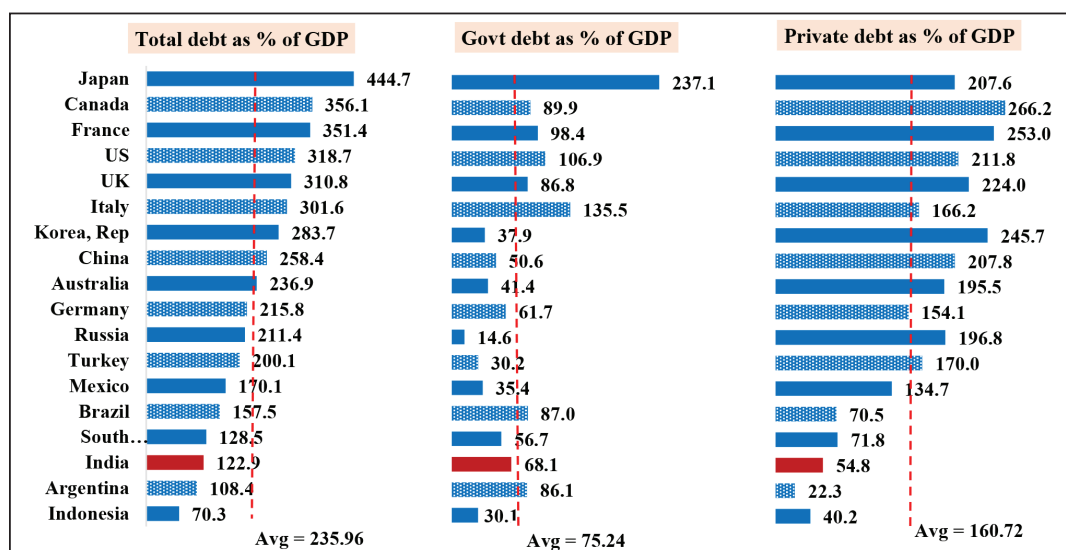


Source:MoSPI

### STRUCTURE OF INDIA’S DEBT

2.33 After analyzing the key parameters of debt dynamics and their implications, it is imperative to understand the structure and characteristics of India’s public debt. India’s public debt-to-GDP has been significantly low compared to high global debt levels (Figure 17). A cross-country comparison of debt levels points out that for India, the government debt level as a proportion of GDP is equal to the median in the group of G-20 OECD countries and in the group of BRICS nations. India’s overall debt levels as a per cent of GDP are the lowest amongst the group of G-20 OECD countries and also among the group of BRICS nations (Figure 18). Moreover, public debt and overall debt level for India has declined since 2003 and has been stable since 2011.

**Figure 17: Debt-to-GDP ratio for India amongst the Rest of the world (2018)**

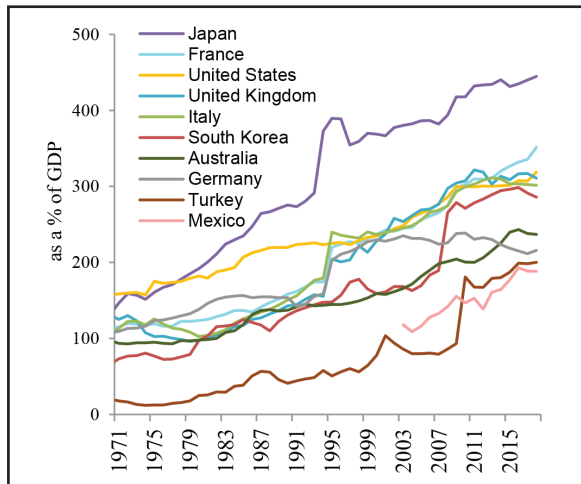


Source: IMF Debt database

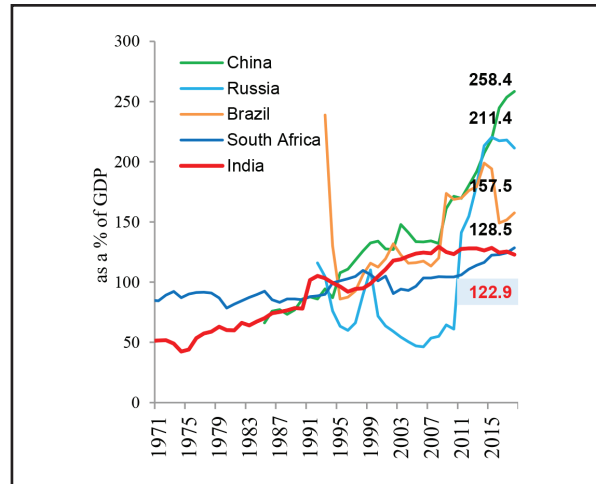
Private Debt Data: Japan, Canada, France, US, UK, Italy, Korea, Germany, Russia, Turkey, Mexico report Private debt for all instruments, and the remaining countries in the sample report Private debt (loans and debt securities). Private debt data for Turkey and Mexico is for 2017. General Government debt data is used except for Korea, South Africa, Argentina where Central Government debt has been used.

**Figure: 18: Trends in debt-to- GDP for India vis-à-vis other countries**

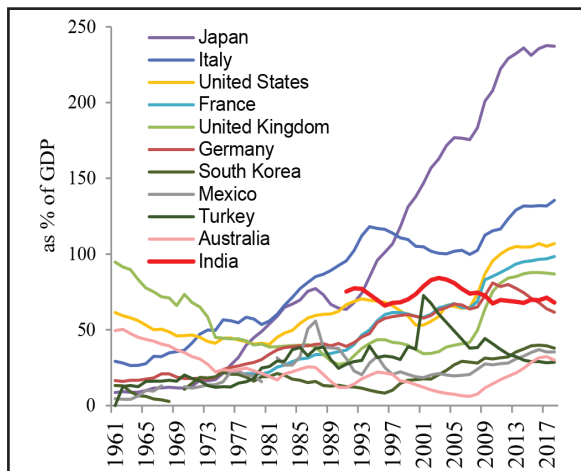
**18a. India lowest among G-20 OECD countries using Total Debt as per cent of GDP**



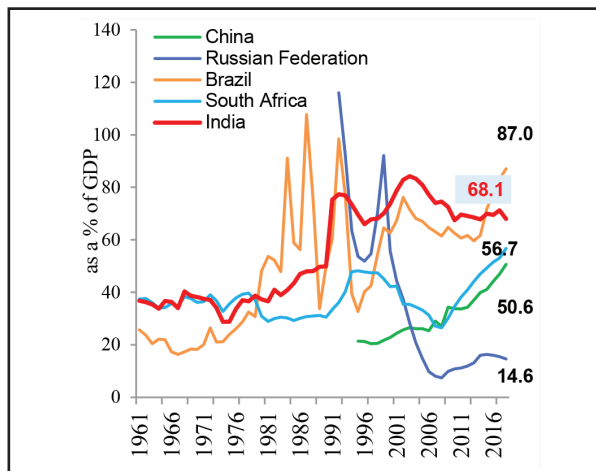
**18b. India lowest among G-20 BRICS countries using Total Debt as per cent of GDP**



**18c. India at median using Govt Debt as a per cent of GDP for G-20 OECD countries**



**18d. India at median using Govt Debt as a per cent of GDP for G-20 BRICS countries**

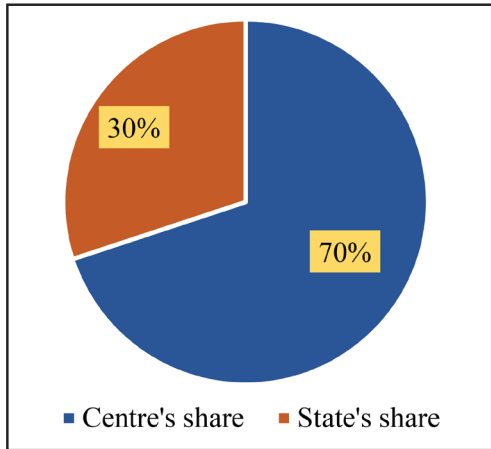


Source: IMF.

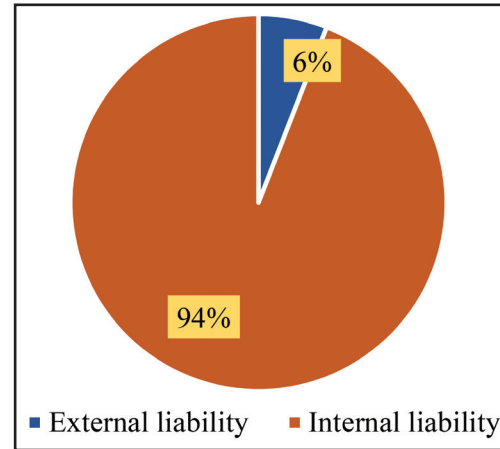
2.34 The Government’s debt portfolio is characterized by very low foreign exchange risk as the external debt is only 2.7 per cent of GDP ( 5.9 per cent of total Central Government liabilities) (Figure 20). Of the total public debt, 70 per cent is held by the Centre (Figure 19). As the central government is entrusted with the responsibility of macro-economic management, this distribution of debt between the centre and states is desirable because of the incentive compatibility that it generates. The long maturity profile of India’s public debt (issuance of longer tenure bonds) along with a small share of floating rate debt (floating rate debt of Central Government is less than 5 per cent of public debt) tends to limit rollover risks, and insulates the debt portfolio from interest rate volatility (Figure 21 and 22).<sup>2</sup>

<sup>2</sup> Source: Status Paper on Government Debt, Department of Economic Affairs, Ministry of Finance, April 2020.

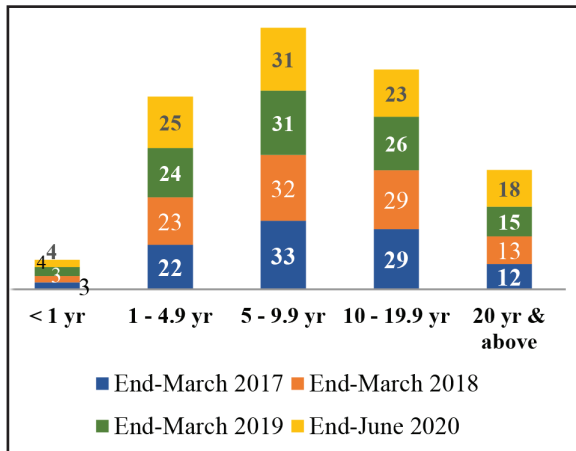
**Figure 19: Composition of General Government public debt**



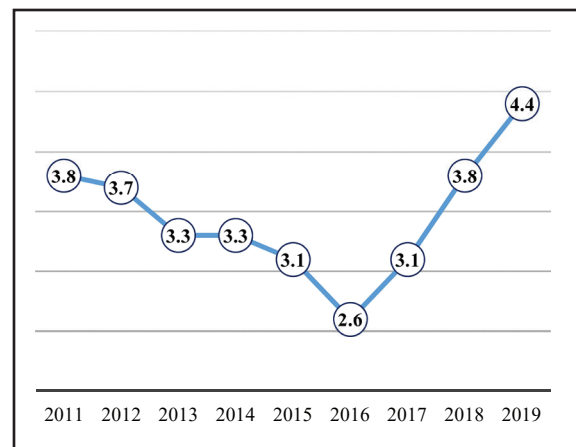
**Figure 20: Composition of Central Govt. debt**



**Figure 21: Maturity Profile of dated Central Government securities (per cent of total)**



**Figure 22: Total floating rate debt of Central Government as a per cent of Public debt**



Source: Quarterly Report on Public Debt Management and Status Paper on Government Debt, Department of Economic Affairs, Ministry of Finance.

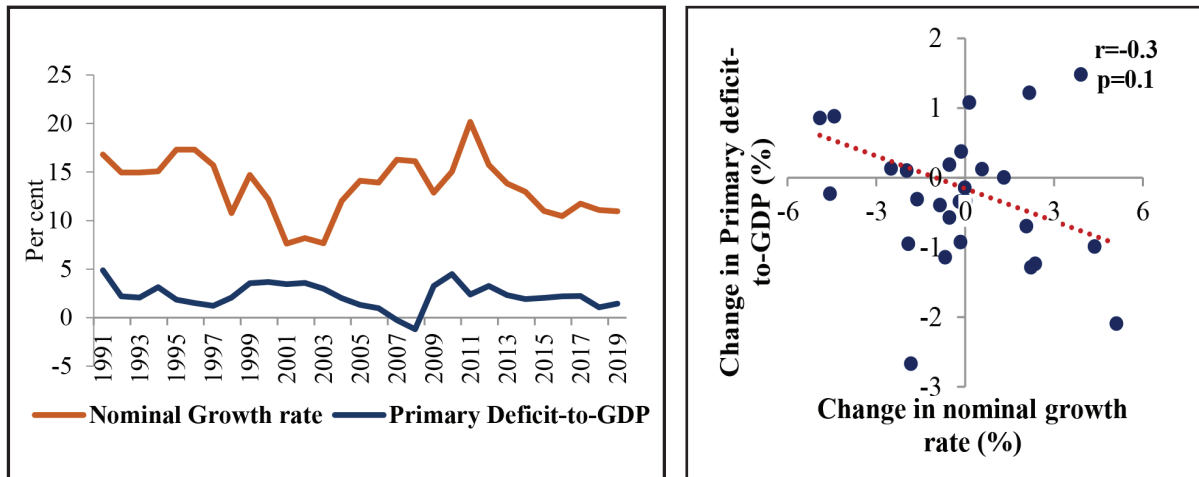
### SCENARIO ANALYSIS: IS INDIA’S CURRENT DEBT SUSTAINABLE?

2.35 We evaluate the sustainability of India’s debt in this section through macroeconomic scenario-based simulations (to account for various worst case scenarios). To ensure debt sustainability, i.e.  $d_t < d_{t-1}$ , we use the identity for debt dynamics explained in Box 3. By denoting negative primary balances as primary deficit (pd), we get:

$$d_t < d_{t-1} \Leftrightarrow pd_t < (\gamma_t - i_t) \cdot d_{t-1} / (1 + \gamma_t)$$

2.36 Thus, as long as the primary deficit is less than a maximum threshold, debt would remain sustainable. Note that the above inequality does not capture the fact that the primary deficit itself decreases with higher growth rate as seen in Figure 23. This is understandable as tax revenues increase with higher growth and thereby bring down the primary deficit. The decline in the primary deficit with growth increases the likelihood that the above inequality gets satisfied. This is because the right-hand-side of the inequality increases with growth and the left-hand-side of the inequality (pd) decreases with growth.

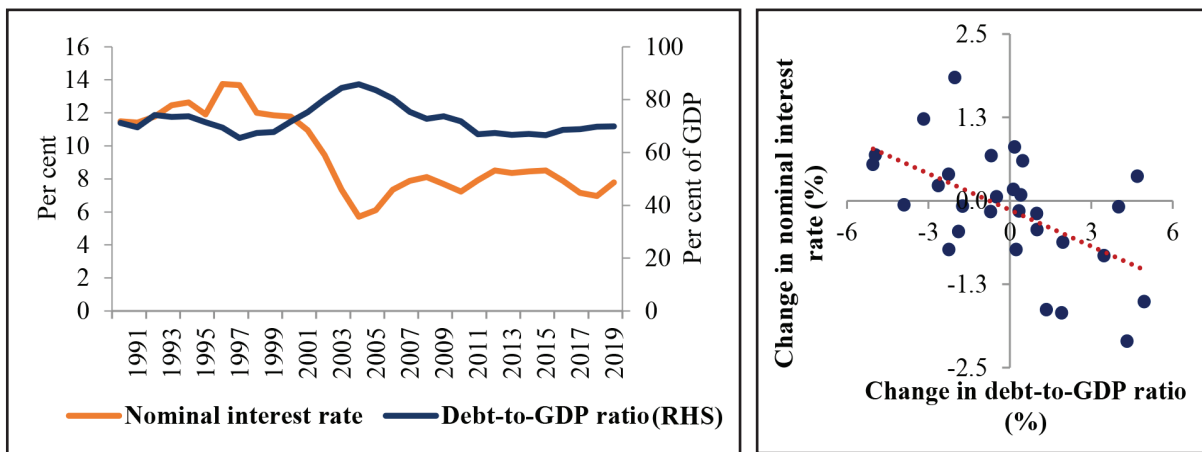
**Figure 23: Primary deficit-to-GDP declines with higher nominal growth**



Source: RBI, MoSPI.

2.37 Before undertaking the scenario analysis, it is important to examine the drivers for the nominal interest rate. If crowding out of private sector investment were the key phenomenon at play, an increase in the general government debt-to-GDP would increase the interest rate. However, Figure 24 below shows that an increase in the general government debt-to-GDP correlates with lower (not higher) nominal interest rates. This is, in fact, consistent with the evidence against the presence of crowding out demonstrated in Section V above.

**Figure 24: A higher debt-to-GDP ratio correlates with lower (not higher) nominal interest rates<sup>3</sup>**



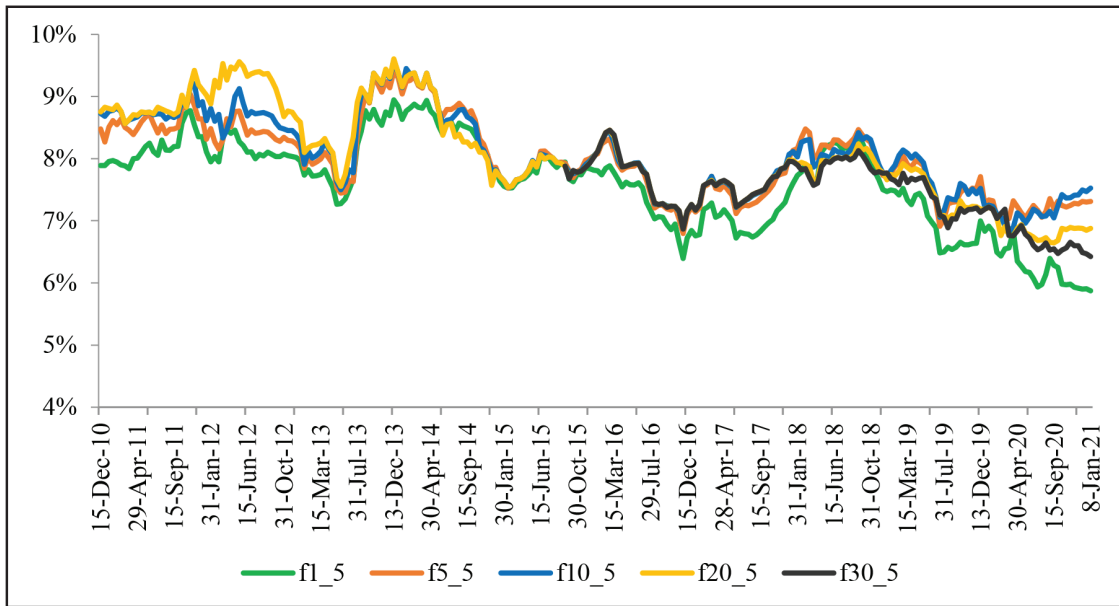
Source: RBI

2.38 As discussed in the previous sections of this Chapter, negative IRGD plays a pivotal role in ensuring debt sustainability. To project the IRGD forward, we first have to estimate the interest rate that are expected to prevail going forward. In the last three decades, we observe a strong negative correlation between debt-to-GDP ratio and nominal interest rates in India (Figure 24). Further, as Figure 25 clearly shows, the 5-year forward interest rates for all maturities (1 year, 5 years, 10 years, 20 years and 30 years) have been trending down sharply over the last decade. Even the 10-year rate give years forward, which is the maximum among all the 5-year

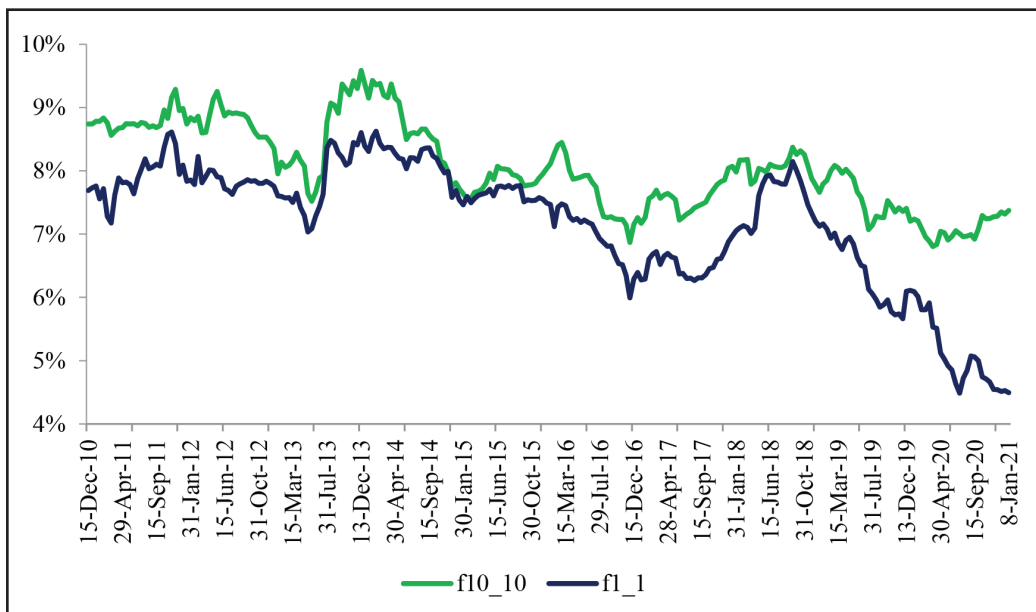
<sup>3</sup> Nominal interest rate used is the annual weighted average interest rate on Central Government securities (published by RBI)

forward rates, is less than 7.5 per cent. Assuming the lower range in the inflation target of 4 per cent, this implies that even with a real growth rate of 3.4 per cent over the next five years, the IRGD is highly likely to be negative going forward. In fact, as the average rate of government borrowing is a weighted average of the rates over various maturities, the cost of borrowing is likely to be significantly lower. Therefore, the IRGD is very likely to be negative for India in a 5-year horizon.

**Figure 25a: Trends in 5-year Forward Rates For Different Maturities**



**Figure 25b: Trends in forward rates for different maturities**



Source: ZCYC data has been taken from CCIL at fortnightly frequency for the past 10 years

Notes: fl\_5 denotes 5-yr forward rate of bonds with 1-yr maturity period.

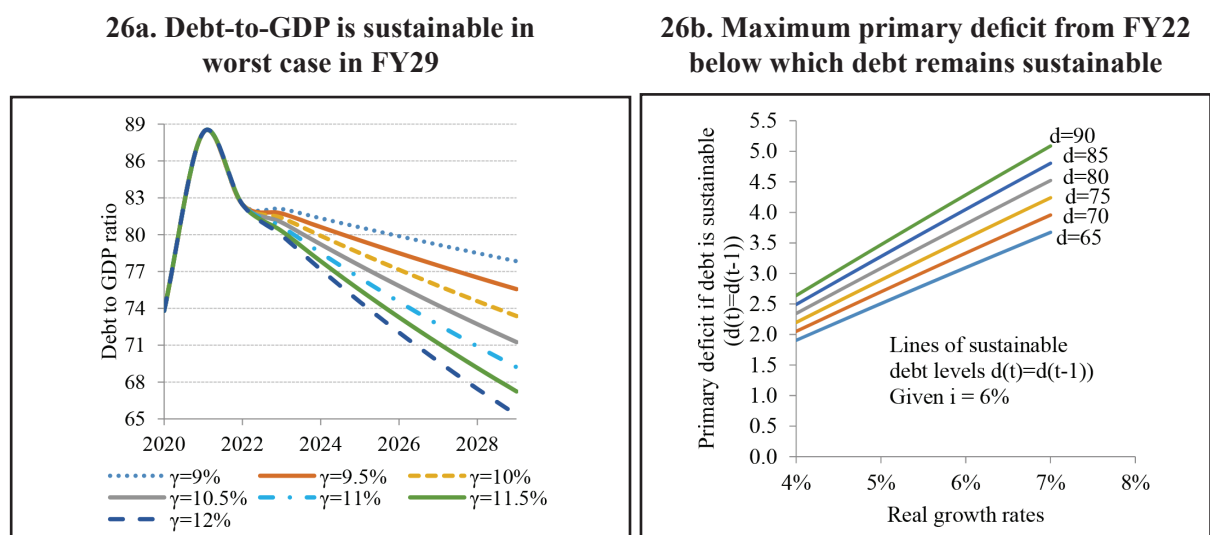
2.39 Note that while estimating the expected interest rates going forward using the forward rates, the endogenous role of monetary policy is not being accounted for. Specifically, since monetary policy is endogenous, low growth is likely to be accompanied by expansionary monetary policy and lower financing costs. Thus, in the forward-looking analysis, the beneficial impact of monetary policy on IRGD must be factored in. As a result, even in the worst-case scenario where growth is anaemic over the medium-term, its impact on debt sustainably gets moderated by supportive monetary policy. Thus, even in the extremely worst case scenarios, IRGD is expected to remain negative for India, thereby ensuring sustainability of debt. We therefore do the scenario analysis factoring in the highly likely negative IRGD in the steady state (Figure 26).

### Box 7: Assumptions for Debt simulations

The debt simulations for worst-case debt analysis are based on the following assumptions:

- (i) Real growth rate for FY21 is taken as -7.7 per cent (MoSPI) and real growth rate for FY22 is assumed as 11.5 per cent based on IMF estimates.
- (ii) General Government debt for FY20 is taken as 73.8 per cent of GDP (Revised Estimates from RBI)<sup>4</sup>
- (iii) The primary deficit (Centre + States) for FY21 is assumed to be 6.8 per cent of GDP. This equals 1.3 per cent of GDP as baseline PD (0.4 per cent Centre + 0.9 per cent States) + 5.5 per cent of GDP increase both due to revenue shortfalls and the Atmanirbhar Bharat Package. Primary deficit for FY22 is assumed to be 2.5 per cent of GDP. The declining trajectory of primary deficit is assumed to reach 1.5 per cent of GDP (0.2 per cent Centre PD + 0.5 per cent States PD + 0.8 per cent EBR) by FY24, and it is assumed to stay at 1.5 per cent thereafter. This is inclusive of EBR.
- (iv) Nominal interest rate is assumed to be 6 per cent. As on 26 January 2021, we estimate the weighted average cost of borrowing using the weights of General Government borrowing across maturities to be 6 per cent.
- (v) Inflation is taken as 5 per cent, i.e. mid-point of the range of 4 per cent – 6 per cent.

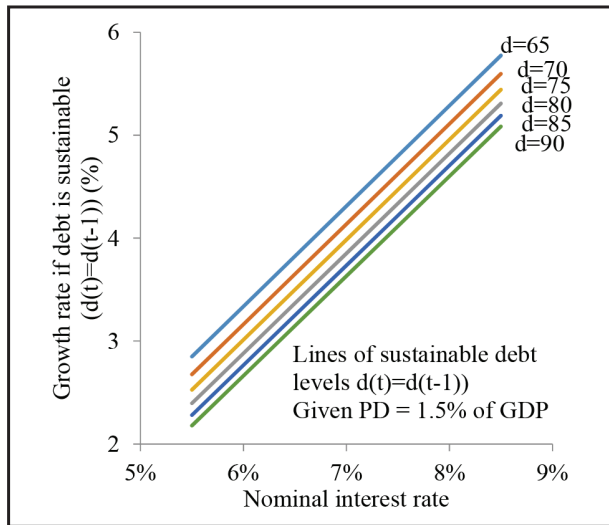
**Figure 26: Simulations of the worst case Debt Dynamics**



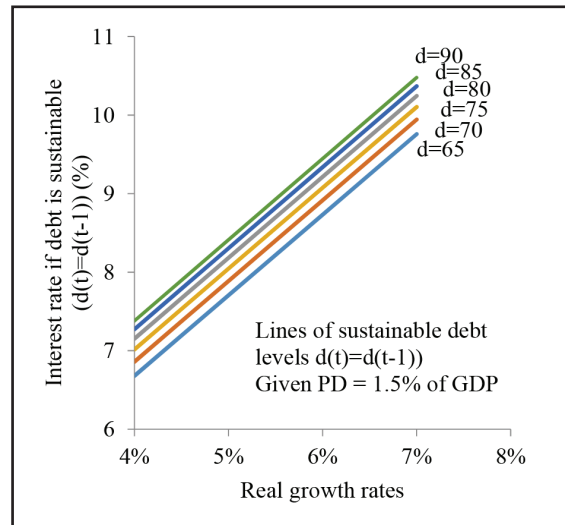
<sup>4</sup> Revised Estimate of General Government liabilities is taken as per cent of Provisional Estimate of GDP for FY 2019-20.



**26c. Minimum real growth rate from FY22, above which debt is sustainable**



**26d. Maximum interest rate from FY 22, below which debt is sustainable**



Source: RBI, MoSPI, Survey Estimates

Note:  $\gamma$ : nominal growth rate

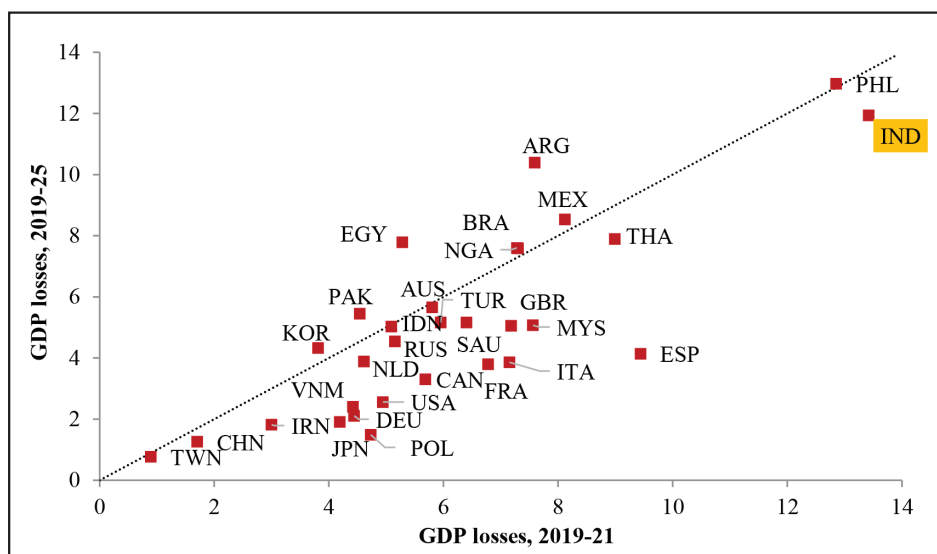
Figure 31 c and 31 d show that for a given level of sustainable debt, the IRGD will remain negative

2.40 The results depicted in Figure 26a suggest that in a worst case scenario where the real growth is only 4 per cent in the next 10 years, public debt is sustainable. The results in Figure 26b-d also show that even at high primary deficits, low real growth and high nominal interest rates, India's debt will remain sustainable.

## POLICY IMPLICATIONS

2.41 As argued above, the COVID-19 pandemic has created a significant negative shock to demand. The various costs of financial distress that firms face even before potential bankruptcy (Andrade and Kaplan (1998), Hotchkiss et al. (2008), Senbet and Wang (2010)) combined with possible firm bankruptcies in a choked bankruptcy system, on the one hand, and the possibility that jobs lost during the lockdown may not get fully retrieved, on the other hand, create the possibility of economic hysteresis that must be avoided at all costs. The World Economic Outlook (October 2020) edition highlights this in the case of India (see Figure 27). To eliminate the possibility of growth being impacted in the medium to long run, the Government has been extremely pro-active in launching several seminal reforms. However, their impact will manifest in the medium to long-term. To ensure that the economy remains in good health to avail the full benefit of these significant reforms, the "economic bridge" to the medium and long-term has to be created. Only an active fiscal policy – one that recognises that the risks from doing too little are much more than the risks from doing too much – can ensure that this "economic bridge" is well laid out.

2.42 Central to this change in policy stance is the recognition that if we apply the old framework to today's reality, if we fail to stimulate the economy, we risk the temporary weakness in demand leading to lower potential growth (Blanchard et al. 2015). With the IRGD expected to be significantly negative for India in the foreseeable future, pro-cyclical fiscal policies may lead to higher, not lower, debt/GDP ratios.

**Figure 27: Potential for long-term impact of COVID-19 crisis on growth**

Source: IMF World Economic Outlook, October 2020

### Box 8: Fiscal rules for counter-cyclical fiscal policy

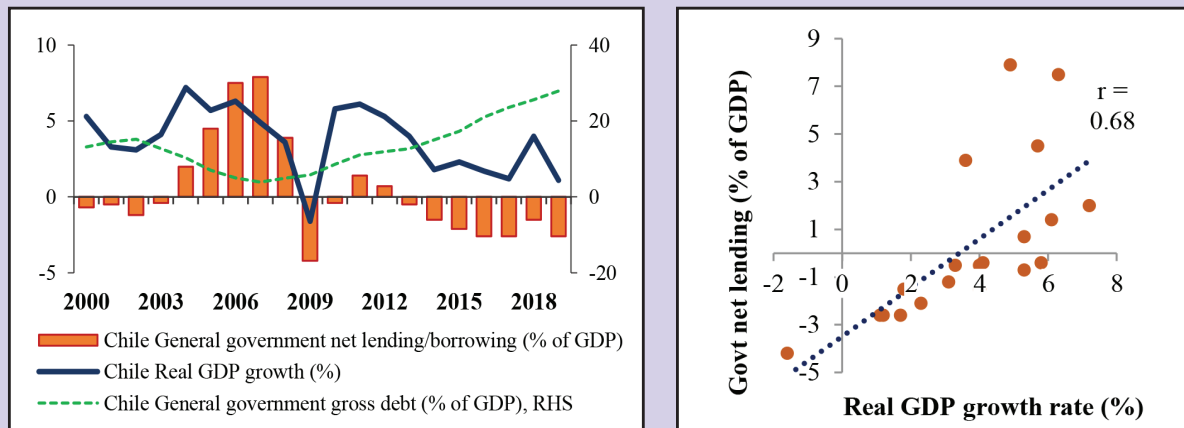
Fiscal rules are quantitative targets with respect to budgetary aggregates such as deficits, debt, expenditure or revenue, which impose a long-lasting constraint on the fiscal policy. Broadly they are referred to as “budgetary institutions” (Alesina and Perotti, 1999), i.e. a set of rules and regulations according to which budgets are prepared, approved and implemented. As per IMF, 78 countries had adopted some form of national fiscal rule by the year 2015, as part of the significant reforms in the fiscal framework. However, it is important to be cautious since some of these rules may entail a pro-cyclical stance in bad economic times.

In this context, the Chilean experience with fiscal rules that enable counter-cyclical fiscal policy provides important learnings. In 2000, Chilean Government adopted the structural surplus rule that targeted the overall central government’s structural balance to be a surplus of 1 per cent of GDP every year. This target was subsequently revised to 0.5 per cent of GDP in 2007, and further to a simple balanced budget in 2009 (when the debt was almost paid off). Unlike the effective budget balance, which indicates the current fiscal position, structural balance reflects the medium-term fiscal outlook. The structural balance for Chile is estimated in the budget using forward-looking estimates of potential GDP and copper prices (since copper is the key driver of revenue in Chile—the largest exporter of copper). It therefore gives an estimate for the total maximum spending level allowed in the budget for the year. If the economy grows at a rate higher than the estimated potential GDP or if there is an increase in the copper prices over the medium term, more revenues are collected. However, since the government expenditure is capped for the fiscal year, the Government runs a surplus during economic booms. Similarly, in years when the output and revenues are below potential, the government runs a deficit since the fiscal rule does not allow spending cuts. Thus, the Chilean rule allows the automatic stabilizers to operate, and the overall budget balance to adjust with the state of the economy. This would thereby imply that with economic growth, the debt-to-GDP ratio should gradually fall.

The Chilean economy has benefited hugely from this budget rule, as the national savings rose from 20.6 per cent to 23.6 per cent between 2000 and 2005, leading to a sharp fall in central

government debt-to GDP ratio and improved sovereign debt ratings (Frankel, 2011). During the copper boom of 2003-2008, despite high copper prices leading to higher export earnings and economic growth, counter cyclical fiscal policy led to a budget surplus of almost 8 per cent and government debt reducing to mere 4 per cent of GDP. During the subsequent phase of Global recession when the copper prices had fallen, the government adopted unprecedented expansionary policy (using the surpluses accumulated during the copper boom) to mitigate the effects of the crisis (budget deficit crossed 4 per cent of GDP).

**Figure 28: Counter-cyclical fiscal policy by Government of Chile (2000 to 2019)**



Source: IMF

The strength of fiscal rules based upon potential GDP however, depends on the accuracy of estimated potential GDP. When potential GDP is estimated accurately, a structural balance rule ensures a counter-cyclical fiscal policy and leads to a gradual reduction in the debt-to-GDP ratio.

2.43 During economic crises, a well-designed expansionary fiscal policy stance can contribute to better economic outcomes in two ways. First, it can boost potential growth with multi-year public investment packages that raise productivity. The multi-year nature of public investment would contribute to credibly lifting growth expectations. With the National Infrastructure Pipeline (NIP) already laying out the agenda for ambitious public spending, fiscal policy catering to funding NIP in the first few years can boost growth and thereby be self-financing (DeLong and Summers, 2012). At a time of excessive risk aversion in the private sector, which is characteristic of any economic crisis, risk taking via public investment can catalyse private investment and unleash a virtuous circle. It will crowd in private investment, rather than crowd it out. Second, there is a risk of the Indian economy falling into a low wage-growth trap, as has happened in Japan during the last two decades. Implementing the NIP via front-ended fiscal spending could generate higher-paying jobs and boost productivity.

2.44 The experience of Chile in implementing fiscal rules that enable counter-cyclical fiscal policy is quite informative in this context (see Box 8 for details). As estimation of potential growth can become challenging to implement such fiscal rules, it would be practical in the Indian context to frame fiscal rules so as to allow space for fiscal policy to respond to slowdowns in growth. The National Bureau of Economic Research (NBER) defines a recession in the United States as two consecutive quarters of decline in GDP. Given the average growth and the standard deviation of growth in the United States, negative growth corresponds to a 1.5 standard deviation decline in growth. Similarly, a 1.65 standard deviation decline in growth, would *a priori* manifest once in ten quarters or with a probability of 10 per cent, equals 3.5 per cent.

Therefore, a practical fiscal rule should provide wriggle room for fiscal policy to be counter-cyclical by setting the trigger as a two-quarter slowdown in GDP growth of 3.5 per cent when compared to the average GDP growth over the previous 20 quarters ( $2/20 = 10$  per cent). As the average and standard deviation of growth may change over time, this trigger of 3.5 per cent decline can be reviewed periodically say every five years.

2.45 A counterargument by critics – Paul Krugman’s “deficit scolds”<sup>5</sup> – may be that governments have a natural tendency to spend. So, does the Survey give them arguments to misbehave? This represents an incorrect interpretation of the Survey findings. The right interpretation is not to pretend that debt is catastrophic if it is not. The Survey’s effort is thus to provide the intellectual anchor for the government to be more relaxed about debt during a time of economic crisis such as the one we are witnessing. Thus, the Survey’s call for a more active, counter-cyclical fiscal policy is not a call for fiscal irresponsibility. It is a call to break the intellectual anchoring that has created an asymmetric bias against fiscal policy. Once growth picks up in a sustainable manner, it will be the time for fiscal consolidation. But, for now, fiscal policy will have to remain centre-stage to support growth in the foreseeable future.

## CHAPTER AT A GLANCE

- This Chapter establishes clearly that growth leads to debt sustainability in the Indian context but not necessarily vice-versa. This is because the interest rate on debt paid by the Indian government has been less than India’s growth rate by norm, not by exception. As Blanchard (2019) explains in his 2019 Presidential Address to the American Economic Association: “If the interest rate paid by the government is less than the growth rate, then the intertemporal budget constraint facing the government no longer binds.” This phenomenon highlights that debt sustainability depends on the “interest rate growth rate differential” (IRGD), i.e. the difference between the interest rate and the growth rate in an economy.
- In advanced economies, the extremely low interest rates, which have led to negative IRGD, on the one hand, and have placed limitations on monetary policy, on the other hand, have caused a rethink of the role of fiscal policy. The same phenomenon of a negative IRGD in India – not due to lower interest rates but much higher growth rates – must prompt a debate on the saliency of fiscal policy, especially during growth slowdowns and economic crises.
- The confusion about causality – from growth to debt sustainability or vice-versa – is typical of several macro-economic phenomena, where natural experiments to identify causality are uncommon. In the specific context of growth and debt sustainability, this confusion also stems from the fact that the academic and policy literature focuses primarily on advanced economies, where causality is entangled by lower potential growth when compared to India. Indeed, the chapter studies the evidence across several countries to show that growth causes debt to become sustainable in countries with higher growth rates; such clarity about the causal direction is not witnessed in countries with lower growth rates. By integrating ideas from Corporate Finance into the macro-economics of Government debt à la Bolton (2016), the Survey lays the conceptual foundations to understand why these differences can manifest between high-growth emerging economies and low-growth advanced economies.

<sup>5</sup> <https://www.nytimes.com/2016/07/11/opinion/cheap-money-talks.html>

- As the COVID-19 pandemic has created a significant negative shock to demand, active fiscal policy – one that recognises that fiscal multipliers are disproportionately higher during economic crises than during economic booms – can ensure that the full benefit of seminal economic reforms is reaped by limiting potential damage to productive capacity. As the IRGD is expected to be negative in the foreseeable future, a fiscal policy that provides an impetus to growth will lead to lower, not higher, debt-to-GDP ratios. In fact, simulations undertaken till 2030 highlight that given India’s growth potential, debt sustainability is unlikely to be a problem even in the worst scenarios. The chapter thus demonstrates the desirability of using counter-cyclical fiscal policy to enable growth during economic downturns.
- While acknowledging the counterargument from critics that governments may have a natural proclivity to spend, the Survey endeavours to provide the intellectual anchor for the government to be more relaxed about debt and fiscal spending during a growth slowdown or an economic crisis. The Survey’s call for more active, counter-cyclical fiscal policy is not a call for fiscal irresponsibility. It is a call to break the intellectual anchoring that has created an asymmetric bias against fiscal policy.

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