Monetary Fiscal Coordination and the Evolution of Public Debt **A Simple Simulation Exercise**

ADVAIT MOHARIR

Using an accounting framework, this article simulates the evolution of the debt ratio based on four policy interventions. It recommends pursuing an expansionary monetary policy combined with an equally active and complementary fiscal policy. The article also says that monetary policy should target the debt ratio, while fiscal policy should target output.

The author would like to thank the anonymous referee(s) Arjun Jayadev and Krithika Raghavan for their comments on a previous version of this article. All errors remain his own.

Advait Moharir (advait.moharir16ug@apu. edu.in) is currently with the CORE Project in partnership with Azim Premji University.

The COVID-19 pandemic has exacerr bated the downturn in an already stagnating economy, with production still below pre-pandemic levels. After a record shrinkage of 23.9% in the June quarter, the growth rates still remain in negative territory, with positive growth rates expected only in March 2021 (Mishra 2020). Commentators fear that the financial resources required to combat a crisis of such magnitude will lead to a sharp rise in the debt-to-gross domestic product (GDP) ratio, with former Chief Economic Advisor Arvind Subramanian predicting it to rise to 85% of the GDP from the current 70.4% (Press Trust of India 2020).

The pandemic has created many possibilities for the evolution of India's debt trajectory over the next few years. In this article, I present four scenarios of debt evolution and assess the impact of the associated policies leading to these trajectories. Using simulations, I show that the best-case situation for the debt trajectory is when the government cuts interest rates, while attempting to reduce debt by cutting spending is only the third best. Consequently, to successfully manage the debt ratio, the government needs to keep interest rates low and increase spending.

The debate on debt sustainability in India is typically framed in the context of "fiscal rules." These rules refer to some indicator of public debt, generally the debt-

a particular limit that this indicator cannot exceed. The Fiscal Responsibility and Budget Management (FRBM) Act, 2003 was promulgated with the aim to conduct "prudential debt management consistent with fiscal sustainability through limits on the central government Source: RBI (2020). borrowings, debt and deficits" (Comptroller and Auditor General of India 2019). The act originally mandated the government to target the gross fiscal deficit and bring it down to 3% of the GDP by 2007–08 (Roy and Kotia 2018). However, circumstances since have required the government to spend over and beyond this limit multiple times, especially in the wake of the global financial crisis, allowing the target to be met only once (Figure 1).

In light of the various criticisms (Bhaduri 2006; Buiter and Patel 2012) and the inability to meet deficit targets, the government set up an FRBM review committee. In its report released in 2017. the committee recommended that instead of targeting the deficit, the anchor now be shifted to the debt-to-gpp ratio (called "debt ratio" henceforth). The report recommended that the government systematically reduce its debt to 60% of the GDP by 2024-25 (Ministry of Finance 2017). Additionally, the government has also shifted the deadline for achieving the 3% deficit target to March 2021 (Rangarajan and Srivastava 2018). With the debt ratio currently at 70% (Reserve Bank of India 2020), there have been calls for increased fiscal prudence, but the pandemic has thrown these plans into disarray.

What then can one say meaningfully about the choices now available to policymakers and the implications for the management of debt?

Debt Dynamics

The evolution of the debt-to-gpp ratio depends on two factors-one, new borrowing during a period (also known as primary deficit), and, two, the combined effect of growth, interest rate and inflation on the previous year's debt-to-gdp ratio. Following Mason and Jayadev (2014), this to-GDP ratio, and define Figure 1: Gross Fiscal Deficit as a Percentage of Gross Domestic Product



2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018

article uses the term "Fisher Dynamics" for the second term, named after Irving Fisher's (1993) pioneering work linking deflation to rising debt levels in the United States (us). The following equation encapsulates the effect of these two factors:

$$b_t = \frac{(1+i)}{(1+g+\pi)} b_{t-1} + d_t + sfa$$
 ...(1)

or

 $b_t - b_{t-1} = \Delta b_t = \beta b_{t-1} + d_t + sfa ... (2)$ where,

$$\frac{(i-g-\pi)}{(1+g+\pi)} = \beta$$

 Δb is the change in the debt-to-GDP ratio, *i* is the nominal interest rate, calculated by dividing year-on-year interest payments by outstanding liabilities. *g* is the real growth rate, π is inflation, and *d* is the primary deficit. b_{t-1} is the debt ratio in the previous year. *sfa* refers to stockflow adjustments, which includes debt write-offs.

Equation 2 decomposes the change in the debt ratio into two components. First, the debt ratio rises due to new borrowings, indicated by the positive sign of the primary deficit (d). However, the ratio is also affected by the impact of interest rate, growth and inflation on the previous year's debt ratio. A rise in *i* leads to an increase in liabilities, while growth and inflation reduce the cost of borrowing by increasing the size of the denominator (GDP). The sfa is computed as a residual. The change in the debt ratio consequently depends on the relative strength of these two components, that is. primary deficit and Fisher Dynamics.

Equation 2 also helps clarify the relative efficacy of policy instruments at various levels of debt. If the debt-to-GDP ratio (*b*) is low, then the component β b_{t-1} will contribute less to the change in debt compared to the primary deficit. In this case, reducing new borrowing helps bring the debt ratio down. However, at high levels of debt, the relative strength of *d* is significantly diminished, and austerity at such levels is less effective. Instead, cutting interest rates (*i*) has a more substantial effect. For example, if the debt ratio for this year is 60%, and the value of β is 1.92%, then the contribution of

Fisher Dynamics to the change in debt ratio will be 1.15%. However, if the debt ratio is 20%, *ceteris paribus*, then the contribution is only 0.38%.

While studies of public debt and debt sustainability typically use econometric techniques, in recent times, a new literature has emerged that uses some variant of the above described accounting method. The technique has been used for the decomposition of the us public debt (Hall and Sargent 2011), the US private debt (Mason and Jayadev 2014), and the Italian public debt (Baccaro and D'Antoni 2020). A basic decomposition of India's national public debt was undertaken in the early 2000s (Rangarajan and Shrivastava 2005), where primary deficits were found to be the primary driver of the debt trajectory. A previous work (Moharir 2020) on the decomposition of both national and subnational public debt in India for 1980-2017 finds that the Fisher Dynamics (β) accounts for more than two-thirds of the change in the debt-to-GDP ratio. Also, throughout 1981–2017, the growth rate has exceeded the interest rate, which means that the growth rate of liabilities is slower than the increase in output. Consequently, the debt ratio has to converge to a finite output, and not rise infinitely. These findings are confirmed by a study (Das and Ghate 2020), which did the analysis with different interest rates, rather than a single one. The security-level analysis also establishes that inflation plays a key role in reducing India's public debt.

Four Scenarios

Data and variables: Using equation 1, the study simulates the trajectory of debt/ GDP over the next seven years (2021-26).¹ The values of *i*, *g*, π , and *d* are chosen randomly from a given range. Table 1 shows the range for each variables in each scenario.

The study consider four scenarios. The first scenario is the baseline scenario, where all the four variables continue to be in the same range for the next six years as they are in 2020.² The range for growth draws from the projections for 2021 by the World Bank and International Monetary Fund, based on the assumption that there will be a post-COVID-19 recovery. The range for inflation is taken from the trends in the consumer price index, which is on the rise and currently at 6.93% (as of November 2020).

The primary deficit was 1.6% in 2019 but is expected to rise. With the pandemic still at large, the recovery is going to be slow, and new borrowings are going to be high for a prolonged period. Hence, the range for the primary deficit is more elevated, between 2% and 4%. The interest rate is the weighted average of the yield of the 10-year government bond, which has varied in the 6% to 8% range over the last year. The baseline scenario constitutes the benchmark against which the study evaluates all other policies.

With the baseline now established, the other three scenarios depict specific deviations in one of the four variables. The fixed primary deficit scenario is when the government sets a target for a new borrowing. With a significant rise in expenditure necessitated due to the pandemic, the primary deficit will rise. The study fixes the level at 3%, that is, the government will maintain this level of spending for the entire period of 2021– 27. This can be considered a strict implementation of the FRBM, where fiscal consolidation regulates the debt ratio.

The fixed interest rate scenario is the opposite of the case described above, in the sense that it does not restrict spending in any way but instead anchors the cost of borrowing. From February to July 2020, the Reserve Bank of India (RBI) has

Table 1: Rang	ge of Values	s for Intere	st Rate, (Growth,
Primary Defi	cit and Inf	lation for \	larious S	conario

Thinking Denicity and Innation For Various Section 105				
Scenario	Variable	Range (%)		
Baseline	Interest rate	6-8		
	Growth	2-4		
	Inflation	5-7		
	Primary deficit	3-4		
Fixed interest rate	Interest rate	4		
	Growth	2-4		
	Inflation	5–7		
	Primary deficit	3-4		
Rising inflation	Interest rate	6-8		
	Growth	2-4		
	Inflation	7–9		
	Primary deficit	3-4		
Fixed primary deficit	Interest rate	6-8		
	Growth	2-4		
	Inflation	5–7		
	Primary deficit	3		

COMMENTARY





cut the repo rate by 115 basis points to induce spending (Bhat 2020). However, concerns about rising inflation have since led to the rate being left unchanged at 4%. In this context, we assume that the RBI is trying to aid recovery, but also regulate inflation, by fixing the repo rate at 4%. Here, the government uses monetary policy instead of fiscal policy for debt consolidation.

The last case is a possible consequence of present economic conditions. Rising food prices have pushed up India's inflation to nearly 7%, as of July 2020. With the announcement of stimulus packages, the study assumes that the inflation levels will remain high over the next few years. The bandwidth of variation shifts upwards in the range of 6%–9%. It is important to note that this scenario is an expected outcome, not a policy intervention.

Results

With each scenario fleshed out, we can now examine the evolution of the debt ratio (Figure 2). Multiple agencies projected the growth rate for financial year (FY) 2020 to be as low as -20%, while more optimistic ones have pegged it at -6% (Dhasmana 2020; Mishra 2020). I run 10,000 iterations of equation 1, by taking the value of g between -20% and -6% and choose the average as the debt ratio for 2021. From 2022 to 2027, all variables draw from the range in Table 1. I simulate each scenario 10,000 times. The average trajectories are depicted in Figure 2. How does the debt ratio evolve in each case?

In the baseline scenario, there is a sharp rise in the debt ratio from 2020 to 2021, followed by a steady increase over the next six years, settling at a little above 96%. As discussed before, the debt ratio changes due to two factors: Fisher Dynamics and primary balance. At a higher debt ratio, Fisher Dynamics have a more substantial impact on the debt ratio than primary balance. The values of interest rate, growth, and inflation determine the size of Fisher Dynamics. In this scenario, while the interest rate and inflation remain moderately high, growth collapses in 2020. This leads to a fall in GDP, which inevitably causes the debt ratio to rise. Despite a recovery in 2021 in the range 2%-4%, the gap between the interest rate and growth (i-g) is still wide enough that the Fisher Dynamics term is positive and higher than the primary deficit. This drives the steady increase in the debt ratio.

In the fixed deficit scenario, the government attempts to reduce new borrowing by setting the primary deficit at 3% for all years. Spending cuts typically achieve this.³ However, at a high debt ratio, the primary deficit has significantly less power in determining the debt trajectory. The combination of low growth and high interest widens the interest-rate growth gap (i–g). This differential keeps the Fisher Dynamics term positive and pushes the rise in the debt ratio to almost 93% by 2027. The impotence of cutting spending in reducing the debt ratio highlights an important point: borrowing does not equal debt.

Inflation is a vital determinant of the debt trajectory; equation 1 shows that rising inflation pushes the debt ratio down, while deflation does the opposite. In this scenario, the economy faces rising inflation, leading to an immediate reduction in the interest-growth differential. The growth rate of debt slows down, observed in the relatively flat debt trajectory from FY 2022 onwards, ending at around 89% by 2027. As Figure 2 shows, however, this is still not the best scenario, as rising inflation is not accompanied by increasing growth. The combined effect of these two variables would have flattened the trajectory, but the Indian economy is in a unique situation of slow growth and rising inflation (Mundle 2020). The dampening impact of inflation on the debt trajectory is limited by a low g, which allows the Fisher Dynamics term to be big enough to push the debt ratio upwards.

Finally, in the last scenario, the central bank fixes the rate at 4%. The impact becomes visible from FY 2022 onwards. Despite a sudden spurt in FY 2021, the debt ratio immediately tapers off and rises slightly in the last two years, settling at 81%, the lowest of all the four scenarios. The falling interest–growth differential



COMMENTARY =

(i-g) reduces the cost of borrowing and makes the Fisher Dynamics term negative. Additionally, it is essential to note that the government has much more control over the interest rate than it has over growth and inflation, as these are outcomes of a particular set of actions than policy tools. Thus, using monetary policy to target the ratio turns out to be the best-case scenario.

Conclusions

The exercise helps us gauge the efficacy of various instruments. The baseline scenario allows the debt ratio to grow linearly, given that the interest rate is higher than the growth rate, and effectively represents a policy of non-intervention. The last scenario is dependent on an outcome, that is, an observed rise in inflation, leading to a higher nominal GDP and a reduced debt ratio. The two remaining scenarios are the crucial ones, as these are the tools/levers that the government has at its disposal. The first is monetary policy, where the government fixes the interest rate (i). Using the interest rate to target the debt ratio (Lerner 1943) is a useful policy tool, as it lowers the cost of borrowing, injects liquidity to the system, and does not directly constrain the government's ability to spend.

The second tool is fiscal policy, personified by the fixed public borrowing scenario. Constraining spending at this juncture will be detrimental not only to the debt ratio, but also for the macroeconomy as a whole. As an economy in the middle of a recession exacerbated by the pandemic, support from the government in terms of cash assistance, infrastructure spending, and employment generation is crucial. Pursuing a contractionary fiscal policy to target debt has high human costs, as state support is needed more than ever in times of crisis.

Monetary policy has been actively used during the last three months, with moratoriums on borrowings, low-interest rates, and the recent restructuring of loans (R Misra 2020). Fiscal policy has been passive, with the announced series of packages being less than 1% of the GDP, despite contrary claims (U Misra 2020). With countries around the world abandoning debt targets and doing "whatever it takes" to mitigate the crisis, India needs to pursue an active fiscal policy to complement the policies of the central bank.

However, this exercise has some limitations. First, the baseline scenario itself relies on projections, which make further predictions derivative. Second, the simulations are run in a static framework, where only one variable is allowed to vary, while others remain constant. In reality, all variables interact with each other and affect each other. For example, a reduction in interest rates can induce consumption positively affect growth. In the model, however, interest rates only change the debt ratio. Despite these limitations, the equation used to simulate debt itself is based on an accounting framework that is true by construction. Overall, the projections do help us attain a general sense of where the debt ratio might lie in the short to medium run.

NOTES

- ¹ Each year represents the beginning of the financial year. For example, 2020 means March 2020.
- 2 The study calculates the debt ratio for 2020 using data from the RBI Annual Report 2019–20. It says $b_{i-1} = 70.4\%$, d = 1.9%, g = 4.2%, i = 6.7%, and $\pi = 4.8\%$ from this, the debt ratio for 2020 is 70.8%.
- 3 The other route to reducing the primary deficit is by increasing revenue, via taxation. However, it is well-established that India has a low tax base, and this significantly narrows the possibility of using this policy over cutting spending.

REFERENCES

- Baccaro, L and M D'Antoni (2020): "Has the 'External Constraint' Contributed to Italy's Stagnation? A Critical Event Analysis," Discussion Paper Nos 20–29, Max Planck Institute for the Study of Societies.
- Bhaduri, A (2006): "The Politics of Sound Finance," Economic & Political Weekly, Vol 41, Nos 43–44, pp 4569–571.
- Bhat, S (2020): "RBI Likely to Cut Rates Despite Inflation Risk," *Reuters*, https://in.reuters.com/ article/india-economy-rates-idINKBN24ZoKF.
- Buiter, W and U Patel (2012): "Fiscal Rules in India: Are They Effective"? Oxford Handbook of the Indian Economy, Oxford University Press.
- Comptroller and Auditor General of India (2019): Compliance of the Fiscal Responsibility and Budget Management Act, 2003, Department of Economic Affairs, Ministry of Finance (Compliance No 20).
- Das, Pand Ghate C (2020): "Public Debt in India: A Security Level Analysis," [MPRA Paper], https://mpra.ub.uni-muenchen.de/103746/.
- Dhasmana, I (2020): "India's Economic Growth Rate May Contract 16–20% in Q1, Says Icra," Business Standard India, 5 May, https://www.businessstandard.com/article/economy-policy/india-seconomic-growth-rate-may-contract-16-20-in-q1says-icra-120050500089_1.html.

- Fisher, I (1933): "The Debt-deflation Theory of Great Depressions," *Econometrica*, Vol 1, No 4, pp 337–57, JSTOR.
- Hall, G J and T J Sargent (2011): "Interest Rate Risk and Other Determinants of Post-WW II US Government Debt/GDP Dynamics," *American Economic Journal: Macroeconomics*, Vol 3, No 3, pp 192–214, https://doi.org/10.1257/mac.3.3.192.
- Lerner, A (1943): "Functional Finance and the Federal Debt," *Social Research*, Vol 10, No 1, pp 38–51, JSTOR.
- Mason, J W and A Jayadev (2014): "Fisher Dynamics" in US Household Debt 1929–2011," *American Economic Journal: Macroeconomics*, Vol 6, No 3, pp 214–34, https://doi.org/10.1257/mac.6.3.214.
- Ministry of Finance (2017): FRBM Review Committe Report, Government of India.
- Mishra, A R (2020): "India's FY21 Growth to Contract by 6% as COVID-19 Cases Rise, Says Barclays," *Livemint*, 14 August, https://www.livemint.com/news/india/barclays-lowers-indias-fy21-growth-forecast-to-6-as-covid-19-casesrise-11597385295625.html.
- Misra, R (2020): "What All RBI Did during COVID-19?" Outlook Money, 29 May, https://www.outlookindia.com/outlookmoney/banks/what-allrbi-did-during-covid-19-4828.
- Misra, U (2020): "Explain Speaking: Why Atmanirbhar Bharat Abhiyan Economic Package Is Being Criticised," *Indian Express*, 21 May, https:// indianexpress.com/article/explained/explainspeaking-why-the-atmanirbhar-bharat-abhiyaneconomic-package-is-being-criticised-6414905/.
- Moharir, A (2022): "Fiscal Rules and Debt Dynamics in India," *Macroeconomics and Finance in Emerging Market Economies*, Vol 15, No 1, https:// doi.org/10.1080/17520843.2020.1796733.
- Mundle, S (2020): "The Long Road to Recovery That Lies Ahead for India's Economy," 20 August, Livemint, https://www.livemint.com/opinion/ online-views/the-long-road-to-recovery-that-liesahead-for-india-s-economy-11597935307031.html.
- Press Trust of India (2020): COVID-19: "FRBM Framework Will Need to be Updated, Says Former CEA Subracamanian," Indian Express, 3 June, https://indianexpress.com/article/india/covid-19-frbm-framework-will-need-to-be-updated-says-former-cea-subracamanian-6441362/.
- Rangarajan, C and D Shrivastava (2005): "Fiscal Deficits and Government Debt: Implications for Growth and Stanilisation," *Economic & Political Weekly*, Vol 40, No 27, pp 2919–933.
- (2018): "Are Fiscal Risks Increasing?" Hindu, 10 February, https://www.thehindu.com/opinion/lead/are-fiscal-risks-increasing/article22708161.ece.
- RBI (2020): Annual Report 2019–20, Reserve Bank of India.
- Roy, R and A Kotia (2018): "Should States Target a 3% Fiscal Deficit?" *Economic & Political Weekly*, Vol 53, No 9, pp 7–8.

Economic&**Political**WEEKLY

available at

Gyan Deep Near Firayalal Chowk, Ranchi 834 001 Jharkhand Ph: 09470564686