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PURPOSE AND ORGANIZATION

This 20th India Policy Forum 2023 Volume comprises papers and highlights of the discussions at the India Policy Forum (IPF) held on July 6-7, 2023. The IPF is organized by NCAER, the National Council of Applied Economic Research, India’s oldest and largest, independent, non-profit, economic think tank.

The IPF promotes original economic policy and empirical research on India. The IPF Editors commission both empirical research papers and policy-focused expert reviews, the latter also based on robust, original research. It provides a unique combination of intense scholarship and policymaker engagement at the annual IPF Conference that reviews this research, leading to its eventual publication in this international journal.

An international Research Panel of India-based and overseas scholars with an abiding interest in India supports this initiative through advice and active participation at the IPF Conference, and the search for innovative papers that promise fresh insights, especially from younger scholars. An international Advisory Panel provides overall guidance. Members of the two IPF panels are listed below.

Papers appear in this annual IPF Volume after revisions based on IPF discussants’ comments, a lively floor discussion, and the editorial guidance provided by the IPF Editors. To allow readers to get a sense of the richness of the conversations that happen at the IPF, edited discussants’ comments as presented at the IPF are included here. The 2023 volume also provides hyper-links to the video of each IPF session, including the floor discussion with IPF participants. Consistent with the editorial independence of the IPF, the papers and associated comments represent the views of the individual authors and do not imply agreement by the Governing Body, the IPF Editors, the management and staff of NCAER, or the IPF Panels.

The IPF 2023 also featured a Policy Roundtable titled, “The World in a Polycrisis”, along with the 5th T.N. Srinivasan Memorial Lecture, titled, “Poverty and Inequality in India: An Exploration of Undercurrents at the Village Level”, delivered by Prof Peter Lanjouw, VU University, and the IPF Lecture titled “Monetary and Macroprudential Policies with Global Financial Cycles”, delivered by Professor Hélène Rey, London Business School. The videos of the lectures are available at the hyperlink at the end of the Editors’ Summary.
Correspondence about papers in this *IPF Volume* should be addressed directly to the authors (each paper contains the email address(es) of the corresponding author(s)). All author affiliations in the papers are as of the IPF Conference. Feedback on the IPF Volume itself may be sent to: The Editors, India Policy Forum, NCAER, 11 Indraprastha Estate, New Delhi 110002, or by email to ipf@ncaer.org. More information on the IPF is available on www.ncaer.org, including links to downloadable previous IPF Volumes and videos of individual IPF sessions for the past several years.

**THE IPF TEAM**

NCAER is responsible for the development, planning, organization, editing, and publication of the India Policy Forum Volume. The Editors are deeply grateful to the following NCAER staff for their major contributions in the production of the IPF 2023 Volume:

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Editors’ Summary

The India Policy Forum (IPF) marked its 20th year with its conference in New Delhi on July 6–7, 2023. Established with the primary objective of promoting original policy and empirical research on India, the IPF Conference is a distinctive event that combines rigorous scholarship and commentary on research findings, with a focus on their policy implications. The revised papers presented at the conference are published in this journal, gaining from exposure to a broad international readership. Over the past two decades, interest in India has surged, resulting in a significant increase in original research on India being featured in global economic journals.

The IPF itself has evolved, accommodating more policy-oriented review articles that aim to offer sound policy advice grounded in robust empirical research. Additionally, it has introduced roundtable discussions and lectures addressing key policy issues that have shaped Indian economic policymaking and the economy in recent years. This annual journal includes the papers presented at the 2023 IPF Conference, along with comments from formal paper discussants and a summary of the floor discussions on each paper.

This Editors’ Summary provides concise summaries of the five papers presented at the IPF 2023 Conference, concluding with hyperlinks to the IPF 2023 program. These links extend to the Conference versions of the IPF 2023 papers, video recordings, and presentations from each IPF 2023 session, encompassing the IPF 2023 lecture, the 5th T.N. Srinivasan Memorial Lecture, the IPF Policymaker’s Lecture, and the IPF Policy Roundtable.

India’s Debt Dilemma

In this paper, authored by Barry Eichengreen, Poonam Gupta, and Ayesha Ahmed, it is argued that India exhibited unique fiscal patterns prior to the pandemic, deviating further toward high debt levels during the COVID crisis. The debt-to-GDP ratio is anticipated to persist at elevated levels, limiting resources for crucial priorities such as health, education, and climate change mitigation. At the same time, there is no immediate crisis of debt sustainability: institutional factors limit rollover risk, and interest rates have not risen with additional debt issuance. But financial stability and sustainability risks may arise in the future, and lack of resources to meet pressing needs is a drag on growth. Consolidation would require lower primary deficits achieved through tax revenue generation and privatization, all while protecting and prospectively increasing capital spending.
India’s public finances paint a mixed picture. Its fiscal deficits and public debts were among the highest in the developing world; its interest payment/GDP ratio and primary deficits were large before the pandemic. The pandemic reinforced these trends. At their peak in 2020-21, the debt and deficit stood at 89 and 13 per cent of GDP respectively. Contingent liabilities are estimated at an additional 5 per cent of GDP.

With the recovery of nominal GDP, the country’s debt and deficit ratios have fallen from these multi-decade highs. But at 84 and 9 per cent, respectively, they are still high relative to other emerging market and middle-income countries, where they average 60 and 5 percent, respectively. While India’s debt ratio is comparable or lower than in the advanced economies, this provides little comfort. Advanced-country governments enjoy lower interest rates and consequently have lower interest-payment-to-GDP ratios. Debt-to-GDP ratios of advanced economies averaged 112 percent in 2022, whereas interest payments averaged 1.5 percent of GDP. In contrast, India pays as much as 5 percent of GDP in interest on debt.

India’s deficit is thus more a problem of low revenues than one of high expenditure. The revenue-to-GDP ratio in India is below that of most other emerging markets and has seen the slowest rates of increase over the last 20 years. In contrast, the public-expenditure-to-GDP ratio is not atypical and, if anything, has increased more slowly. This gap has resulted in a perennially large, and an even increasing, budget deficit as compared to other emerging markets.

In this paper, the authors assess the sustainability of the public finances, with a focus on the next five years.

A first criterion for sustainability is whether there is significant rollover risk. The authors find that the institutional factors such as a captive market for public debt among State banks, private banks, insurance companies, and provident funds, together with household savings, have enabled the government to fund its deficits without undue pressure on borrowing costs. In addition, the currency composition and maturity of the debt limit rollover risk. Nearly 90 percent of General Government debt is long-term. There has been a concerted effort to reduce rollover risk by issuing long-tenor securities. As a result, the weighted average maturity periods for both Central and State government loans have been increasing. At the same time that the average maturity of public debt has risen, yields have declined, if slightly: The General Government weighted average coupon fell from 8 percent in 2011-12 to 7.3 percent in 2022-23.

In 2000-01, about 13.5 percent of Central Government debt was issued externally. Since then, there has been a steady decline in the share of external debt, which stood at just 3.7 percent in 2021-22. The remainder is long-term instruments, concessional, and owed to multilateral and bilateral investors (amounting to 3 percent of the total debt). Holdings of foreign institutional investors account for just 1 percent of the total debt. Foreign banks hold
negligible quantities of Indian government debt. Debt denominated in foreign currency dropped from about 10 percent of the total in 2002-03 to 4.3 percent in 2020-21. Consequently, the debt portfolio is largely insulated from currency risk.

A second criterion for sustainability is whether the debt ratio will remain stable. The authors confirm that, under reasonable assumptions, the debt ratio will remain broadly stable. This stability rests on the assumption of a largely unchanged primary budget deficit and a favorable growth-rate-interest-rate differential, the latter reflecting India’s positive growth prospects and also institutional factors limiting upward pressure on interest rates.

In sum, India’s general-government-debt-to-GDP ratio, which is high by emerging market standards, is unlikely to decline significantly in the next five years. In the best-case scenario, it might fall from its current level of some 90 percent of GDP to 80 percent of GDP. But less rosy scenarios are also possible. Smaller primary budget deficits will be difficult to achieve, given pressure for social and infrastructure spending, including on climate-change abatement and adaptation and the green transition, and the difficulty of boosting tax revenues. Faster growth rates or lower interest rates would be difficult to achieve.

There are costs and risks associated with India’s high debt and deficits.

First, interest payments absorb resources, limiting their availability for other economic and social purposes. Interest payments exceed 25 percent of general government revenues. At 5 percent of GDP, their share is twice the emerging market and developing-country average.

Second, available fiscal resources leave no room for meeting emerging priorities, notably climate change abatement and adaptation, and the green transition.

Third, debt dynamics leave little room for responding to shocks, such as declining rates of domestic and global growth. India was not strongly constrained in responding to COVID-19; it reacted with a fiscal stimulus of Rs 20 trillion, or roughly 9 percent of GDP. But at some point, responding in this way to shocks will begin to show up in interest rates, especially as regulations encouraging investments in bonds by insurance companies, provident funds and banks are progressively relaxed. Eventually, this will throw debt sustainability into doubt. Conversely, maintaining debt sustainability in the face of such shocks will leave the government countercyclically constrained, amplifying cycles.

Fourth, high government debt creates the potential for financial stability risks. For the moment, such risks remain limited. Banks are required to hold government securities in order to satisfy their Statutory Liquidity Ratios (SLR). Risks to their balance sheets can, therefore, develop with the re-pricing of these assets when interest rates rise. For the moment, India may be able to place most of its debt with “patient” domestic investors. But if this becomes less true going forward, risk—and volatility—will rise.
In purely mathematical terms, India could bring down its debt to 70 percent of GDP through a combination of lower primary deficits, higher inflation, and faster GDP growth. A percentage point increase each in growth and inflation and a percentage point reduction in the primary deficit would reduce public debt to 70 percent of GDP in five years. The requisite changes could be achieved through an amalgam of the following factors:

- Raising additional revenue through higher tax, non-tax, and privatization receipts. Along with better tax administration and digitalization, recent tax reforms (notably the introduction of a uniform Goods and Services Tax in 2017) have succeeded in modestly boosting revenue growth. Yet in a fast-growing economy, where nominal GDP has been growing on average at 11-12 percent, the rate of tax-revenue growth has still not exceeded that of GDP growth, in contrast to other fast-growing emerging markets. More could be done along these lines, both through additional digitization and administrative streamlining, and through the adoption and better administration of new taxes, such as a tax on property at the State or Central Government level (though the political economy of the latter is obviously challenging).
- Continuing to re-orient spending toward capacity and infrastructure-enhancing investment that promises to further boost GDP and revenues.
- Limiting contingent liabilities, which have been a chronic problem at the State level.

However, imagining sharp changes along these lines borders on wishful thinking. Economic and social development will require additional spending on health and education. The Government will have to contribute significantly to the country’s decarbonization and climate-change-adaptation investments, which are large by international standards. Eventually, interest rates will adjust upward in response to inflation, eliminating any favorable debt-consolidation effects. As a result of these factors, India will almost certainly be living with high public debt for years to come.

Is Electrification in India Fiscally Sustainable?

This paper by Prabhat Barnwal and Nicholas Ryan suggests that electrification has been a landmark of economic development for more than a century and electricity continues to find new uses today. The Government of India, after decades of effort and investment, in 2019 declared household electrification to be complete. The historic completion of household electrification in India is a feat not mainly of engineering but of fiscal capacity, and specifically cooperation
across the Central and State governments. Electrification has been achieved through large Central investments and transfers, despite the fact that the State distribution companies (discoms), without accounting for subsidies, continue to run large losses. The State discoms that supply electricity in India have for long been in poor fiscal health and set a weak foundation for the revenue flows that sustain all segments of the electricity sector.

The main risk in the electricity sector in India is that universal electrification, and electricity supply for all households and businesses, still rests on the same unsteady foundation of discom finances. Gains in electrification and increases in power supply may, therefore, strain discoms’ fiscal health and lead to backsliding: increased, rather than reduced, dependence on the Centre and State government transfers, and deteriorating efficiency, costs of supply, and reliability of service.

This paper takes on three goals. First, the authors describe the recent history of Central investments in, and bailouts of, State discoms. Second, they describe the results achieved at an aggregate level as far as the financial and operating conditions of those companies are concerned. Third, they suggest Direct Benefit Transfers for Electricity as a major policy reform whose time has come and which would address the structural dependence of State discoms on the State and Central governments.

The examination of past reforms shows that, up to now, Central intervention in the distribution sector has expanded electrification but has never succeeded in imparting a commercial orientation to the distribution companies. Since 2000-2001, there have been at least four large-scale Central fiscal bailouts of the power sector, each on the scale of 1 to 1.5 percent of GSDP, totaling Rs 35 lakh crore of expenditure in 2022 rupees. Each of these bailouts has been accompanied by a large program of direct Central investment in the distribution sector, including, repeatedly, investments in the expansion and strengthening of the distribution network, metering, and energy accounting. These Central investments have added an additional Rs 5 lakh crore of Central investment in distribution, across a range of succeeding electrification programs—the figure is the sum total of scheme outlays for Integrated Power Development Scheme (IPDS), Rajiv Gandhi Grameen Vidyutikaran Yojana (RGGVY), Deendayal Upadhyaya Gram Jyoti Yojana (DDUGJY), Pradhan Mantri Sahaj Bijli Har Ghar Yojana (Saubhagya), Restructured Accelerated Power Development and Reforms Program (RAPDRP), and Revamped Distribution Sector Scheme (RDSS).

These investments have helped bring about large improvements in real outcomes, including electrification rates and power supply. Yet, they have not solved, and may have prolonged, the basic structural dependence of State discoms on the State governments and the Central government. State discoms continue to run high operating losses and perform badly on many measures of efficiency. The basic incentive problem is that State discom losses are covered
by a combination of States and the Centre, through investment and operating subsidies and periodic bailouts, and hence, the discoms themselves do not bear the cost of their inefficiencies.

The second part of the paper studies discom finances over the last decade. The paper presents three main findings. First, in FY 2021-22, India’s State discoms lost Rs 1,79,000 crore excluding subsidy support from the State and Central governments, or about 22 percent of expenditures on power, down slightly from 27.5 percent of expenditures on power in FY 2011-22 (though roughly tripling in absolute terms, from Rs 64,000 crore in the base year). The authors prefer to look at distribution company finances excluding subsidies in order to separate improvements in revenue from customers from government support. Losses inclusive of subsidies are hard to judge, since it is possible that discoms over-book subsidies to agriculture, in particular, in order to paper over technical losses or unbilled power. Even after removing subsidies, stated discom losses are still subject to criticism, on the grounds that they book as accrued revenue some receivables that may not, in fact, be paid by customers or State governments in the future.

The second finding in the paper, the main bright spot in recent years, has been a formalization of discom losses as explicit State subsidies. Traditionally, most losses were accumulated on discom books and only occasionally recognized by States, at the time of bailouts, via debt restructuring with Central government supervision and aid. This belated recognition arguably encourages inefficiency and waste since it has been cheaper for States to finance subsidies through discom debt, with an expectation of State and Central relief, than to do so directly. Under the Ujjwal Discom Assurance Yojana (UDAY) scheme, launched in 2015, States were compelled not only to assume past discom debts but also to take on debts that discoms may incur in the future. The authors find that this incentive, in combination with other factors, may be working. State governments in most States are bringing discom losses on to their books with ex-ante budget allocations for subsidies.

The third finding in the paper is that despite this improvement in budgeting, the UDAY scheme is not associated with improvements in operational performance. The authors find that State discoms that took UDAY funds, contrary to the goals of the program, saw a deterioration in Aggregate Technical and Commercial (ATC) losses and billing efficiency over the five years, following the launch of UDAY in 2015, relative to States that did not draw funds under UDAY. They find that UDAY grants had no effect on the ACS-ARR gap for discoms. This result may be a combination of States with worse performance choosing to take UDAY funds and UDAY itself enabling poor performance; the analysis in the paper cannot differentiate the root cause, but it is clear that the goals of the scheme in improving operational efficiency were not achieved.

In the final part of the paper, the authors advocate for a reform program centered on one main policy: Direct Benefit Transfers for Electricity (DBTE).
The aggregate value of electricity subsidies in India, at Rs 1.6 lakh crore per annum and growing, is more than the combined expenditure on the Mahatma Gandhi National Rural Employment Guarantee Program (MGNREGP) (Rs 61,500 crore) and the Pradhan Mantri Kisan Samman Nidhi (PM-Kisan) (Rs 75,000 crore). If this electricity subsidy were converted to DBT, it would not be new expenditure, but rather a redirection of subsidy support from discoms directly to customers. This redirection is likely to have large benefits in improving efficiency and bringing down the cost of power in the sector as a whole.

Direct benefit transfers, in principle, are the most efficient means of delivering benefits to households and to farmers: they reduce waste and can provide incentives to conserve. India’s experience with DBT for LPG subsidies provides a motivating example of an at-scale policy reform that addressed chronic structural problems in energy distribution. The authors argue that DBT is essential to fix the structural problem in the electricity sector, and that discoms do not have to serve customers to survive due to their dependence on the State and Central governments. Under DBT, with subsidy funds flowing only through customers, discoms would have to improve the reliability and quality of service to collect revenue from the customers they serve. This single step would go far to re-orient the discoms towards more efficient operation and customers towards judicious use of power, lowering costs in the sector as a whole.

Recent investments in the electricity sector and beyond make DBTE viable on a mass scale. These include: the formalization of State electricity subsidies; existence of the Aadhaar platform for financial transfers to households and farmers; and the funding for universal smart metering under the Rs 3 lakh crore RDSS. The authors review the experience with DBTE from two pilot programs for agricultural customers in Rajasthan and Punjab. They find that acceptance of DBTE is high among enrolled farmers and that DBTE is estimated to both conserve electricity and reduce subsidy expenditures at the same time. They lay out a design template for States to adopt DBTE for domestic and agricultural consumers and suggest channels through which the Center may encourage such adoption.

**Workers, Managers, and Productivity: How Investments in Workers Can Fuel India’s Productivity Growth**

In this paper, authors Achyuta Adhvaryu, Smit Gade, Jean-François Gauthier, Anant Nyshadham, and Sandhya Srinivas elaborate on India’s manufacturing sector and how it is widely held as a key to the ongoing structural transformation of its economy, the pathway for millions of low-income Indians to grow their
incomes out of poverty, and India’s overall economic competitiveness on the global stage. Indian manufacturing is particularly important, given the accelerating global demand to shift supply chains away from China. The United States, the European Union (EU) countries, and other large economies view India as a primary destination towards which key aspects of global production could move. But absorbing this potential demand would require a massive expansion of manufacturing capacity within India. Raising manufacturing’s share of GDP in the coming decade is a key stated goal of the Government of India. The Government’s “Make in India” push—to reduce dependence on China and other major sources of imports—also aligns with the emphasis on manufacturing growth. These goals consequently imply that manufacturing productivity is of critical importance as India wishes to position itself as a major player in the global “friendshoring” trend, as well as for India’s own desire to be more self-reliant in the production of consumer goods.

The authors thus begin by examining trends in India’s manufacturing productivity, with the goal of establishing some basic stylized facts related to aggregate productivity growth and the dispersion in productivity across States and industries. Their takeaway from these statistics is that the growth in manufacturing productivity, as measured by sales per worker, has slowed considerably in the past decade, particularly in the several years leading up to the start of the COVID-19 pandemic in 2020. To elaborate, data from the Annual Survey of Industries (ASI) illustrates a strong decline in manufacturing productivity growth since the 1990s, with an acceleration of this decline starting in the mid-2010s. The growth rate, which oscillated between 10 to 15 percent in the 1990s and 2000s, began to stagnate post-2015, indicating an alarming slowdown in the productivity growth of Indian manufacturing firms.

Moreover, a comparative study reveals that Indian manufacturing productivity is significantly lower than that of the United States. In 2020, Indian productivity was approximately a fifth (three-fifths) of the US levels (when adjusting for differences in purchasing power parities). There is also considerable heterogeneity in productivity across Indian States: States in Western and Central India tend to have the highest average productivity, while States in the East and South have the lowest. These cross-State differences persist when controlling for State industrial composition. The data illustrates significant dispersion in manufacturing productivity across different Indian States, but also within industries. For example, the average sales per worker in the 10th percentile amounts to approximately $24,000, as compared to $145,000 in the 90th percentile. These differences hold even after adjusting for the composition of industries within each State, indicating that factors beyond industrial composition are driving these differences. More generally, in alignment with the large economics literature on productivity dispersion, the difference in productivity across the most and least productive firms is vast in India, even after controlling for State and industry effects.
Furthermore, the investment in workers, as measured by emoluments (wages plus all goods or services provided to employees), appears to be a pivotal factor in manufacturing productivity. The data exhibits a robust positive correlation between productivity and the investments made by firms in their workforce. This correlation stands even when accounting for firm size and adjusting for State and industry differences. The presented stylized facts spotlight the idea that making strategic investments in the workforce can potentially lead to substantial improvements in productivity. They also highlight that addressing the substantial disparities in productivity across different States and industries is imperative for the sustainable development of India’s manufacturing sector.

The positive correlation between investments in workers and productivity is substantial, but it is important to recognize that this relationship may not be purely causal. Factors such as unobserved firm choices could be linked to both the provision of wages and benefits to employees and productivity. Next, the authors delve into several categories of investment in workers and assess the causal evidence of their impacts on productivity through a review of studies employing prospective randomized controlled trials or using credibly exogenous variation.

One of the focal areas of investment is in enhancing soft skills among workers. Soft skills such as communication, time management, problem-solving, and teamwork have been shown to have significant contributions to productivity and labor earnings. This is especially crucial in the manufacturing sector, where traditionally the emphasis has been on technical skills. Programs like the Personal Advancement and Career Enhancement (P.A.C.E.) program in India, which trains female garment workers in soft skills, have demonstrated increases in productivity by as much as seven percentage points and retention rates.

Another aspect explored is the voice of employees within the organization. Encouraging employees to voice their concerns can strengthen the relationship between them and their employers, which leads to increased productivity by reducing turnover, motivating employees, and improving communication. For example, when auto workers in China participated in evaluating their managers, it resulted in a 50 percent reduction in turnover, raising overall productivity and employee happiness. Similarly, implementing an SMS-based communication tool in Indian garment factories led to reduced absenteeism and attrition by 5 percent and 10 percent, respectively, improving productivity by 7.2 percent.

The physical environment and working conditions are also key areas of investment. Pollution and extreme heat can have detrimental effects on workers’ health, subsequently impacting productivity. By adopting cooling technologies and energy-saving methods, like LED lighting, Indian garment firms created a conducive working environment that positively impacted productivity, reducing by 85 percent the negative impact of temperature on hot days.
Managerial quality is another critical area of investment. In the same setting, managers attentive to productivity changes from their workers due to pollution, respond by reconfiguring production lines to mitigate these negative impacts. Customized training focusing on leadership and communication skills of garment production managers has also been shown to enhance productivity by as much as 6 percent. Effective managerial practices such as performance monitoring, information sharing, and focusing on long-term impacts can lead to increased productivity through improved quality, efficiency, and organizational learning. However, it is important to note that there may be resistance to changing practices, and programs must be carefully designed to align with the firm’s specific needs and the skill levels of the managers.

Investments in employees—encompassing soft skills, employee voice, environmental conditions, health, and managerial quality—have all been shown to have potential causal impacts on productivity, which can be encompassed in carefully designed interventions that consider the specific needs and contexts of the firms.

Finally, the paper ends with a discussion of a variety of reasons as to why firms may under-invest in their employees. One notable barrier is information friction; firms might either lack awareness or under-estimate the potential benefits of investing in employees. In particular, information about the advantages of investment might not reach the relevant decision-makers within the firm, due to communication hurdles. Another impediment is potentially the risk-averse nature of decision-makers who, owing to uncertainty in investment outcomes, may hesitate to make potentially profitable investments, especially in resource-constrained settings.

Managerial attention can also be an important limiting factor. The plethora of responsibilities that managers have often means that adequate attention is not given to evaluating and implementing strategies of worker investments. Another likely barrier is the misalignment of incentives across different levels within the firm. The varied interests within the organization might lead to resistance or slow the adoption of profitable practices if they don’t align with the interests of certain individuals or departments.

Moreover, high employee turnover rates can make firms reluctant to invest in employee training, particularly in general skills that are transferable, as they may not see immediate benefits from these investments. Market dynamics also play a role here since in highly competitive labor markets, firms might be dis incentivized from investing in training as employees might use these skills to move to other competing companies.

Understanding and addressing these barriers and market factors is essential to encourage firms to invest in their workforce. There is an imperative need for more in-depth research to fully understand firm behavior in relation to employee investment to unlock better productivity and mutual benefits for both firms and employees.
Ten Facts about Son Preference in India

In this paper, author Seema Jayachandran summarizes key facts and recent evidence on son preference in India. She lays out ten facts and then discusses some policy options.

One dimension of son bias is providing more inputs, such as health care or education, to sons than daughters; in this paper, the author focuses on health.

1. Gender gaps in child health inputs and outcomes have narrowed in recent years.

Analysis of India’s National Family Health Survey (NFHS) demonstrates this trend. For example, the female ratio in vaccinations has risen over the past thirty years. Similarly, excess infant mortality among females in India has declined in recent years. For infant mortality, it is useful to benchmark India against other countries because male infants are more fragile, so parity does not correspond to lack of discrimination. The author compares India to other countries with Demographic and Health Surveys collected around the same time as the relevant NFHS wave. For comparison countries, the female-male infant survival ratio is 1.01 around both the 2005-06 period when NFHS-3 was fielded and the 2019-21 period when NFHS-5 was fielded; this appears to be the “natural” rate. In NFHS-3, India’s ratio was 0.99, equivalent to 2 excess deaths per 100 girls born, while NFHS-5 data suggest that India’s deviation from comparison countries has mostly disappeared.

Rising family income might have disproportionately helped girls because they started out behind. Policies and interventions that were not explicitly gendered might have helped too. Increased childbirth in health facilities and providing postnatal checkups through home visits might especially help girls because they would otherwise receive less health care when families have explicitly made a trip to a health facility for their care.

2. Nonetheless, girls remain disadvantaged in important ways.

Despite these cases of positive trends, several recent studies document that girls continue to fare worse than boys in health inputs such as dietary diversity and healthcare seeking. For example, Dupas and Jain (2023) analyze claims data from Rajasthan’s Bhamashah Swasthya Bima Yojana Health Scheme (BSBY) health insurance program that offers enrollees free care in public and private hospitals. They find that girls represent only 33 percent of hospital visits among children under 10 years.

3. Unfortunately, making health services free might not be enough to close the remaining gender gaps.

Many of the health gaps exist despite the health services being free to families, such as the evidence on BSBY above. Other health inputs without a direct monetary cost also show gender gaps, such as breastfeeding and parental time spend on childcare. How can policy offset parents’ time and hassle costs to obtain health care for their daughters? In the case of medical care, policy options include reimbursement for travel costs. One could offer incentives for care, but this could encourage over-use of medical care. An alternative is to reward the outcome: payments for having healthy girls, for example, as measured by anthropometrics or anemia levels.

4. In addition to gender gaps, there are also stark health gaps between eldest sons, who tend to be favored, and other sons.

Jayachandran and Pande (2017)\(^2\) reported that the anomalously high rate of stunting in India is almost as stark among non-eldest sons as among girls, but nearly absent among eldest sons. This pattern of eldest sons doing better than non-eldest sons continues to be true in more recent data, and a similar disadvantage for non-eldest sons is also seen for infant survival.

5. The desire to have a son—to play that eldest son role in the family—is what drives the skewed sex ratio.

A well-known pattern of the skewed sex ratio is that it is concentrated on last births in the family, in cases where the previous children are daughters. This pattern is consistent with the premium on having at least one son, which differs from a general aversion to having daughters (for example because of dowry expenses), which might lead to a high rate of sex selection even for first births.

A compelling way to see the link between eldest son preference and sex selection comes from studying patrilocality, the practice whereby a married couple joins the husband’s family and resides near or with his parents. This system creates a strong perceived need to have a son so that he can support and care for them in old age. Ebenstein (2014)\(^3\) shows the strong association between the practice of patrilocality and the male-skewed sex ratio across and within countries.

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6. Unlike gender gaps in child investment, the desire to have a son shows little sign of abating.

Two measures of the desire for a son are the sex ratio of last births, which is the sex ratio for the final child in a family, and the population sex ratio. India is exceptional compared to other countries on both metrics, and this pattern has been persistent.

7. The downward trend in family size is exacerbating how the desire for a son translates into sex selection.

The fertility squeeze is the idea that when family size is smaller, fewer families will have at least one son naturally. When parents want to have three or four children, the likelihood of naturally ending up with no sons is relatively small, but this scenario becomes more likely when couples want to have two or even just one child. Therefore, as couples’ desired family size gets smaller, they are more likely to resort to sex-selective abortions to obtain their desired son.

8. Families’ quest for a son also has collateral damage on his sisters’ health.

Girls sometimes receive fewer inputs than boys as a by-product of fertility choices around obtaining a son. One channel for this is through family size. A couple whose first two children are both sons, by chance, is more likely to stop having children than if the first two children are girls. The second family will keep trying to have a son. Girls, on average, grow up in larger families via this type of fertility behavior. Given fixed financial resources, girls will be raised in families that have fewer resources to spend on each child. Thus, even if, within the family, boys and girls receive equal inputs, because of cross-family difference, girls will receive fewer resources.

Another phenomenon, shown by Jayachandran and Kuziemko (2011), is that because women in India want to and are more likely to become pregnant again after a daughter is born, they stop breastfeeding girls sooner to regain their fecundity or because of the new pregnancy. This is detrimental to girls because of the health benefits of breastfeeding. Here, the harm to girls arises without parents having an explicit preference to provide more health inputs to sons.

9. Empowering women is not a panacea that will solve the problem of son preference.

What policies can mitigate son preference? Addressing the skewed sex ratio is especially challenging. The fact that the skewed sex ratio is exacerbated

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when family size is smaller upends some standard intuitions about policy solutions. For example, educating girls so that they grow up to be empowered mothers might perversely worsen the sex ratio. This is because there are two offsetting effects: education reduces son preference at any given family size, but it also decreases desired family size, and a smaller family size implies a more skewed sex ratio if it remains important to many women to have at least one son. Therefore, a progressive force like female education does not seem to improve the sex ratio (even if it is valuable \textit{per se} and has other benefits for girls’ outcomes).

10. Offering financial incentives to have daughters risks further concentrating girls in poorer families.

A widely used approach to address the skewed sex ratio in India is to offer financial incentives to have daughters. There are at least three limitations of this approach. First, it can be an expensive solution because most of the payments are infra-marginal, or to couples whose behavior is unchanged by the incentive. Second, offering payment to have daughters could crowd out the intrinsic valuation of daughters. The third, and perhaps most worrisome limitation of such programs, is that most of the increase in the birth of girls will be in poor families. Many government schemes limit participation to poor households, but even without such a restriction, a given payment level will be more influential for fertility choices for a poor family than a rich one.

What policies, then, can work? We do not really know, but there are several policies that warrant pursuing or testing. Enforcement of the Pre-Conception and Pre-Natal Diagnostic Techniques (PC-PNDT) Act that bans sex-selection should continue to be a priority. Other policy options include ramping up delivery of health inputs and health care through schools, public pensions as an alternative to old-age support from sons, and policies that strengthen the intrinsic value that Indian families place on girls.

The Past and Future of Indian Finance

In this paper, author Ruchir Agarwal suggests that India’s growth story depends on the vitality of its financial system. Within the span of five years, the Indian economy has endured two unprecedented shocks: the 2019 economic slowdown triggered by a financial crisis, and the COVID-19 pandemic. As we navigate the aftermath of these episodes, one vital question emerges: how resilient will India’s financial system be in the face of future challenges?

In this context, this paper embarks on three missions. First, it examines the origins and aftermath of the 2018-20 Indian Financial Crisis, sparked by a run on the shadow banks. On the eve of the pandemic, India was already grappling
with a major economic slowdown. By March 2020, marking the end of the 2019-20 fiscal year’s last quarter, GDP growth had steeply fallen to just 2.9 percent, a stark contrast from the 7 percent decade average. For the first time in over a decade, aggregate investment—accounting for a quarter of GDP—experienced continuous contraction, declining by more than 4 percent over three successive quarters. This paper asserts that the Indian Financial Crisis of 2018-20 was the primary driver of this slowdown, highlighting the financial system’s critical role in India’s growth story.

Second, the paper examines how India fortified its financial system in the wake of the financial crisis and the pandemic, consequently shielding itself from the global banking disruptions of 2023.

Finally, the paper gazes ahead at potential challenges and opportunities, sketching a blueprint for key reforms.

The paper’s key takeaway: The future trajectory of Indian growth, whether a modest 5.5 percent or a bold 7.5 percent, rests significantly on the progress of ongoing financial sector reforms.

**Recent History: A Financial Snapshot**

Historically, development banks or all-India financial institutions have been pivotal in providing long-term infrastructure lending. However, in the 1990s, several significant development banks faltered. This led to Public Sector Banks (PSBs) assuming a more dominant role in infrastructure lending.

Throughout the 2000s, there was a surge in infrastructure lending in India due to the country’s escalating infrastructure requirements. Public-private partnerships thrived during this period, and Indian banks, especially PSBs, ramped up their project finance involvement. By 2014, due to their widespread presence nationwide and their significant role in infrastructure lending, PSBs provided about 70 percent of total bank credit to the real economy.

This period also marked significant growth in total bank lending from both private and public banks. From 2005 to 2013, the total bank lending expanded by over 15 percent annually in real terms. Notably, banks’ engagement in major infrastructure projects continued to rise, even against the backdrop of the global financial crisis of 2007-09.

However, by the early 2010s, the banking system faced challenges. Governance lapses in infrastructure projects significantly increased the risk of stressed assets in PSBs, and the system experienced a credit misallocation problem known as loan evergreening or “zombie lending”. Under-capitalized banks rolled over loans to large, struggling borrowers to avoid declaring them as Non-Performing Assets (NPAs). By 2016-17, these large borrowers constituted over half of the bank loan portfolios and almost 90 percent of NPAs in the banking system.
Recognizing the severity of this challenge, the Reserve Bank of India (RBI) prioritized addressing the NPA problem in the mid-2010s. A pivotal development was the Asset Quality Review, a regulatory exercise aimed at identifying and rectifying discrepancies in loan classification by banks. This process revealed substantial under-reporting of NPAs, leading to a collapse in public bank lending. The sudden decline in credit availability created a vacuum that spurred the growth of shadow banks, or Non-Bank Financial Companies (NBFCs), which witnessed a surge in lending activity.

The subsequent demonetization on November 6, 2016 impacted the financial system by inducing an abrupt and substantial reduction in cash circulation. This move generated both short-term and long-term effects on various sectors, including shadow banking and real estate. Despite the initial liquidity crisis, demonetization indirectly benefited shadow banks by increasing deposits in the formal banking system and lowering interest rates, thereby boosting demand for credit from NBFCs.

The Indian financial system faced additional challenges with the high-profile defaults of Infrastructure Leasing & Financial Services (IL&FS) and Dewan Housing Finance Limited (DHFL) in 2018 and 2019, respectively, exposing the vulnerabilities within the shadow banking sector. These defaults set off a contagion effect, culminating in a liquidity crisis and loss of confidence in NBFCs, ultimately intensifying the economic slowdown.

The COVID-19 pandemic struck at a time when the Indian financial system was already grappling with these vulnerabilities. The pandemic’s unprecedented disruption to economic activity and trade led to widespread job losses, business closures, and further strain on an already fragile financial sector. The government and the RBI implemented several unprecedented measures to cushion the economy. These included fiscal stimulus packages, moratoriums on loan repayments, and liquidity injections. However, the pandemic also introduced new challenges, including a delay in the repair of the financial system that was needed after the shadow banking crisis.

As the country navigates the post-pandemic landscape, it is crucial to address both pre-existing issues and those that emerged during the pandemic to ensure a resilient financial system capable of supporting India’s growth and development goals.

The Indian Financial Crisis of 2018-20

The events that unfolded in India between September 2018 and March 2020, though not widely recognized at the time, bear the hallmarks of a financial crisis. This notion may court controversy, but the paper examines why it holds true.

A financial crisis is often characterized by severe disruptions in financial intermediation, widespread defaults, and panic-driven runs on banks. During this period in India, an unusual run on shadow banks occurred. Large institutional
depositors withdrew from mutual funds, leading to a startling contraction in funding for commercial paper and debt markets, thereby disrupting financial intermediation. The subsequent defaults by IL&FS in September 2018 and DHFL in June 2019 caused a palpable sense of panic in the market, akin to a traditional bank run leading to severe economy-wide damages. In labeling this a ‘financial crisis,’ the author’s intent is not to alarm but to inspire a deeper exploration of these events.

India’s shadow bank run differed from a classical bank run, with large institutional depositors (e.g., corporates) withdrawing placements in mutual funds, which in turn, ran on shadow banks by withdrawing funding from commercial paper and debt markets. Two system-wide runs occurred within months of each other, each triggered by a shadow bank default: Infrastructure Leasing and Financial Services Limited (IL&FS) in September 2018, and Dewan Housing Finance Corporation Limited (DHFL) in June 2019.

The total loss mutual funds incurred because of their exposure to IL&FS and DHFL was around Rs 0.025 trillion for each, adding up to roughly 0.2 percent of mutual fund assets or 0.01 percent of GDP. However, these minor exposures caused major stress, resulting in similar dynamics as traditional bank runs. This led to massive system-wide outflows from the mutual fund industry. In response, mutual funds drastically cut funding to shadow banks, which subsequently reduced credit flows to the real economy. Due to inter-linkages between traditional and shadow banking systems, problems spread to traditional banks after DHFL’s default, causing a steep decline in lending.

This raises two central questions regarding India’s economic slowdown. First, why did the defaults lead to system-wide stress and such large outflows from mutual funds? Second, why did a relatively small shock have such a large, negative, economy-wide impact?

The paper seeks to answer these questions by examining the mechanisms that: (1) led to the two system-wide runs on the shadow banking system, and (2) amplified these runs economy-wide. The explanation revolves around a series of mechanisms that the author refers to as ‘India’s macro-financial spiral’.

In brief, the IL&FS group defaulted on its debt obligations in September 2018. Rated AAA until its default by some credit rating agencies, the default shocked the financial system. Fears and uncertainties about hidden vulnerabilities in NBFCs and infrastructure/real estate sectors led lenders to reassess risks.

This initiated a flight to safety, starting with a system-wide run on the shadow banking system. The reasons include varying practices across mutual funds in valuing IL&FS debt and inconsistent timing of haircuts on such securities. This created a first-mover advantage, similar to a classic bank run, prompting investors to withdraw from mutual funds.

Limited funding access forced NBFCs to hoard liquidity and reduce new lending, impacting borrowers and real estate developers. As a result, credit growth slowed down, affecting the real economy, especially those sectors that
relied heavily on shadow banking for credit. The real estate and construction sectors were hit particularly hard, given their dependence on NBFCs and HFCs for financing.

The slowdown in the real estate and construction sectors led to a decrease in aggregate demand, putting further stress on the economy. This economic stress, in turn, led to lower corporate revenues and reduced repayment capacity, increasing the risk of further defaults in the shadow banking system.

The increased risk of default fueled the flight to safety, reinforcing the cycle of stress in the financial system. This feedback loop between the financial system and the real economy created a macro-financial spiral, amplifying the impact of the initial shock from the defaults of IL&FS and DHFL.

A few months later, the default of DHFL restarted this spiral, with the impact this time also spreading to banks, as the default of DHFL deepened worries about the entire financial system’s cross-exposures to the troubled NBFC and the real estate sectors.

During this period, there was a significant contraction in domestic lending to the private sector, which fell from nearly 10 percent of GDP in FY2018–19, to roughly 3 percent in FY2019–20 (i.e., excluding funds from the capital markets).

**Fighting the Crisis and the Pandemic**

In Part IV of the paper, the author reviews the government’s 2018 and 2019 policy responses, as well as the COVID-19 emergency response and significant policy reforms from the past five years.

From implementing accommodative monetary policies and emergency liquidity provisions to introducing loan repayment moratoria and credit guarantee schemes for MSMEs, the authorities implemented a wide range of measures to fortify the economy. These measures were instrumental in strengthening the financial system and ensuring its continued functioning even in the face of unprecedented challenges.

Moreover, these concerted efforts did more than just strengthen the financial system domestically. They also acted as a protective shield, insulating the Indian financial system from the adverse circumstances that led to the collapse of several Western banks in 2023.

While the global banking sector was grappling with a series of bank failures after the default of Silicon Valley Bank in March 2023, the Indian financial system, fortified by proactive repair and restructuring initiatives, demonstrated resilience. The focus on addressing asset-liability mismatches after the IL&FS default, along with different business models, and the recent restructuring of potentially weak links (such as Yes Bank), ensured that Indian banks were well-prepared to weather the global banking storm.
**Reform Priorities**

In Part V of the paper, the author highlights three central challenges facing India: (1) Addressing the funding imbalance between traditional and shadow banks (‘The Great Funding Imbalance’); (2) Expanding credit accessibility across the country (‘The Financial Deepening Hurdle’); and (3) Striking the right balance between economic growth, financial stability, and nurturing national champions (‘The Growth Strategy Trilemma’). He also discusses the potential opportunities arising from India’s digital payments revolution and ways to leverage reforms like the 2016 Insolvency and Bankruptcy Code.

To tackle these challenges, the paper posits a reform agenda centered on ten policy areas: strengthening regulation and supervision; managing systemic risk; improving asset quality; enhancing the framework for bad loans and bankruptcy; reforming public sector banks; restructuring the financial sector; deepening the financial sector; improving monetary policy transmission; improving the emergency liquidity framework; and supporting real estate transactions. Through these reforms, India can lay the groundwork for a more resilient and stable financial system that bolsters long-term growth and development.

**The 2023 IPF Lecture, the T.N. Srinivasan Memorial Lecture, and IPF Policy Roundtable**

The 2023 IPF Lecture on “Monetary and Macroprudential Policies with Global Financial Cycles” was delivered by Hélène Rey, Lord Bagri Professor of Economics at London Business School. This session was chaired by Suman Bery, Vice Chairperson, NITI Aayog, in the rank and status of a Cabinet Minister.

The 2023 IPF also hosted the 5th T.N. Srinivasan Memorial Lecture. Professor Srinivasan, who passed away in November 2018, was one of the IPF’s most ardent supporters, not missing a single IPF over its first 15 years. His persistent focus on the quality of data and empirical analysis remains a guiding theme for the IPF. The 2023 T.N. Srinivasan Lecture, titled “Poverty and Inequality in India: An Exploration of Undercurrents at the Village Level” was delivered by Peter Lanjouw, Professor in Development Economics at the Vrije Universiteit Amsterdam. His research focuses on the analysis of poverty and inequality as well as on rural development, notably the study of a village economy in rural India and the broader analysis of rural non-farm diversification. The lecture was chaired by Sonalde Desai, Professor at NCAER and Distinguished University Professor in Department of Sociology at the University of Maryland, with welcome remarks by Surjit Bhalla, member of the Research Advisory Board of NCAER and former Executive Director for India, Sri Lanka, Bangladesh, and Bhutan at the IMF.
The 2023 IPF Policymaker’s Lecture titled, “Discretion Is the Bitter Part of Advice”, was delivered by Bibek Debroy, Chairman, Economic Advisory Council to the Prime Minister (EAC-PM). It was followed by the IPF Policy Roundtable, in which Martin Wolf, Associate Editor and Chief Economics Commentator at the Financial Times, London, delivered a keynote speech on “The World in a Polycrisis”. The roundtable was moderated by Arvind Panagariya, Professor of Economics and Jagdish Bhagwati Professor of Indian Political Economy at Columbia University, with panelists V. Anantha Nageswaran, Chief Economic Adviser to the Government of India, and Montek Singh Ahluwalia, former Deputy Chairman of the Indian Planning Commission.

The videos of the IPF 2023 Lectures and Policy Roundtable are hyperlinked to the IPF program, which is available by clicking on this QR Code or visiting the URL: https://www.ncaer.org/wp-content/uploads/2023/07/Agenda-and-Papers.pdf

To view the IPF program with hyperlinks to all IPF papers, slide presentations, and videos of all sessions, scan this QR code or use the following URL:
https://www.ncaer.org/IPF2023/Agenda.pdf
ABSTRACT India was an outlier on fiscal outcomes pre-pandemic, before drifting further in the high debt direction during COVID. High levels of debt limit the resources available for other priorities such as health, education and climate change abatement. At the same time, there is no immediate crisis of debt sustainability: institutional factors limit rollover risk, and interest rates have not risen with additional debt issuance. But financial stability and sustainability risks may arise in the future, and lack of resources to meet pressing needs is a drag on growth. Consolidation would require lower primary deficits achieved through tax revenue generation and privatization, all while protecting and prospectively increasing capital spending. Contingent liabilities pose risks to the public finances of the States and should be minimized by fiscal-management reforms. As their debt manager, the RBI should allow States to face the market interest rates warranted by current and projected debt levels. Financial Commissions should be strengthened so as to provide stronger incentives for prudence.

Keywords: Debt Management, Debt Sustainability, Finance Commission, Fiscal Deficit, Public Debt

JEL Classification: H6, H7, H61, H63

1. Introduction

India’s public finances paint a mixed picture. The country was an outlier in fiscal outcomes before the pandemic. Its deficits and debts were among the highest in the developing world; its interest payment/government
revenue and interest payment/GDP ratios were large. The pandemic reinforced these trends. At their peak in 2020-21, the debt and deficit stood at 89 and 13 percent of GDP, respectively. (Contingent liabilities—the present value of the prospective stock—are estimated at an additional 5 per cent of GDP). With the recovery of nominal GDP, the country’s debt and deficit ratios have fallen from these multi-decade highs. But at 84 and 9 percent, they are still high relative to other emerging market and middle-income countries, where they average 60 and 5 percent, respectively.\footnote{These numbers and the categorization of countries, 95 in number, as “emerging-market and middle income” are from the IMF’s \textit{Fiscal Monitor}, April 2023. The fiscal year runs from April to March. For example, fiscal year 2023-24 refers to April 1, 2023-March 31, 2024.}

In this paper we assess the sustainability of the public finances, with a focus on the next five years.

A first criterion for sustainability is whether the debt ratio will remain stable. We confirm, under reasonable assumptions, that the debt ratio will remain broadly stable. This stability rests on the assumption of a largely unchanged primary budget deficit and a favorable growth-rate-interest-rate differential, the latter reflecting India’s positive growth prospects and also institutional factors limiting upward pressure on interest rates. The institutional factors in question include a captive market for public debt among state banks, private banks, insurance companies and provident funds. Together with household savings, these have enabled the government to fund its deficits without undue pressure on borrowing costs.

A second for sustainability is whether there is significant rollover risk. We find that these same institutional factors, together with the currency composition and maturity of the debt, also limit rollover risk. In this respect our conclusions differ from those of Blanchard, Felman and Subramanian (2021).

Counterbalancing these happy conclusions is the unhappy fact that India is unlikely to significantly reduce its debt ratio in the absence of extensive and politically-fraught reforms. Smaller primary budget deficits will be difficult to achieve given pressure for social and infrastructure spending, including on climate-change abatement and adaptation and the green transition, and the difficulty of boosting tax revenues. Faster growth rates or lower interest rates are pleasant to imagine but difficult to achieve.

What are the costs of living with high public debt? First, interest payments will continue to absorb a significant share of the government’s resources, limiting their availability for other economic and social priorities. Second, available fiscal resources leave no room for meeting emerging priorities, including health, education, and climate change adaptation. Third, the level of indebtedness limits scope for responding to negative shocks, such as declining rates of domestic or global growth. Fourth, having banks hold large amounts of government debt leaves them with fewer resources for lending to small
and medium-size enterprises (SMEs) and for otherwise relaxing financial constraints on economic growth. Fifth, feeding public debt to the banks creates the potential for financial stability risks; this is the “diabolic loop” seen a decade ago in Europe and more recently in the case of the Silicon Valley Bank. Sixth, and relatedly, with further financial liberalization and reform, the government comes to rely less on captive domestic institutions and more on foreign institutional investors. Rollover risk may be limited now, but it may rise in the future with this change in investor composition.

Section 2 summarizes trends in India’s public finances, while Section 3 describes salient features of debt composition. Section 4 presents a debt sustainability analysis, first for the General Government and then separately for the Centre and the States. The situation of the States turns out to be important. While the debt ratio of the Central Government remains stable under our baseline scenario, those of the States show a tendency to rise. There is very considerable heterogeneity in the fiscal position of different States, with certain problem cases contributing disproportionately to the level and rise in the aggregate State debt-to-GDP ratio. Strikingly, there is no evidence that more heavily indebted States with more troubled fiscal prospects face higher borrowing costs. They feel no market discipline to rein in their excesses, in other words. We discuss the policies and institutional factors responsible for this anomaly.

Section 5 turns next to past episodes of debt consolidation, and asks why major episodes of consolidation have not been sustained. In Section 6, we assess the implications and risks of the current levels of debt. Section 7 concludes.

2. Debt and Deficits in India

Public debt has been high in India and has increased markedly over the past four decades (Figure 1). Having averaged 60 percent of GDP in the 1980s, it rose to 70 percent in the 1990s and 80 percent in the 2000s. From these highs, it declined to 69 percent of GDP the following decade, before increasing to nearly 90 percent of GDP in 2020-21 in the wake of COVID and hovering at 85-87 percent for the last two years.

The budget deficit has fluctuated at around 7-8 percent of GDP, as shown in Figure 1. It rose to an unprecedented 13.1 percent of GDP in 2020-21. This increase was due mainly to higher expenditure, and to a lesser extent due to slower revenue growth and contraction of nominal GDP. This unprecedented deficit resulted in a commensurately large increase in public debt to nearly 90 percent of GDP, surpassing the previous peak of about 83 percent in the early 2000s.

Interest payments have averaged 5 percent of GDP for three decades. They rose from 11.5 percent of total revenue in 1980-81 to fully a quarter of total revenue in 2022-23. Government spends more on interest than on education
Figure 1. General Government (Federal and States) Debt and Fiscal Indicators

A. Total Public Debt*
Percent of GDP

B. Fiscal Deficit
Percent of GDP

C. Primary Deficit
Percent of GDP

D. Interest Payments
Percent of GDP

Source: CEIC (Compiled from Reserve Bank of India). Dashed horizontal lines are decadal averages from 1980-81 to 1989-90, 1990-91 to 1999-2000, 2000-01 to 2009-10, and 2010-11 to 2019-20, respectively.

Note: * Total Public Debt in India includes debt issued and other liabilities in Public Account consisting of the National Small Saving Fund (NSSF), Provident Fund, Deposit and Reserve funds, securities issued to finance subsidies on oil, food, and fertilizers, etc.
and health combined. Interest payments exceed total capital expenditure. The General Government’s primary deficit (deficit net of the aforementioned interest payments) averaged a bit over 2 percent of GDP in the two decades preceding COVID. The General Government has, in fact, run a primary surplus only once in the past 40 years, in 2007-08. Since then, there have been two sharp increases in the primary deficit, to 4.6 percent of GDP in 2009-10 and 7.8 percent of GDP in 2020-21.

Revenues have increased only slowly compared to the increase in other large emerging markets (Figure 2). Between 1980-81 and 2022-23, tax revenue rose by 3.3 percentage points of GDP, reflecting tax buoyancy (elasticity of revenues with respect to income) only slightly above 1. Non-tax revenue, which includes interest and dividends, has similarly remained stagnant as a proportion to GDP. The elasticity of revenues with respect to income is higher in other large middle-income economies, with the sole exception of Indonesia. In comparison, the expenditure-to-GDP ratio has been close to the median of other emerging countries. This gap has resulted in a perennially large, and even increasing, budget deficit compared to other emerging markets.

Expenditure overall as a share of GDP has remained broadly stable for two decades, the only large increase occurring during COVID. Nearly 85 percent has been revenue or committed expenditures. Capital spending has been low, rising modestly from 2.3 percent of GDP in 1994-95 to 3.6 percent of GDP by 2011-12, and hovering close to that level over the period 2020-21. It then rose by 1.4 percentage points to 5.0 percent of GDP in the past two years, reflecting the government’s infrastructure push.

Interest payments are high by global and emerging market standards (Figure 3). The IMF (2023) projects a further rise in the interest-payments-to-GDP ratio over the 2023-27 period as global rates trend upward.

While India’s debt ratio is comparable to or lower than in the advanced economies, this is scant comfort. Advanced-country governments enjoy lower interest rates and consequently have lower interest-payment-to-GDP ratios. Debt-to-GDP ratios of advanced economies averaged 112 percent in 2022, whereas interest payments averaged 1.5 percent of GDP. In contrast, India pays as much as 5 percent of GDP in interest on debt.

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2. Subsequently, the primary deficit declined to 3.7 percent in 2022-23.
3. Whereas direct tax collection has increased in proportion to GDP, indirect taxes as a proportion of GDP have declined, indicating a tax buoyancy of more than one for direct taxes, and less than one for indirect taxes (Appendix A).
4. Revenue expenditures are expenditures incurred for purposes other than the creation of physical or financial assets. They are incurred for the normal functioning of the government departments, interest payments, and grants to State governments and other parties.
Figure 2. General Government (Federal and States) Revenue and Expenditure

A. Total Revenue
Percent of GDP

B. Tax Revenue and Non-Tax Revenue
Percent of GDP

C. Total Expenditure
Percent of GDP

D. Revenue and Capital Expenditure
Percent of GDP

Source: CEIC (Compiled from Reserve Bank of India). Dashed horizontal lines are decadal averages from 1980-81 to 1989-90, 1990-91 to 1999-2000, 2000-01 to 2009-10, and 2010-11 to 2019-20, respectively.
FIGURE 3. Comparing India's Fiscal Indicators with Other Country Averages (General Government)

A. General Government Debt, Global

B. General Government Debt, Emerging Markets

C. Fiscal Deficit, Global

D. Fiscal Deficit, Emerging Markets

E. Interest Payments, Global

F. Interest Payments, Emerging Markets

Source: Fiscal Monitor Database, IMF April 2023. Figures show the median and interquartile range of the respective variables and respective country or country groups.
FIGURE 4. Comparing India’s Fiscal Indicators with Emerging Market (EM) Averages, General Government

A. Total Revenue to GDP (EM Median, Interquartile Range and India)

B. Total Expenditure to GDP (EM Median, Interquartile Range and India)

C. Total Revenue to GDP as of 2022 (select EMs)

D. Increase in Total Revenue to GDP between 2000 and 2022

E. Total Expenditure to GDP as of 2022 (select EMs)

F. Increase in Total Expenditure to GDP between 2000 and 2022

Source: Fiscal Monitor, IMF April 2023. Figures 4A and 4B show median and interquartile range of Emerging Market and Middle-Income Economies (83 countries) and India. Data for India is for fiscal years.
Figure 4 shows that the revenue-to-GDP ratio is below that of most other emerging markets (see also Rao 2018). Not only is the level below that in other countries, but India has one of the slowest rates of increase over the last 20 years. In contrast, the public-expenditure-to-GDP ratio is not atypical and, if anything, has increased more slowly. India’s deficit is evidently more a problem of low revenues than one of high expenditure.5

3. Debt Composition

Next, we consider the duration, currency composition and ownership of the debt. The upshot of this analysis is that India faces limited rollover or run risk, although this could rise in the future.6

F I G U R E  5 .  Duration of Debt (General Government)

Source: Data for short-term debt for 2000-01 to 2009-10 are from Status Paper, Ministry of Finance, September 2016; and then from Status Paper on Government Debt, Ministry of Finance, April 2022. Long-term debt is calculated as total minus short-term debt.

5. We return to this point in Section 5.

6. As noted in the introduction, this conclusion that rollover risk is limited runs contrary to certain other recent studies. Consistent with our view, the RBI in its biannual Financial Stability Reports does not flag the holding of government securities, or changes in the interest rate, as significant risks to Indian banks.
FIGURE 6. Weighted Average Maturity of Outstanding Debt

A. Weighted Average Maturity of Centre and State Government Securities

B. Weighted Average Maturity of General Government Securities


Note: We use the shares of the Centre and States in total debt as weights to calculate weighted average maturity on the General Government outstanding stock, for Q3 2022-23, the shares are assumed to be the same as those for 2021-22. For Q3 2022-23, the weighted average maturity is the average of the weighted average maturities for the period Q1-Q3 2022-23.
Nearly 90 percent of General Government debt is long-term, as measured by residual maturity (Figure 5).\(^7\) There has been a concerted effort to reduce rollover risk by issuing long-tenor securities. As a result, the weighted average maturity periods for both Central and State government loans have been increasing (Figure 6).

Tenors vary. The share of Central Government debt with a maturity greater than 20 years rose from 13 to 20 percent between 2012 and 2021. In the two most recent years, a majority of debt issued by the Central Government has had a maturity of 14 years or longer, and 30 percent has had a 30- or 40-year maturity.

State debt has a lower average maturity. As of March 2022, about 5 percent of the outstanding State Development Loans (SDLs) had a maturity of less than a year. Maturity periods for 30 percent of SDLs were 1-5 years, for 45 percent, 5-10 years. The remaining 20 percent had a maturity of 10 years or longer (of which a small proportion had a maturity of more than 20 years).\(^8\) The market for long-term debt is thin, and the term premium for all but the highest quality borrowers (insurance companies and the like) can be significant. The States seek to minimize interest costs; they, therefore, issue shorter-term debt while waiting for the market in longer-term debt to develop.

While the average maturity of public debt has risen, yields have declined, albeit slightly. The General Government weighted average coupon fell from 8 percent in 2011-12 to 7.3 percent in 2022-23 (Figure 7). The average yield on Central Government debt has been slightly lower than that on State debt.

Strikingly, bond yields in India have not moved with the level of indebtedness or even with inflation. This is true at both the Central and State Government levels. In particular, the interest rate at which different States raise their debts does not vary significantly with the level of indebtedness, primary deficit, or the rate of economic growth.\(^9\) Rangarajan and Prasad (2013) suggest that this reflects an implicit guarantee from the Central Government, while Mishra and Patel (2022) point to the fact that the largest investors in government bonds (public sector banks, insurance companies and provident funds) are owned by the Central Government, and as such are not profit-maximizing entities. These institutional investors are all required to hold government bonds as a statutory requirement (see Appendix D).

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7. Short-term debt of the Centre includes 14-day intermediary treasury bills, 91-day, 182-day, and 364-day treasury bills, dated securities maturing in the ensuing year, and external debt with residual maturity of less than one year. For the States, short-term debt includes market loans maturing within the next year, loans to the Centre due in the ensuing year, and short-term borrowings from the RBI through Ways and Means Advances (WMA).

8. According to the RBI’s Report on State Finances (January 2023), “Though 63.3 per cent of the outstanding State government securities is in the residual maturity bucket of five years and above, redemption pressure is expected to remain high till 2030-31.”

9. The calculations are based on the average nominal weighted average yield on new issues.
In addition, the Reserve Bank of India (RBI), by carefully scheduling the calendar of borrowing and coaxing government-owned investors to hold the bonds of the States, ensures that interest rates on State debt remain in a tight range. Evidently, it does not want perceptions of debt distress or unsustainability of the debts of some States to infect others. We are not convinced of the advisability of this policy; we will have more to say about it below.

**FIGURE 7. Cost of Debt (Outstanding Debt)**


Note: The shares of the Centre and States in total debt are used as weights to calculate the weighted average coupon on General Government outstanding stock.
The average yield on new issuances has also declined over time, from about 11 percent in 2000-01 to about 7.5 percent currently (Figure 8).

**Figure 8. Cost of Debt (New Issues in the Year)**

A. Yield on Dated Securities

B. Weighted Average Yield General Government

Source: For the Centre and State WAY, RBI (till 2020-21). For the Centre, Public Debt Management Quarterly Report (March 2023) for 2021-22 and Q3 2022-23; and for the State: State Finances Report (2023), RBI, for 2021-22 and 2022-23. Yield is for primary issues in the year indicated.

Note: Shares of the Centre and States in total debt are used as weights to calculate the Weighted Average Yield (WAY) on General Government primary issues (new issues in the year).
As Figure 9 shows, less than 4 percent of General Government debt in 2020-21 is offered at floating rates. (Only the Central Government offers floating debt.) Thus, the country’s debt portfolio is largely insulated from short-run interest rate volatility.

**Figure 9. Fixed and Floating Rate Debt**

![Graph showing fixed and floating rate debt over time]

Source: Data for years 2000-01 to 2009-10 is from the Status Paper (September 2016); data for 2010-11 to 2020-21 are from the Status Paper (April 2022), Ministry of Finance.

Figure 10 shows the breakdown of General Government debt securities by owner. In 2015-16, about 42 percent of General Government debt was owned by commercial banks. The bank share then dropped to 37 percent in 2021-22, as various regulatory requirements mandating their holding government bonds were relaxed (see below, including Appendix D). The share held by foreign portfolio investors is very low; these investors owned about 3 percent of public debt securities in 2015-16, after which their share similarly dropped to 1 percent in 2021-22. Correspondingly, the shares of insurance companies, provident funds, and the RBI increased over time.

In 2000-01, about 13.5 percent of Central Government debt was issued externally. Since then there has been a steady decline in the share of external debt, which stood at just 3.7 percent in 2021-22 (Figure 11). The remainder is long-term instruments, concessional, and owed to multilateral and bilateral

---

10. A floating rate bond is based on a benchmark rate, such as the repo rate, reverse repo rate, treasury bill yield, or saving schemes interest rates, plus a fixed spread that is determined at the time of first issuance.
investors (amounting to 3 percent of the total debt). Holdings of foreign institutional investors are just 1 percent of the total debt. Foreign banks hold negligible quantities of Indian government debt.

**Figure 10. Ownership of Debt**

![Diagram illustrating the Ownership Pattern of General Government Dated Securities between 2015-16 and 2021-22.]

Source: Public Debt Statistics, RBI.

Note: Provident funds are retirement funds run by the government. Others include Co-operative Banks, Non-Bank PDs, Mutual Funds, Corporates, Financial Institutions, and Others.

As is to be expected, most of this externally-held debt is denominated in foreign currency. Debt denominated in foreign currency dropped from about 10 percent of the total in 2002-03 to 4.3 percent in 2020-21 (Figure 11). Consequently, the debt portfolio is largely insulated from currency risk.

### 4. Debt Sustainability

We now use extrapolations of the debt-to-GDP ratio as a way of thinking about debt sustainability. We use Equation 1 to project the trajectory of public debt.\(^{12}\)

11. In 2003-04, IDA was the largest source of multilateral external debt. Since then, its share has dropped by half (from 54 percent of the external debt to 26 percent in 2021), with a corresponding increase in debt from IBRD and ADB, which contributed to 16 percent and 19 percent of the external debt, respectively, as of 2020-21. Among the bilateral sources, Japan has consistently been the largest contributor, accounting for 24 percent of the external debt in 2020-21, followed by Germany and Russia.

12. The exercise is based on the assumption that \(g, r, \) and \(pd\) are exogenous, that is, they are not impacted by the level of debt.
**FIGURE 11.** External Debt (% of Total Debt), General Government

**A. External Debt (% of Total Debt)**

<table>
<thead>
<tr>
<th>Year</th>
<th>Debt (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002-03</td>
<td>10.9</td>
</tr>
<tr>
<td>2003-04</td>
<td>8.5</td>
</tr>
<tr>
<td>2004-05</td>
<td>7.5</td>
</tr>
<tr>
<td>2005-06</td>
<td>7.8</td>
</tr>
<tr>
<td>2006-07</td>
<td>6.5</td>
</tr>
<tr>
<td>2007-08</td>
<td>5.8</td>
</tr>
<tr>
<td>2008-09</td>
<td>5.1</td>
</tr>
<tr>
<td>2009-10</td>
<td>4.5</td>
</tr>
<tr>
<td>2010-11</td>
<td>4.2</td>
</tr>
<tr>
<td>2011-12</td>
<td>4.3</td>
</tr>
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<td>2012-13</td>
<td></td>
</tr>
<tr>
<td>2013-14</td>
<td></td>
</tr>
<tr>
<td>2014-15</td>
<td></td>
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<tr>
<td>2015-16</td>
<td></td>
</tr>
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<td>2016-17</td>
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<td>2017-18</td>
<td></td>
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<td>2018-19</td>
<td></td>
</tr>
<tr>
<td>2019-20</td>
<td></td>
</tr>
<tr>
<td>2020-21</td>
<td></td>
</tr>
</tbody>
</table>

**B. Foreign Currency Denominated Debt (% of Total Debt)**

<table>
<thead>
<tr>
<th>Year</th>
<th>Debt (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002-03</td>
<td>10.9</td>
</tr>
<tr>
<td>2003-04</td>
<td>8.4</td>
</tr>
<tr>
<td>2004-05</td>
<td>7.5</td>
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<td>2005-06</td>
<td>7.8</td>
</tr>
<tr>
<td>2006-07</td>
<td>6.5</td>
</tr>
<tr>
<td>2007-08</td>
<td>5.8</td>
</tr>
<tr>
<td>2008-09</td>
<td>5.1</td>
</tr>
<tr>
<td>2009-10</td>
<td>4.5</td>
</tr>
<tr>
<td>2010-11</td>
<td>4.2</td>
</tr>
<tr>
<td>2011-12</td>
<td>4.3</td>
</tr>
<tr>
<td>2012-13</td>
<td></td>
</tr>
<tr>
<td>2013-14</td>
<td></td>
</tr>
<tr>
<td>2014-15</td>
<td></td>
</tr>
<tr>
<td>2015-16</td>
<td></td>
</tr>
<tr>
<td>2016-17</td>
<td></td>
</tr>
<tr>
<td>2017-18</td>
<td></td>
</tr>
<tr>
<td>2018-19</td>
<td></td>
</tr>
<tr>
<td>2019-20</td>
<td></td>
</tr>
<tr>
<td>2020-21</td>
<td></td>
</tr>
</tbody>
</table>


Note: External debt is debt to foreign lenders: banks, non-bank financial institutions, international organizations and foreign governments, among others.

\[ \Delta b_t = \frac{b_{t-1}(r_t - g_t)}{1 + g_t} + pd_t \]  

Here \( b_t \) is the debt-to-GDP ratio, \( pd_t \) is the primary-deficit-to-GDP ratio (deficit net of interest payment), \( g_t \) is growth of real GDP, and \( r_t \) is the real...
interest rate on public debt; all in year t. $\Delta b_t$ is the change in debt-to-GDP ratio between t and t-1.

4.1. General Government

We consider a baseline scenario and several additional scenarios. As the baseline, real GDP growth, the real interest rate, and the primary deficit will be at the same levels for the next five years as their respective averages from 2013-14 to 2022-23 (Table 2) – that is, 5.7 percent, 2.8 percent and 2.9 percent, respectively.\textsuperscript{13} This yields an annual increment to the debt-to-GDP ratio of 0.5 percentage points a year, implying a cumulative increment of 2.2 percentage points over five years. General Government debt is projected to reach 88.7 percent of GDP in 2027-28 (Table 2).

The second scenario assumes faster GDP growth. Our third scenario then adds a favorable change of half a standard deviation in the primary deficit from the average level over the past decade for each variable (Table 3). Thus, we assume GDP growth of 7.9 percent a year, or a primary deficit of 1.9 percent, respectively.

In this second scenario, the debt-to-GDP ratio declines by 1.2 percentage points a year, reaching 81.0 percent in 2027-28. In the third scenario, it declines by 0.5 percentage points a year, reaching 83.9 percent in 2027-28.\textsuperscript{14} Thus, even under optimistic assumptions, the debt-to-GDP ratio will remain high relative to comparator countries.

The debt ratio will also remain high relative to India’s Fiscal Responsibility and Budget Management (FRBM) targets, which foresee a debt-to-GDP ratio of no more than 60 percent.\textsuperscript{15} But adherence to these targets is not mandatory. There is no formal mechanism to monitor compliance, and there are no penalties for breaching the targets. It follows that governments have not been able to adhere to these limits on deficits and debts.

\textsuperscript{13} For comparison, in 2022-23 growth was 7.0 percent, the real interest rate was -1.0 percent, and the primary deficit was 3.7 percent.

\textsuperscript{14} We obtain similar pathways for public debt under most other reasonable scenarios.

\textsuperscript{15} The Sarma Committee on Fiscal Responsibility Legislation was set up in 2000 to recommend fiscal reforms. After several rounds of reviews and modifications, its deliberations led to the formulation of the Fiscal Responsibility and Budget Management Act. In 2016, a committee under N.K. Singh was then tasked with suggesting changes in the Act. It suggested using General Government debt as the primary target for fiscal policy, with a General Government debt-GDP target of 60 percent to be achieved by 2023 (40 percent for the Centre and percent for the States). Accordingly, the Finance Act of 2018 included the following amendments to the FRBM Act. First, the fiscal deficit should be reduced to 3 percent of GDP by 2020-21. Second, the revenue deficit (the difference between recurrent expenditure and recurrent earnings) and effective revenue deficit (revenue deficit minus any grants that the States received from the Centre for capital expenditure) were no longer targeted. Third, General Government debt again was not to exceed 60 percent of GDP, while Central Government debt was not to exceed 40 percent of GDP, but now by the end of 2024-2025.
### Table 1. Average Values and Standard Deviations of the Key Parameters for General Government

<table>
<thead>
<tr>
<th></th>
<th>Ten-year Average (2013-14 to 2022-23)</th>
<th>Five-year Average (2018-19 to 2022-23)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>Std dev</td>
</tr>
<tr>
<td>Nominal GDP growth ($\gamma$)</td>
<td>10.7</td>
<td>4.3</td>
</tr>
<tr>
<td>Deflator growth ($\pi$)</td>
<td>4.7</td>
<td>2.3</td>
</tr>
<tr>
<td>Real GDP growth (g)</td>
<td>5.7</td>
<td>5.3</td>
</tr>
<tr>
<td>Nominal interest rate (i)</td>
<td>7.5</td>
<td>0.8</td>
</tr>
<tr>
<td>Real interest rate (r)</td>
<td>2.8</td>
<td>2.6</td>
</tr>
<tr>
<td>Primary deficit (pd)</td>
<td>2.9</td>
<td>2.1</td>
</tr>
<tr>
<td>Growth-interest differential (g-r)</td>
<td>3.0</td>
<td>4.8</td>
</tr>
</tbody>
</table>

Source: CEIC (Compiled from Reserve Bank of India).
Note: Real interest rate has been calculated as nominal interest rate minus deflator growth.

### Table 2. Evolution of General Government Debt-to-GDP Ratio

<table>
<thead>
<tr>
<th>Scenarios</th>
<th>Scenario Description</th>
<th>Debt Level in 2022-23 ($b_t$)</th>
<th>Primary Deficit (pd)</th>
<th>Real GDP Growth (g)</th>
<th>Real Interest Rate (r)</th>
<th>Change in Debt in First Year ($\Delta b_t$)</th>
<th>Cumulative Change in Debt in Next Five Years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline (S1)</td>
<td>Baseline: Past 10-year averages</td>
<td>86.5</td>
<td>2.9</td>
<td>5.7</td>
<td>2.8</td>
<td>0.5</td>
<td>2.2</td>
</tr>
<tr>
<td>S2</td>
<td>Higher real GDP growth rate</td>
<td>86.5</td>
<td>2.9</td>
<td>7.9</td>
<td>2.8</td>
<td>-1.2</td>
<td>-5.5</td>
</tr>
<tr>
<td>S3</td>
<td>Lower primary deficit</td>
<td>86.5</td>
<td>1.9</td>
<td>5.7</td>
<td>2.8</td>
<td>-0.5</td>
<td>-2.6</td>
</tr>
<tr>
<td>S4</td>
<td>S1 plus contingent liabilities absorbed (1 percentage point of GDP) each year</td>
<td>86.5</td>
<td>2.9</td>
<td>5.7</td>
<td>2.8</td>
<td>1.5</td>
<td>6.9</td>
</tr>
<tr>
<td>S5</td>
<td>S1 with higher real GDP growth rate and Lower Primary Deficit</td>
<td>86.5</td>
<td>1.9</td>
<td>7.9</td>
<td>2.8</td>
<td>-2.2</td>
<td>-10.1</td>
</tr>
</tbody>
</table>

Source: CEIC, CAG, and authors’ calculations.
Note: Projections start from 2023-24. For 2022-23, estimates of the level of debt are from the Economic Survey.
The RBI, in its reports on State finances, and the IMF, in its Article IV Reports, warn of the impact of contingent liabilities on debt sustainability. The RBI (2023) observes that “State government guarantees increased sharply by end-March 2021, which has implications for their debt sustainability.” The IMF (2022a) reports that “[f]iscal risks reflect higher macroeconomic uncertainty, particularly from the external sector, and contingent liabilities from public sector banks and electricity generation corporations.” Past contingent liabilities have been on account of Air India, public sector banks, electricity distribution companies, public-private partnerships (PPPs) in infrastructure provision, and other State-owned Enterprises (SOEs). They materialize when governments assume the debts of companies, rescuing and recapitalizing them. Blanchard et al. (2021) apply Equation 1 to historical data for India and take the difference between actual and implied changes as the realization of contingent liabilities. They find these to have been substantial. Alternatively, the Office of the Comptroller and Auditor General and RBI have attempted to estimate contingent liabilities directly; as of March 2021, they put these at 2.5 percent of GDP for the Central Government and 3.7 percent of GDP for the States (Figure 15).

We assume that contingent liabilities will be taken onto the budget at a rate of one percentage point of GDP each year for the next five years. Unsurprisingly,

16. Of these, liabilities associated with States’ loss-making electricity generation and distribution companies are undoubtedly the most important (Barnwal and Ryan 2023).
this adds another 6.9 percentage points of GDP to the debt, taking it above 93 percent of GDP under baseline assumptions.\(^\text{17}\)

The bottom line is that even under an exceptionally favorable scenario, General Government debt to GDP is unlikely to decline below 80 percent on current policies. And less benign scenarios are possible.

**FIGURE 13. Contingent Liabilities**

<table>
<thead>
<tr>
<th>A. Contingent Liabilities of the Centre</th>
<th>B. Contingent Liabilities of the States</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="graph_a.png" alt="Graph A" /></td>
<td><img src="graph_b.png" alt="Graph B" /></td>
</tr>
</tbody>
</table>

Source: Financial Audit Reports on Account of Union Government, CAG, Union Budget Statements, and RBI.

**TABLE 3. GDP-Growth-Rate-Interest-Rate Differential and Accumulation of Public Debt**

<table>
<thead>
<tr>
<th>Average g-r</th>
<th>Average Primary Deficit</th>
<th>Debt Level in 1981-82</th>
<th>Debt Level in 2019-20</th>
<th>Change in Debt-to-GDP</th>
</tr>
</thead>
<tbody>
<tr>
<td>1981-82 to 2019-20</td>
<td>1.9</td>
<td>2.9</td>
<td>48.8</td>
<td>75.7</td>
</tr>
</tbody>
</table>

Source: CEIC (Compiled from Reserve Bank of India).

**4.2. Central Government**

We use Equation 1 to project public debt for the Central Government in scenarios similar to those for General Government. In the baseline, for the next five years GDP growth, the real interest rate, and the primary deficit will be at the same levels as their respective averages from 2013-14 to 2022-23 (5.7 percent, 2.6 percent and 1.7 percent; see Table 4). This yields a stable debt-to-GDP ratio (actually, a small reduction of about 0.3 percentage points over the

\(^{17}\text{Were such liabilities instead taken onto the budget at a rate of two percentage points of GDP, this would straightforwardly add 13 percentage points of GDP to the debt, and so forth.}\)
period, as shown in Table 5). In the second scenario where we assume faster GDP growth, debt to GDP declines by a cumulative 5.6 percentage points. A similar reduction is projected in the third scenario of a lower primary deficit. The only scenario in which the debt of the Central Government is projected as rising relative to GDP is when contingent liabilities materialize.

**Table 4.** Average Values and Standard Deviations of the Key Parameters for Central Government

<table>
<thead>
<tr>
<th></th>
<th>Ten-year Average (2013-14 to 2022-23)</th>
<th>Five-year Average (2018-19 to 2022-23)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>Std dev</td>
</tr>
<tr>
<td>Nominal GDP growth ($\gamma$)</td>
<td>10.7</td>
<td>5.3</td>
</tr>
<tr>
<td>Deflator growth ($\pi$)</td>
<td>4.7</td>
<td>2.3</td>
</tr>
<tr>
<td>Real GDP growth ($g$)</td>
<td>5.7</td>
<td>4.3</td>
</tr>
<tr>
<td>Nominal interest rate ($i$)</td>
<td>7.3</td>
<td>0.9</td>
</tr>
<tr>
<td>Real interest rate ($r$)</td>
<td>2.6</td>
<td>2.6</td>
</tr>
<tr>
<td>Primary deficit ($pd$)</td>
<td>1.7</td>
<td>1.8</td>
</tr>
<tr>
<td>Growth-interest differential ($g-r$)</td>
<td>3.2</td>
<td>4.8</td>
</tr>
</tbody>
</table>

Source: CEIC (Compiled from Union Budget Documents and Ministry of Statistics and Programme Implementation).

**Table 5.** Evolution of Debt-to-GDP Ratios

<table>
<thead>
<tr>
<th>Scenarios</th>
<th>Scenario Description</th>
<th>Debt Level in 2022-23 ($b_t$)</th>
<th>Primary Deficit ($pd$)</th>
<th>Real GDP Growth ($g$)</th>
<th>Real Interest Rate ($r$)</th>
<th>Change in Debt in First Year ($\Delta b_1$)</th>
<th>Cumulative Change in Debt in Next Five Years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline (S1)</td>
<td>Baseline: Past 10-year averages</td>
<td>60.5</td>
<td>1.7</td>
<td>5.7</td>
<td>2.6</td>
<td>-0.1</td>
<td>-0.3</td>
</tr>
<tr>
<td>S2</td>
<td>Higher real GDP growth rate</td>
<td>60.5</td>
<td>1.7</td>
<td>7.9</td>
<td>2.6</td>
<td>-1.2</td>
<td>-5.6</td>
</tr>
<tr>
<td>S3</td>
<td>Lower primary deficit</td>
<td>60.5</td>
<td>0.9</td>
<td>5.7</td>
<td>2.6</td>
<td>-0.9</td>
<td>-4.4</td>
</tr>
<tr>
<td>S4</td>
<td>B1 plus contingent liabilities absorbed (0.5 percentage point of GDP) each year</td>
<td>60.5</td>
<td>1.7</td>
<td>5.7</td>
<td>2.6</td>
<td>0.4</td>
<td>2.1</td>
</tr>
<tr>
<td>S5</td>
<td>Higher real GDP growth rate and lower primary deficit</td>
<td>60.5</td>
<td>0.9</td>
<td>7.9</td>
<td>2.6</td>
<td>-2.1</td>
<td>-9.6</td>
</tr>
</tbody>
</table>

Source: CEIC (Compiled from Union Budget Documents and Ministry of Statistics and Programme Implementation), CAG, and authors’ calculations.
State Governments

For purposes of projection, we take the debt-to-GDP ratio, growth of nominal GDP, rate of inflation, and growth of real GDP as identical for the Centre and the States. However, primary deficits and interest rates differ (Table 6). In most scenarios including in the baseline, the debt-to-GDP ratio of the States is projected to increase (Table 7). By implication, the projected increase in General Government debt can be primarily (even entirely) attributed to the increase in debt-to-GDP ratio of the States.

### Table 6. Average Values and Standard Deviations of the Key Parameters for State Government

<table>
<thead>
<tr>
<th></th>
<th>Ten-year average (2013-14 to 2022-23)</th>
<th>Five-year average (2018-19 to 2022-23)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>Std dev</td>
</tr>
<tr>
<td>Nominal GDP growth (γ)</td>
<td>10.7</td>
<td>5.3</td>
</tr>
<tr>
<td>Deflator growth (π)</td>
<td>4.7</td>
<td>2.3</td>
</tr>
<tr>
<td>Real GDP growth (g)</td>
<td>5.7</td>
<td>4.3</td>
</tr>
<tr>
<td>Nominal interest rate (i)</td>
<td>7.8</td>
<td>0.8</td>
</tr>
<tr>
<td>Real interest rate (r)</td>
<td>3.1</td>
<td>2.5</td>
</tr>
<tr>
<td>Primary deficit (pd)</td>
<td>1.3</td>
<td>0.5</td>
</tr>
<tr>
<td>Growth-interest differential (g-r)</td>
<td>2.6</td>
<td>4.8</td>
</tr>
</tbody>
</table>

Source: Primary deficit data has been compiled from State Finances Report of the RBI (multiple years), GDP has been taken from CEIC (compiled from Ministry of Statistics and Programme Implementation), and interest rate has been taken from RBI’s Database on Indian Economy.
The contrast reflects higher interest rates. States pay about 0.5 percent higher interest than the Centre. As a result, \( g-r \) is less favorable. This is why the States’ debt has accumulated faster than the Centre’s despite lower primary deficits.

### Table 7. Evolution of the State Government's Debt-to-GDP Ratios

<table>
<thead>
<tr>
<th>Scenarios</th>
<th>Scenario Description</th>
<th>Debt Level in 2022-23 (( b_t ))</th>
<th>Primary Deficit (( pd ))</th>
<th>Real GDP Growth (( g ))</th>
<th>Real Interest Rate (( r ))</th>
<th>Change in Debt in First Year (( \Delta b_t ))</th>
<th>Cumulative Change in Debt in the Next Five Years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline (S1)</td>
<td>Baseline: Past 10-year averages</td>
<td>28.0</td>
<td>1.3</td>
<td>5.7</td>
<td>3.1</td>
<td>0.6</td>
<td>2.9</td>
</tr>
<tr>
<td>S2</td>
<td>Higher real GDP growth rate</td>
<td>28.0</td>
<td>1.3</td>
<td>7.9</td>
<td>3.1</td>
<td>0.1</td>
<td>0.3</td>
</tr>
<tr>
<td>S3</td>
<td>Lower primary deficit</td>
<td>28.0</td>
<td>1.0</td>
<td>5.7</td>
<td>3.1</td>
<td>0.3</td>
<td>1.6</td>
</tr>
<tr>
<td>S4</td>
<td>S1 plus contingent liabilities absorbed (0.5 percentage point of GDP) each year</td>
<td>28.0</td>
<td>1.3</td>
<td>5.7</td>
<td>3.1</td>
<td>1.3</td>
<td>6.4</td>
</tr>
<tr>
<td>S5</td>
<td>S1 with higher real GDP growth rate and lower primary deficit</td>
<td>28.0</td>
<td>1.0</td>
<td>7.9</td>
<td>3.1</td>
<td>-0.2</td>
<td>-1.0</td>
</tr>
</tbody>
</table>

Source: Primary deficit data has been compiled from State Finances Report RBI (multiple years), GDP has been taken from CEIC (compiled from Ministry of Statistics and Programme Implementation), interest rate has been taken from RBI’s Database on Indian Economy, CAG (for Contingent Liabilities), and authors’ calculations.

### Figure 15. Evolution of the State Government's Debt-to-GDP Ratio

Some States such as Gujarat and Maharashtra have managed their public finances well. Their debts have increased least since 2014-15, remaining below 25 percent of the State GDP (Table 8). At the other end of the spectrum are Punjab, Rajasthan, and Kerala, whose debts have increased, on average, by 12 percentage points of GDP since 2014-15 and exceeded 40 percent of State GDP at the end of 2020-21.

We compare some key variables across these two sets of States in Table 9. We define a dummy variable that equals 1 for States with an above-median increase in debt to GDP, and 0 for those below the median. The results show that States with large increases in debt ratios had primary deficits and contingent liabilities more than twice those of States with small increases. Although they also had slightly slower GDP growth, this differential was not significant. Inflation and interest rates did not differ across the two classes of States. There is also a notable absence of interest rate differentials, as we noted in the introduction.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Punjab</td>
<td>31.7</td>
<td>42.8</td>
<td>48.9</td>
<td>11.1</td>
<td>17.2</td>
</tr>
<tr>
<td>West Bengal</td>
<td>38.6</td>
<td>37.8</td>
<td>43</td>
<td>-0.8</td>
<td>4.4</td>
</tr>
<tr>
<td>Rajasthan</td>
<td>24.1</td>
<td>35.4</td>
<td>40.3</td>
<td>11.3</td>
<td>16.3</td>
</tr>
<tr>
<td>Kerala</td>
<td>28</td>
<td>32.9</td>
<td>40.3</td>
<td>4.9</td>
<td>12.3</td>
</tr>
<tr>
<td>Bihar</td>
<td>29</td>
<td>33.2</td>
<td>38.7</td>
<td>4.2</td>
<td>9.8</td>
</tr>
<tr>
<td>Andhra Pradesh</td>
<td>23.4</td>
<td>33.2</td>
<td>36.9</td>
<td>9.9</td>
<td>13.5</td>
</tr>
<tr>
<td>Uttar Pradesh</td>
<td>31</td>
<td>32.3</td>
<td>36.6</td>
<td>1.3</td>
<td>5.5</td>
</tr>
<tr>
<td>Jharkhand</td>
<td>20</td>
<td>30.5</td>
<td>36.3</td>
<td>10.4</td>
<td>16.3</td>
</tr>
<tr>
<td>Goa</td>
<td>29.5</td>
<td>30.2</td>
<td>35.2</td>
<td>0.7</td>
<td>5.7</td>
</tr>
<tr>
<td>Haryana</td>
<td>21.2</td>
<td>29.9</td>
<td>33.2</td>
<td>8.7</td>
<td>12</td>
</tr>
<tr>
<td>Tamil Nadu</td>
<td>17.3</td>
<td>26.5</td>
<td>31.5</td>
<td>9.2</td>
<td>14.2</td>
</tr>
</tbody>
</table>

18. In this section, we focus on the 18 largest Indian States. Erstwhile Special Category States and the Union Territories are not included.
19. Similar results are obtained if instead of comparing the States which are below and above the median, we compare the values of these variables for the top one-third of the States for the increase in debt-to-GDP ratio with the bottom one-third of the States.
20. Saggar et al. (2017) and Nath, Pawaskar and Shiraly (2019), similarly note the absence of any correlation across States between fiscal indicators, on the one hand, and interest rates, on the other.
Barry Eichengreen, Poonam Gupta and Ayesha Ahmed

### TABLE 9. Comparing States with a Large Increase in the Debt-to-GDP Ratios with Those with a Smaller Increase in the Debt-to-GDP Ratio

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Madhya Pradesh</td>
<td>22.7</td>
<td>22.8</td>
<td>30.2</td>
<td>0.1</td>
<td>7.6</td>
</tr>
<tr>
<td>Chhattisgarh</td>
<td>14.1</td>
<td>25</td>
<td>28.8</td>
<td>10.9</td>
<td>14.7</td>
</tr>
<tr>
<td>Telangana</td>
<td>14.4</td>
<td>23.7</td>
<td>28.8</td>
<td>9.4</td>
<td>14.4</td>
</tr>
<tr>
<td>Odisha</td>
<td>16.2</td>
<td>26.7</td>
<td>26.4</td>
<td>10.5</td>
<td>10.2</td>
</tr>
<tr>
<td>Karnataka</td>
<td>17.3</td>
<td>21</td>
<td>25.9</td>
<td>3.7</td>
<td>8.6</td>
</tr>
<tr>
<td>Gujarat</td>
<td>22</td>
<td>20.4</td>
<td>22.2</td>
<td>-1.6</td>
<td>0.2</td>
</tr>
<tr>
<td>Maharashtra</td>
<td>18.1</td>
<td>18.1</td>
<td>20.9</td>
<td>0</td>
<td>2.8</td>
</tr>
</tbody>
</table>

Source: State Finances Report, RBI.

Note: GDP refers to the GSDP figures of the respective States.

In Tables 10-12 and Figures 16-17, we present debt sustainability analyses for Punjab and Gujarat, States representative of those with high and low debt-to-GDP ratios. Debt is unlikely to stabilize and may even increase further in Punjab. In Gujarat, on the other hand, debt is projected to decline as a share of State GDP in all scenarios.

In sum, States in a less favorable position are likely to face graver problems of debt sustainability, owing to slower economic growth, larger contingent liabilities, and the higher interest rates faced by States overall. Given projections...
of a stable debt-to-GDP ratio for the Central Government, the behavior of these problem States constitutes the main threat to debt sustainability.

A question is why these problem States have had so much room to run. One answer is that, as we have already noted, borrowing costs do not vary across States. Despite different debt levels (and different projected primary deficits and contingent liabilities), Gujarat and Punjab issue at equivalent interest rates. This reflects the RBI’s efforts to equalize interest rates across States. De facto, this results in States in better fiscal health subsidizing those whose health is worse. It relaxes market discipline on errant States.

We have not found much scholarly literature on the question of why rates differ so little across States. Practitioners have pointed us to the following: (1) SDLs of different States are all eligible for the RBI’s repo facility subject to the same haircut; (2) banks are allowed to mark to market different States’ SDLs identically; (3) all SDLs held by banks carry zero risk weights; (4) the RBI provides States with short-term loans up to a specified percentage of its borrowing needs; (5) at the end of the day, SDLs are covered by a broader central bank and government guarantee. Verifying these hypotheses and identifying their relative importance is an important topic for future research. So too is the political economy (in particular, whether these policies have been adopted by the relevant authorities in an effort to develop a more liquid secondary market for government bonds, or for other reasons).

The horizontal devolution of taxes among States, awarded by the Finance Commission (FC) every five years, also does not provide incentives for fiscal rectitude.\textsuperscript{21} FCs are mandated to allocate more resources to States with larger revenue deficits, which is an obvious source of moral hazard. The 15\textsuperscript{th} FC included tax effort (the ratio of per capita own tax revenue to per capita State GDP in the previous three years) as one criterion in its larger devolution matrix, but this did not solve problems on the expenditure side. Some States keep significant expenses and liabilities off budget. FCs do not have data, mechanisms, or a clear mandate to estimate contingent liabilities. The 15\textsuperscript{th} FC was asked to recommend performance incentives for States in areas like the power sector and solid waste management. But FCs have not been asked to consider overall fiscal prudence or contingent liabilities (except indirectly through reforms of the power sector) when recommending allocations.

\textsuperscript{21} The Finance Commission (FC) is a constitutional body formed by the President of India every five years to recommend the devolution of revenue to the States and its horizontal distribution. The 16\textsuperscript{th} FC is slated to be announced later in 2023-24. An earlier literature (von Hagen and Eichengreen 1996) suggests that vertical fiscal imbalances (where the Centre raises taxes but States are responsible for spending programs) provide States with incentives to run larger deficits, in the expectation of consequently receiving larger transfers from the Centre. To the extent that tax reforms have located more revenue-raising capacity at the Centre, this vertical fiscal imbalance and associated deficit bias may have grown more acute.
FCs are dissolved after they report to the President. There is no parallel institution or body to monitor States’ finances and assess whether they have departed from the course projected by the FC. Thus, it would be desirable to establish a permanent Fiscal or Expenditure Council to monitor State finances, assess the quality of data and forecasts, and inform the public of the fiscal stance and debt sustainability of different States.22

**TABLE 10. Average Values and Standard Deviations of the Key Parameters for Punjab**

<table>
<thead>
<tr>
<th></th>
<th>Ten-year Average (2013-14 to 2022-23)</th>
<th>Five-year Average (2018-19 to 2022-23)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>Std dev</td>
</tr>
<tr>
<td>Nominal GDP growth (γ)</td>
<td>8.0</td>
<td>3.6</td>
</tr>
<tr>
<td>Deflator growth (π)</td>
<td>3.0</td>
<td>1.1</td>
</tr>
<tr>
<td>Real GDP growth (g)</td>
<td>4.8</td>
<td>3.0</td>
</tr>
<tr>
<td>Nominal interest rate (i)</td>
<td>7.8</td>
<td>0.7</td>
</tr>
<tr>
<td>Real interest rate (r)</td>
<td>4.8</td>
<td>0.9</td>
</tr>
<tr>
<td>Primary deficit (pd)</td>
<td>1.5</td>
<td>3.0</td>
</tr>
<tr>
<td>Growth-interest differential (g-r)</td>
<td>0.0</td>
<td>3.2</td>
</tr>
<tr>
<td>Contingent Liabilities as % of GDP</td>
<td>8.9</td>
<td>7.0</td>
</tr>
</tbody>
</table>

Source: State Finances Report RBI, Economic and Political Weekly Research Foundation Database.

**TABLE 11. Evolution of Debt-to-GDP Ratio for Punjab**

<table>
<thead>
<tr>
<th>Scenarios</th>
<th>Scenario Description</th>
<th>Debt Level in 2022-23 (bt-1)</th>
<th>Primary Deficit (pd)</th>
<th>Real GDP Growth (g)</th>
<th>Real Interest Rate (r)</th>
<th>Change in Debt in the First Year (Δ bt )</th>
<th>Cumulative Change in Debt in the Next Five Years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline (S1)</td>
<td>Baseline: Past 10-year averages</td>
<td>47.8</td>
<td>1.5</td>
<td>4.8</td>
<td>4.8</td>
<td>1.5</td>
<td>7.6</td>
</tr>
<tr>
<td>S2</td>
<td>Higher real GDP growth rate</td>
<td>47.8</td>
<td>1.5</td>
<td>6.4</td>
<td>4.8</td>
<td>0.8</td>
<td>4.1</td>
</tr>
<tr>
<td>S3</td>
<td>Lower Primary Deficit</td>
<td>47.8</td>
<td>0.04</td>
<td>4.8</td>
<td>4.8</td>
<td>0.0</td>
<td>0.2</td>
</tr>
<tr>
<td>S4</td>
<td>Contingent liabilities absorbed (1.12 percentage point of GDP) each year</td>
<td>47.8</td>
<td>1.5</td>
<td>4.8</td>
<td>4.8</td>
<td>1.5</td>
<td>13.2</td>
</tr>
<tr>
<td>S5</td>
<td>Higher real GDP growth rate and Lower Primary Deficit</td>
<td>47.8</td>
<td>0.04</td>
<td>6.4</td>
<td>4.8</td>
<td>-0.6</td>
<td>-3.1</td>
</tr>
</tbody>
</table>

Source: State Finances Report RBI, *Economic and Political Weekly* Research Foundation Database, and authors’ calculations.

**FIGURE 16.** Evolution of Debt-to-GDP Ratio for Punjab

Projections of Punjab Debt-to-GDP

Source: CEIC, EPWRF, and RBI State Finances Reports (multiple years). Projections are from 2023-24 onwards.

**TABLE 12.** Average Values and Standard Deviations of the Key Parameters for Gujarat

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Ten-year Average (2012-13 to 2021-22)</th>
<th>Five-year Average (2017-18 to 2021-22)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>Std dev</td>
</tr>
<tr>
<td>Nominal GDP growth (γ)</td>
<td>12.4</td>
<td>5.0</td>
</tr>
<tr>
<td>Deflator growth (π)</td>
<td>3.6</td>
<td>2.1</td>
</tr>
<tr>
<td>Real GDP growth (g)</td>
<td>8.5</td>
<td>3.7</td>
</tr>
<tr>
<td>Nominal interest rate (i)</td>
<td>7.9</td>
<td>0.9</td>
</tr>
<tr>
<td>Real interest rate (r)</td>
<td>4.3</td>
<td>2.3</td>
</tr>
<tr>
<td>Primary deficit (pd)</td>
<td>0.4</td>
<td>0.3</td>
</tr>
<tr>
<td>Growth-interest differential (g-r)</td>
<td>4.2</td>
<td>4.6</td>
</tr>
<tr>
<td>Contingent Liabilities as % of GDP (as of 2021-22)</td>
<td>0.4</td>
<td>0.2</td>
</tr>
</tbody>
</table>

Source: State Finances Report RBI, Economic and Political Weekly Research Foundation Database.
### Table 13. Evolution of Debt to GDP Ratio for Gujarat

<table>
<thead>
<tr>
<th>Scenarios</th>
<th>Scenario Description</th>
<th>Debt Level in 2021-22 ($h_{t-1}$)</th>
<th>Primary Deficit (pd)</th>
<th>Real GDP Growth (g)</th>
<th>Real Interest Rate (r)</th>
<th>Change in Debt in the First Year ($\Delta h_t$)</th>
<th>Cumulative Change in Debt in the Next Five Years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline  (S1)</td>
<td>Baseline: Past 10-year averages</td>
<td>19.9</td>
<td>0.4</td>
<td>8.5</td>
<td>4.3</td>
<td>-0.4</td>
<td>-1.7</td>
</tr>
<tr>
<td>S2</td>
<td>Higher real GDP growth rate</td>
<td>19.9</td>
<td>0.4</td>
<td>10.3</td>
<td>4.3</td>
<td>-0.7</td>
<td>-3.1</td>
</tr>
<tr>
<td>S3</td>
<td>Lower primary deficit</td>
<td>19.9</td>
<td>0.2</td>
<td>8.5</td>
<td>4.3</td>
<td>-0.5</td>
<td>-2.4</td>
</tr>
<tr>
<td>S4</td>
<td>Contingent liabilities absorbed (0.04 percentage point of GDP) each year</td>
<td>19.9</td>
<td>0.4</td>
<td>8.5</td>
<td>4.3</td>
<td>-0.4</td>
<td>-1.7</td>
</tr>
<tr>
<td>S5</td>
<td>Higher real GDP growth rate and lower primary deficit</td>
<td>19.9</td>
<td>0.2</td>
<td>10.3</td>
<td>4.3</td>
<td>-0.8</td>
<td>-3.8</td>
</tr>
</tbody>
</table>

Source: State Finances Report RBI, Economic and Political Weekly Research Foundation Database, and authors’ calculations.

### Figure 17. Evolution of Debt-to-GDP Ratio for Gujarat

Source: CEIC, EPWRF, and RBI State Finances Reports (multiple years). Projections are from 2022-23 onwards.
5. Past Episodes of Debt Consolidation

We focus now on past episodes of debt consolidation. We define consolidations as instances when the General Government debt ratio fell consistently for at least five consecutive years. Using data starting in 1990, this yields two consolidation episodes: 1991-92 to 1997-98; and 2004-05 to 2012-13. Debt reduction was 6.7 percent of GDP in the first episode, 16.9 percent in the second.\(^\text{23}\)

The first episode followed a balance-of-payments crisis during which India signed up for an IMF program.\(^\text{24}\) The IMF loan was conditioned on fiscal consolidation designed to reduce the Central Government’s deficit from 8.5 percent of GDP in 1990-91 to 5 percent in 1992-93 (Chopra and Collyns 1995). This decline was premised on lower recurrent and capital expenditure. Inflation accelerated (the average annual rate of GDP inflation was about 10 percent), reflecting exchange rate depreciation in 1991-92.\(^\text{25}\) Consolidation proceeded despite the fact that growth was slower than in control years, and despite the fact that tax revenues also grew more slowly.

The period 2004-05 to 2012-13, in contrast, was marked by faster growth, especially between 2004-05 and the Global Financial Crisis. Tax and administrative reforms yielded dividends in the form of higher revenues. In this second episode, unlike the first, the decline in the primary deficit was underpinned by higher tax revenue rather than by lower expenditure; capital expenditure, in particular, was protected.

Of the reduction of 17 percentage points in the debt-to-GDP ratio, nearly 10 points were accounted for by the States. These initiatives by State Governments were supported by a Debt Swap Scheme (DSS) in 2002-03/2004-05 and a Debt Consolidation and Relief Facility (DCRF) in 2005-06/2009-10. Under DSS, States could prepay expensive loans from the Central Government and instead raise cheaper loans from the market. Under DCRF, debt relief was provided to the States through debt reduction, rescheduling of debt and lower interest rates, conditional on enacting and implementing Fiscal Responsibility and Budget Management legislation. Debt relief was linked to the improvement in fiscal performance (assessed in terms of the reduction in revenue deficits). This experience is a reminder that debt consolidation at the State and Central Government levels is not independent; the Central Government can play an important role in providing incentives to the States.

\(^{23}\) This is in contrast to Eichengreen and Esteves (2022), who also required the debt ratio to fall by at least 10 percentage points in order for it to qualify as a consolidation episode.

\(^{24}\) India signed the IMF program agreement in October 1991 and exited it in June 1993.

\(^{25}\) The exchange rate was first sharply devalued from its artificially appreciated levels, and was later floated (managed float).


**Table 14. Episodes of Debt Consolidation**

<table>
<thead>
<tr>
<th>Consolidation</th>
<th>Duration (Years)</th>
<th>Initial Debt</th>
<th>Terminal Debt</th>
<th>Change in Debt-to-GDP Ratio (Δ bₜ)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1991-92 to 1997-98</td>
<td>7</td>
<td>74.2</td>
<td>67.5</td>
<td>-6.7</td>
</tr>
<tr>
<td>2004-05 to 2012-13</td>
<td>9</td>
<td>83.6</td>
<td>66.7</td>
<td>-16.9</td>
</tr>
</tbody>
</table>

Source: CEIC (Compiled from the Reserve Bank of India).

In Table 15, we regress a set of outcome indicators on dummy variables equaling 1 in years of debt consolidation, defined as above, and 0 otherwise. The results show that inflation is more than twice as high during consolidation episodes, while the primary deficit is about 1 percentage point lower. Higher inflation might be thought to make for a lower real interest rate, but in fact, the real interest rate is significantly lower than in the control-group years only in the second consolidation episode, when its low level was largely attributable to the low level of nominal rates post-Global Financial Crisis. On average, growth is not significantly different than in normal (non-consolidation) years.

**Table 15. A Comparison of Key Variables during the Consolidation Episodes and Normal Years**

<table>
<thead>
<tr>
<th>(1) Inflation</th>
<th>(2) Growth</th>
<th>(3) Real Interest Rate</th>
<th>(4) Nominal Interest Rate</th>
<th>(5) Real Growth – Real Interest Rate</th>
<th>(6) Primary Deficit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dummy = 1 for 1991-92 to 1997-98</td>
<td>4.49***</td>
<td>-0.48</td>
<td>-0.20</td>
<td>4.29***</td>
<td>-0.28</td>
</tr>
<tr>
<td></td>
<td>(4.44)</td>
<td>(0.37)</td>
<td>(0.18)</td>
<td>(6.17)</td>
<td>(0.18)</td>
</tr>
<tr>
<td>Dummy = 1 for 2004-05 to 2012-13</td>
<td>2.90***</td>
<td>1.08</td>
<td>-3.54***</td>
<td>-0.63</td>
<td>4.61***</td>
</tr>
<tr>
<td></td>
<td>(3.12)</td>
<td>(0.91)</td>
<td>(3.46)</td>
<td>(0.99)</td>
<td>(3.30)</td>
</tr>
<tr>
<td>Constant</td>
<td>4.89***</td>
<td>5.78***</td>
<td>3.54***</td>
<td>8.43***</td>
<td>2.24***</td>
</tr>
<tr>
<td></td>
<td>(8.93)</td>
<td>(8.3)</td>
<td>(5.89)</td>
<td>(22.44)</td>
<td>(2.72)</td>
</tr>
</tbody>
</table>

No. of Observations

Source: Authors’ calculations.

Table 16 compares total revenue, tax revenue, total expenditure, and capital expenditure across consolidation episodes and normal years. While the primary deficit was lower in both episodes compared with the control years, its reduction was achieved in different ways. In 1991-92/1997-98, a lower primary deficit
was attained by compressing expenditure, including capital expenditure. The consequences were not growth-friendly. In the second episode, in contrast, the decline in primary deficit was obtained mainly through higher revenue collection, including by raising tax revenue. The result was at least growth-neutral.

**TABLE 16. A Comparison of Key Variables during the Consolidation Episodes and Normal Years**

<table>
<thead>
<tr>
<th></th>
<th>(1) Total Revenue</th>
<th>(2) Tax Revenue</th>
<th>(3) Total Expenditure</th>
<th>(4) Capital Expenditure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dummy = 1 for 1991-92 to 1997-98</td>
<td>-0.75 (1.54)</td>
<td>-1.13** (2.18)</td>
<td>-1.64** (2.22)</td>
<td>-0.74** (2.01)</td>
</tr>
<tr>
<td>Dummy = 1 for 2004-05 to 2012-13</td>
<td>1.08** (2.42)</td>
<td>0.79* (1.67)</td>
<td>-0.33 (0.49)</td>
<td>0.30 (1.09)</td>
</tr>
<tr>
<td>Constant</td>
<td>18.91*** (71.98)</td>
<td>15.67*** (56.24)</td>
<td>26.95*** (67.57)</td>
<td>3.42*** (20.83)</td>
</tr>
</tbody>
</table>

Source: Authors’ calculations.

Note: Data are from 1990-1991 to 2022-2023. Capital expenditure data is available from 1994-1995 onwards. t statistics are in parentheses. *, **, *** refer to significance at 10, 5, and 1 percent levels, respectively.

In sum, consolidation is easier when debt is reduced by both the Centre and the States. Contrary to prevailing conventional wisdom (Alesina, Favero and Giavazzi 2019), it is not obvious that consolidation achieved by cutting spending has worked better than consolidation achieved by raising revenues. The Alesina et al. result is obtained from data for advanced countries, where spending is arguably too high, so that consolidation achieved by reducing spending is more likely to work. As we showed above, international comparisons suggest that tax revenues are too low in India (not that spending is too high), suggesting that consolidation achieved through raising additional revenues can work in this setting. This is a reminder of the need to tailor advice to context.

In neither case was it possible, as it turned out, to maintain the lower levels of debt achieved in the consolidation episode. In both cases, more than half the reduction was reversed subsequently. After the 7-percentage point reduction in debt-to-GDP from 1991-92 to 1997-98, debt rose from 68 percent of GDP in 1998-99 to 85 percent in 2003-04, more than fully reversing its preceding fall. Debt rose despite an acceleration in GDP growth from 5.3 percent to 5.9 percent per annum. This rise was attributable to an increase in primary deficit from 2 percent to 3.3 percent and to some decline in inflation that translated into higher real interest rates.

The reduction of debt achieved from 2004-05 to 2012-13 was partially reversed in 2013-14/2019-20, when the debt ratio rose from 67 percent to 75 percent. The period was marked by the same primary deficit ratio as in the
preceding consolidation period, a slight deceleration in growth (from 6.9 percent to 6.7 percent), and once more a fall in inflation that translated into higher real rates.

These post-consolidation experiences speak of the limited role of inflation in debt consolidation. It is tempting to think that a country whose debt is at long tenors can inflate away a significant portion. Inflation was higher during both consolidation episodes than in other periods, consistent with this presumption. Inflation worked to reduce debt, especially in the second of the two episodes, by helping to depress the real interest rate. But once the burst of inflation passed and inflation came down, this effect was reversed. Arslanalp and Eichengreen (2023) analyze annual data on inflation and debt for a panel of countries stretching to 1800. They estimate the relationship using local projections and simulate the effect of an inflation shock. Consistent with what we find here for India, they show that the impact of an inflation shock on the debt ratio is temporary. That impact effect is reversed over time as interest rates, maturities and spending adjust. In India’s case, we would expect the speed of this adjustment to accelerate, and the transitory benefits of inflation for debt reduction to grow even more transitory, with further financial liberalization and deregulation.

6. Costs and Risks

What are the costs and risks of India’s high debt and deficits? In the introduction to our paper we identified six.

First, interest payments absorb resources, limiting their availability for other economic and social purposes. Interest payments exceed 25 percent of General Government revenues. This share is roughly twice the emerging market and developing-country average. At 5 percent of GDP, they are again twice the emerging market average (Figure 3). This difference reflects not high borrowing costs but rather high levels of debt. In contrast, government expenditure as a share of GDP is in line with other emerging markets. With interest payments absorbing a larger share of revenues, less is left for other needs. As noted, the government spends more on interest than on education and health combined. Its interest payments exceed its capital expenditure.

Second, and relatedly, available fiscal resources leave no room for meeting emerging priorities, notably climate change abatement and adaptation and the green transition. McKinsey (2022) estimates that, owing to its exposed geography, India will have to invest half as much again as advanced economies as a share of GDP to maintain its economic development in the face of climate change and in order to build low-carbon infrastructure. According to its Net Zero 2050 scenario, India will have to spend 11 percent of GDP between now and 2050 on decarbonization and low-carbon growth, compared to the global
average of 7.5 percent. This reflects elevated heat exposure of urban residents in particular, as well as the need for extensive spending on low-emissions assets and enabling infrastructure. Not all of this investment must be financed by government revenues and borrowings, of course. Global investment funds, oil and gas majors, foreign utilities, Indian conglomerates, government companies, and pension funds are all taking equity stakes in Indian renewable energy projects (Jaiswal and Gadre 2022). Wind and solar power companies issue debt to finance their investments, borrowing from domestic and international banks and development finance institutions. In 2019-21, some 50 percent of their debt financing was sourced overseas, a growing share in the form of green bonds. This said, regulatory risk (changes in tariffs and rates), planning risk (mis-estimation of power generation capacity) and extreme weather risk (including from climate change) make a significant public-finance contribution unavoidable.

Third, heavy debts limit room for responding to shocks, such as declining rates of domestic and global growth. India was not strongly constrained in responding to COVID-19; it reacted with a fiscal stimulus of 20 trillion rupees, or roughly 9 percent of GDP. About a third of this was above-the-line measures (spending on social protection and health care and foregone revenues); the remaining two-thirds of below-the-line measures involved various forms of business support (IMF 2022b). The combined response, while smaller than in the advanced economies (Hudson et al. 2022), was nonetheless substantial. Mishra and Patel (2022) argue that the resulting increase in debt has put upward pressure on interest rates, although our own analysis fails to find much evidence of this to date (see Appendix C). Be this as it may, at some point responding in this way to shocks will begin to show up in interest rates, especially as regulations encouraging investments in bonds by insurance companies, provident funds and banks are relaxed. At some point, this will begin to throw debt sustainability into doubt. Conversely, maintaining debt sustainability in the face of such shocks will leave the government countercyclically constrained, amplifying cycles.

Fourth, requiring banks and other institutional investors to hold large amounts of government debt leaves them fewer resources for lending to small and medium-sized enterprises and to otherwise help to relax financial constraints on economic development. This problem would be accentuated were India’s relatively high level of household savings to decline (households’ financial savings being held to a significant extent in the form of bank deposits, thereby making it easier for the banks to fund their investments). Moreover, so long as public-sector banks are regarded as important captive investors in government

26. India’s household savings rates are about 20 percent of GDP, of which about half are physical savings in property, etc., and the rest are financial savings. Gross financial savings of households was 12 percent of GDP in 2021-22, when spending opportunities were limited by COVID; whereas net household financial savings (after deducting household financial borrowings from gross financial savings) was 7.6 percent.
bonds, those banks are less likely to be privatized, making it correspondingly less likely that their lending will be guided by commercial motives.

Fifth, and again relatedly, high government debt creates the potential for financial stability risks. For the moment, such risks remain limited. Banks are required to hold government securities in order to satisfy their Statutory Liquidity Ratios (SLRs); they are required to hold liquid assets, including government bonds, of a specified minimum percentage of deposits. Risks to their balance sheets can, therefore, develop with the repricing of these assets when interest rates rise. However, the RBI has also mandated that banks hold highly liquid assets as Investment Fluctuation Reserves (IFRs), intended as a buffer against fluctuations in their investment portfolios. As of December 2022, banks held more than the mandated level of reserves. Moreover, public sector banks are no longer more exposed to interest rate risk than private banks or foreign banks (Acharya 2020). Finally, there is the implicit guarantee enjoyed by State Government debts. All this has limited portfolio repricing risk and the associated risk of a Silicon Valley Bank-like depositor run in response to bad news about the bond portfolio.

In addition, SLR has been cut from 38 percent in the early 1990s to 18 percent in recent years (see Appendix D). As a result, banks now hold a smaller share of their assets in government securities. But this reduction in mandated bank holdings over the last three decades means, in turn, that governments have come to rely on a more diverse set of investors to hold their debts. The share of insurance companies, provident funds, and other non-bank investors in Central Government securities has increased from 20 percent in 1990-91 to 46.6 percent in 2021-22, as noted earlier. For their part, insurance companies and provident funds are required by regulation to hold roughly 50 percent of their investable funds in government securities.

But if regulations compelling the insurance companies and provident funds to hold government bonds are further relaxed, SLR is further reduced, and/or domestic savings decline, Central and State governments will be forced to place additional debt, including short-term debt, with foreign investors, in the manner of other emerging markets. If externally-held debt is denominated in foreign currency, as in other countries, this will increase the sector’s currency mismatch, creating debt-servicing and financial difficulties when exchange rates move. Even if India succeeds in placing rupee-denominated debt with foreign investors, this nevertheless raises the risk of a capital-flow reversal, an investor strike and a bond-price collapse, since the currency mismatch will now

27. Business Standard, August 16, 2022, notes some of the developments which have led to a decline in the interest rate risk for the Indian banks: https://www.business-standard.com/article/finance/banks-now-in-better-position-to-manage-rbi-s-interest-rate-risks-122081601071_1.html

28. The RBI also holds a larger fraction of public debt than in the past. The RBI’s share has increased from 7.8 percent of the Central Government debt in 2007-08 to 16.6 percent in 2021-22. The corresponding numbers are smaller for the General Government.
be on foreign balance sheets, encouraging foreign investors to flee at the first sign of trouble (Carstens and Shin 2019).

For the moment, India may be able to place most of its debt with “patient” domestic investors. But if this becomes less true going forward, run risk—and volatility—will increase.

7. Conclusion

Our central conclusion is that India’s General-Government-debt-to-GDP ratio, which is high by emerging market standards, is unlikely to decline significantly in the next five years. In the best-case scenario, it might fall from its current level of some 90 percent of GDP, which is half again as high as the emerging market average, to 80 percent of GDP, where it would be 30 percent again as high. But less rosy scenarios are also possible.

What might be achieved with more ambition? In purely mathematical terms, India could bring down its debt to 70 percent of GDP through a combination of lower primary deficits, higher inflation, and faster GDP growth. A percentage point increase each in growth and inflation and a percentage point reduction in the primary deficit would reduce public debt to 70 percent of GDP in five years. The requisite changes could be achieved through an amalgam of the following factors:

- Raising additional revenue through higher tax, non-tax, and privatization receipts. Along with better tax administration and digitalization, recent tax reforms (notably the introduction of a uniform Goods and Services Tax in 2017) have succeeded in modestly boosting revenue growth. Yet in a fast-growing economy, where nominal GDP has been growing on average at 11-12 percent, the rate of tax-revenue growth still has not exceeded that of GDP growth, in contrast to other fast-growing emerging markets. More could be done along these lines, through additional digitization and administrative streamlining, broadening the tax base, raising property tax, and adopting new taxes.  

- Continuing to re-orient spending toward capacity- and infrastructure-enhancing investment that promises to further boost GDP and revenues.

- Limiting contingent liabilities, which have been a chronic problem at the State level.

But imagining sharp changes along these lines borders on wishful thinking. Meanwhile, economic and social development will require additional spending on health and education. Government will have to contribute significantly to

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the country’s decarbonization and climate-change-adaptation investments, which are large by international standards. Eventually, interest rates will adjust upward in response to inflation, eliminating any favorable debt-consolidation effects. As a result of these factors, India will almost certainly be living with high public debt for years to come.

All this said, the country faces no immediate crisis of debt sustainability. Our baseline scenario does not point to exploding debt ratios. For the moment, rollover risk is limited. Most public debt securities are held by banks, insurance companies and other patient domestic investors. It is denominated in rupees. Little is at short maturities or floating rates.

But the preceding does not mean that the country’s relatively high public debt is without costs. Devoting a large share of financial resources to servicing debts leaves the Central Government and States with fewer resources for other investments. At some point, it will leave less room for responding to shocks. Banks and nonbank financial institutions mandated to hold government bonds are left with fewer resources for funding economic development. Even if volatility and financial-stability risk are limited now, this could change with financial liberalization and deregulation. The bottom line is that India’s high public debt leaves no room for mis-steps.

References


Carstens, Agustin and Hyun Song Shin. 2019. “Emerging Markets Aren’t Out of the Woods Yet,” Foreign Affairs, 15 March, https://www.foreignaffairs.com/world/emerging-markets-arent-out-woods-yet?gpp=vbUtsstg/sGSATl22Ax97dDpZckdNM3FZT0d0W5LS2VQUTRuNExszOHNDQVdKR1jTFN0R2h6TmVMSmnRUQWR0b044R0Q0WnNWUDUyQkppNjFn0jyVjyzA1YmFiOWQ4OTEzZThkYzQ0ZGM3YTdkNGUwOTM0YzA2YTA1NzZhNjMjA4YjIyZDk2ODMyZDFmZWM3ZTc%3D


To view the entire video of this IPF session and the General Discussion that ended the session, please scan this QR code or use the following URL
https://youtu.be/4uc2Yuh4Hb0
# Appendix A: Data Table

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Liabilities of General Government</td>
<td>CEIC. Estimate for 2022-23 has been taken from Chapter 3 of the Economic Survey 2022-23. We have used the words debt and liabilities interchangeably in the paper.</td>
</tr>
<tr>
<td>General Government Primary Deficit</td>
<td>Calculated as the difference between Fiscal Deficit and Interest Payments</td>
</tr>
<tr>
<td>General Government Interest Payments, Total Revenue, Tax Revenue, Non-Tax Revenue, Total Expenditure, Revenue Expenditure, Fiscal Deficit</td>
<td>CEIC</td>
</tr>
<tr>
<td>Data for the Centre and the State governments</td>
<td>For key fiscal variables, we considered data from RBI (Handbook of Statistics on Indian Economy), State Finances Report, RBI, CEIC Database, Economic Survey, and India Series in the Economic and Political Weekly Research Foundation’s (EPWRF) Database. While largely data for Centre and State Government match across these sources (with EPWRF’s estimates slightly different than those provided by RBI and CEIC), the data for debt does not add up to General Government Data. We calculated Centre’s debt as the difference between General Government Outstanding Liabilities and State’s outstanding liabilities net of loans and advances from the Centre. For the other variables, we used the RBI’s Database on Indian Economy and its State Finances Report.</td>
</tr>
<tr>
<td>General Government Debt for Global and Emerging Markets</td>
<td>Fiscal Monitor, IMF April 2023</td>
</tr>
<tr>
<td>Interest Payments on General Government Debt for Global and Emerging Markets</td>
<td>Calculated as the difference between fiscal deficit and primary deficit, compiled from the Fiscal Monitor, IMF April 2023</td>
</tr>
<tr>
<td>Contingent Liabilities</td>
<td>The data for contingent liabilities is available from 2008-09 till 2021-22 for the Central Government and has been compiled from various annual financial audits of the union government conducted by the CAG. The outstanding guarantees data for states is available from 1991-92 onwards and is published by the State Finances Report. The data for Centre’s outstanding guarantees and States’ outstanding guarantees are available for 2008-09 to 2021-22 to get the General Government contingent liabilities.</td>
</tr>
</tbody>
</table>
Appendix A: Tax Buoyancy

FIGURE A.1. Tax Buoyancy

Source: Authors’ calculations.
Note: Tax buoyancy is measured as the ratio of tax revenue growth relative to nominal GDP growth for each of the years shown in the chart. If gross tax receipts increase more than proportionally to an increase in nominal growth (that is, the ratio is greater than 1), then we say that the tax system is buoyant. Horizontal dashed lines are for decadal averages from 1981-82 to 1989-90, 1990-91 to 1999-2000, 2000-01 to 2009-10, and 2011-12 to 2019-20.

FIGURE A.2. Direct and Indirect Taxes

Source: RBI. Direct taxes refer to taxes levied on property or income such as income tax and personal property tax. Indirect taxes refer to. Indirect taxes are levied on goods and services such as GST and customs and excise duties. The data for 2020-21 is a Revised Estimate and for 2021-22 is a Budget Estimate. Horizontal dashed lines are for decadal averages from 1981-82 to 1989-90, 1990-91 to 1999-2000, 2000-01 to 2009-10, and 2011-12 to 2019-20.
## Appendix B: Debt and Deficit of the Centre and the States

### Figure B.1. Public Debt of the Central and State Governments

#### A. Debt of the Central Government (% of GDP)

<table>
<thead>
<tr>
<th>Year</th>
<th>Debt (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1990-1991</td>
<td>59.9</td>
</tr>
<tr>
<td>1992-1993</td>
<td>54.7</td>
</tr>
<tr>
<td>1994-1995</td>
<td>60.5</td>
</tr>
</tbody>
</table>

#### B. Debt of the State Government (% of GDP)

<table>
<thead>
<tr>
<th>Year</th>
<th>Debt (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1990-1991</td>
<td>22.0</td>
</tr>
<tr>
<td>1992-1993</td>
<td>25.4</td>
</tr>
<tr>
<td>1994-1995</td>
<td>23.8</td>
</tr>
</tbody>
</table>

Source: State Finances Report, RBI (States). For 2021-22: Revised Estimates and for 2022-23 the Budget Estimates for State’s Total Debt. The charts show the total outstanding liabilities of Central Government and State Government as % of GDP. States total liabilities include the debt it owes to the Centre. The Centre’s Total Debt has been calculated as the difference between General Government total outstanding liabilities and State Government liabilities net of loans and advances from the Centre. Horizontal dashed lines are the respective decadal averages.

### Figure B.2. Debt Owed to the Central Government by the States and Net Public Debt of the Central Government

#### A. Debt of the State Government (% of GDP)

<table>
<thead>
<tr>
<th>Year</th>
<th>States Total Debt</th>
<th>Debt owed to Centre</th>
</tr>
</thead>
<tbody>
<tr>
<td>1990-1991</td>
<td>58.5</td>
<td>35.0</td>
</tr>
<tr>
<td>1992-1993</td>
<td>28.0</td>
<td>22.0</td>
</tr>
<tr>
<td>1994-1995</td>
<td>48.4</td>
<td>48.8</td>
</tr>
<tr>
<td>1996-1997</td>
<td>44.9</td>
<td>44.9</td>
</tr>
<tr>
<td>1998-1999</td>
<td>22.0</td>
<td>29.4</td>
</tr>
<tr>
<td>2000-2001</td>
<td>23.8</td>
<td>23.8</td>
</tr>
<tr>
<td>2002-2003</td>
<td>28.0</td>
<td>28.0</td>
</tr>
</tbody>
</table>

Source: State Finances Report, RBI (States). For 2021-22, we have used the Revised Estimates and for 2022-23 the Budget Estimates for State’s Total Debt. The chart in the left panel shows the total outstanding liabilities of States as % of GDP as well as the component for loans and advances from Centre as % of GDP. The chart in the right panel shows the States’ total debt and the Central Government net debt calculated as the difference between General Government total debt and States total debt. Horizontal dashed lines are the respective decadal averages.
Figure B.3. Share of Centre (Net Debt) and States (Total Debt) in Total Public Debt

Source: State Finances Report, RBI (States). Net public debt for the Centre has been calculated as the difference between General Government total outstanding liabilities and State’s total outstanding liabilities. For 2021-22, we have used the Revised Estimates and for 2022-23, the Budget Estimates for State’s Total Debt. In this chart, we are showing the share of Centre’s debt and States’ debt in the total General Government debt (following the specification in Figure B.2).

Figure B.4. Total Debt of States and Total Debt Excluding Debt on Account of UDAY

Source: State Finances Report, RBI (States) and CEIC (compiled from Clearing Corporation of India for Ujjwal DISCOM Assurance Yojana, UDAY). For 2021-22, we have used the Revised Estimates and for 2022-23, the Budget Estimates. The chart shows the total outstanding liabilities of State Government as % of GDP, total outstanding liabilities of States excluding UDAY as % of GDP, and debt incurred on account of UDAY as % of GDP. Under the UDAY scheme, State Governments assumed contingent liabilities on account of the loss-making electricity distribution companies (governments issued bonds in lieu of the debt owed by these companies to the banks).
F I G U R E B. 5. Deficit of Centre and States

Fiscal Deficit, % of GDP

Source: Handbook of Statistics on Indian Economy, RBI (Centre) and State Finances Report, RBI (States). For the Centre, data for 2021-22 is Actual and 2022-23 is a Revised Estimate from CEIC. For States, data for 2021-22 is a Revised Estimate and for 2022-23 is a Budget Estimate. The chart shows the fiscal deficit as % of GDP for both the Centre and State governments. Horizontal dashed lines are the respective decadal averages.

F I G U R E B. 6. Primary Deficit of Centre and States

Primary Deficit, % of GDP

Source: Handbook of Statistics on Indian Economy, RBI (Centre) and State Finances Report, RBI (States). For Centre, data for 2021-22 is Actual and 2022-23 is a Revised Estimate from CEIC. For States, data for 2021-22 is a Revised Estimate and for 2022-23 is a Budget Estimate. The chart shows the primary deficit as % of GDP for both the Centre and State government. Horizontal dashed lines are the respective decadal averages.
Figure B.7. Interest Rate Paid by Centre and State Governments

Source: RBI (Centre and States), CEIC (individual State Governments). Yields refer to weighted average yields on new issues of securities during the year.
Appendix C: Debt-to-GDP Ratio and Interest Rates on Government Debt (General Government)

We regress nominal interest rates on debt-to-GDP ratio of the General Government, for the entire period 1990-91 to 2022-23, and different subperiods. Interest rates have been calculated as weighted average yields on Centre and State government securities using the shares of Centre and States’ debt in total debt as weights.

Results indicate that the interest rates do not react positively to the level of debt (Table C1). In other words, the government does not pay a premium to raise debt when its debt levels are already high. One would have expected this to be perhaps more true in the earlier years, when financial repression through high SLR and CRR, and even through the automatic monetization of deficit by the RBI was much higher. But it also remains the case for the period starting in 2010-11.

**Table C.1. Results from Regressing Nominal Interest Rate on Debt-to-GDP Ratio of the General Government**

<table>
<thead>
<tr>
<th></th>
<th>(1) Nominal Interest Rate (Yields)</th>
<th>(2) Nominal Interest Rate (Yields)</th>
<th>(3) Nominal Interest Rate (Yields)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Debt-to-GDP ratio</td>
<td>-0.18***</td>
<td>-0.08**</td>
<td>-0.08***</td>
</tr>
<tr>
<td></td>
<td>(3.23)</td>
<td>(2.77)</td>
<td>(4.71)</td>
</tr>
<tr>
<td>Constant</td>
<td>22.42***</td>
<td>13.65***</td>
<td>13.72***</td>
</tr>
<tr>
<td></td>
<td>(5.44)</td>
<td>(6.37)</td>
<td>(10.62)</td>
</tr>
<tr>
<td>No. of Observations</td>
<td>33</td>
<td>23</td>
<td>13</td>
</tr>
<tr>
<td>Years included</td>
<td>1990-91 to 2022-23</td>
<td>2000-01 to 2022-23</td>
<td>2010-11 to 2022-23</td>
</tr>
</tbody>
</table>

Source: Authors’ calculations. Nominal interest rate for General Government has been calculated as the weighted average yield on Centre and State Government securities (using the shares of Centre and States’ debt in total debt as weights).

Note: t statistics in parentheses. *, **, *** refer to significance at 10, 5, and 1 percent levels, respectively. Nominal interest rate for general government has been calculated as the weighted average yield on Centre and State government securities (using the shares of Centre and States’ debt in total debt as weights).

As we show in the next appendix, over time the financial repression (at least through commercial banks) has declined, and the investor base has become more diversified. Yet the non-relationship (or the reverse relationship) between interest rates and debt levels has persisted. This could be attributed to three factors: (i) There are adequate savings and lack of alternative safe assets. (ii) Financial repression has continued but has just shifted from commercial banks to other investors, notably insurance companies and provident funds. (iii) The RBI, with a strong balance sheet (along with other large players in the market, such as the State Bank of India), ensures that yields remain low.

We repeat the exercise with real interest rates, and find that the real interest rates do not react positively to the level of debt (Table C2).

---

30. Lack of positive relationship prevails when we do a similar exercise separately for Central and State governments.
**Figure C.1. Co-movement of Debt-to-GDP Ratio and Nominal Interest Rate**

Debt-to-GDP Ratio and Nominal Interest Rate
(Scatter Plot)

Debt-to-GDP Ratio and Nominal Interest Rate
(Time Series)

Source: CEIC (General Government debt-to-GDP ratio). Nominal interest rate for General Government has been calculated as the weighted average yield on Centre and State Government securities (using the shares of Centre and States debt in total debt as weights).
<table>
<thead>
<tr>
<th></th>
<th>(1) Real interest rate</th>
<th>(2) Real interest rate</th>
<th>(3) Real interest rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Debt-to-GDP ratio</td>
<td>-0.11</td>
<td>-0.06</td>
<td>-0.12</td>
</tr>
<tr>
<td></td>
<td>(1.52)</td>
<td>(0.72)</td>
<td>(1.32)</td>
</tr>
<tr>
<td>Constant</td>
<td>10.80*</td>
<td>6.31</td>
<td>10.96</td>
</tr>
<tr>
<td></td>
<td>(1.98)</td>
<td>(1.05)</td>
<td>(1.60)</td>
</tr>
<tr>
<td>No. of Observations</td>
<td>33</td>
<td>23</td>
<td>13</td>
</tr>
<tr>
<td>Years included</td>
<td>1990-91 to 2022-23</td>
<td>2000-01 to 2022-23</td>
<td>2010-11 to 2022-23</td>
</tr>
</tbody>
</table>

Source: Nominal interest rate for General Government has been calculated as the weighted average yield on Centre and State Government securities (using the shares of Centre and States debt in total debt as weights). Rate of growth of deflator (inflation rate) was then subtracted from nominal interest rate to get the real interest rate.

Note: Data are from 1990-1991 to 2022-2023. t statistics in parentheses. *, ** , *** refer to significance at 10, 5, and 1 percent levels, respectively. Real interest rate has been calculated as the difference between nominal interest rate and growth rate of GDP deflator (inflation rate).
FIGURE C.2. Co-movement of Debt-to-GDP Ratio and Real Interest Rate

Debt-to-GDP Ratio and Real Interest Rate (Scatter Plot)

Debt-to-GDP Ratio and Real Interest Rate (Time Series)

Source: CEIC (General Government debt to GDP ratio). Nominal interest rate for General Government has been calculated as the weighted average yield on Centre and State Government securities (using the shares of Centre and States debt in total debt as weights).
Appendix D: Bank-Sovereign Nexus

The following five kinds of investors hold government securities: banks, insurance companies, provident funds, the RBI, and a residual category, which includes retail investors, cooperative banks, and mutual funds, among others. Their relative shares have changed in the last decade, over which the share of banks has declined, whereas those of the other four investors have increased (Figure D2).

The government owns a large part of each segment. For instance, it owns 12 banks (21 banks are private) and 7 of the largest insurance companies (50 insurance companies are private). Government banks accounted for 60 percent of total bank assets, while government insurance companies accounted for about 80 percent of the industry’s total assets (as of 2020-21).

Banks, insurance companies, and provident funds have statutory requirements to invest in government securities (for the banks, for example, see Figure D1). But public banks have traditionally held more than the mandated share of their assets in government securities (Gupta, Kochhar, and Panth 2011). Their SLR ratio has declined from about 40 percent in the early 1990s to 18 percent currently, while public sector banks have reduced their excessive shares in these securities. They now hold only a slightly larger share of their assets in government securities compared to private banks.

Both insurance companies and provident funds face statutory requirements to invest about 50 percent of their respective investable funds in government securities. In recent years, the provident fund has requested the government to allow it to increase the share of its investments in government securities, from 50 percent to 65 percent in 2016, and again to 75 percent in 2022. This request indicates a lack of options as far as other safe, long-term, and liquid assets are concerned (the corporate bond market is thin, and its secondary market has very little volume and liquidity).

Figure D.1. Statutory Liquidity Ratio

Source: CEIC (Compiled from Reserve Bank of India). Daily SLR has been averaged during the fiscal year to get annual average SLR for the respective fiscal years.
FIGURE D.2. Share of Public Sector Banks, Private Banks and the RBI in Central Government Securities

A. Shares of RBI and Scheduled Commercial Banks

B. Shares of Private and Foreign Banks and Public Sector Banks

Source: Handbook of Statistics on Indian Economy, RBI.
TABLE D.1. Shares of Institutions in Holdings of Central Government Securities

<table>
<thead>
<tr>
<th></th>
<th>Insurance companies</th>
<th>Public sector banks</th>
<th>Private and foreign banks</th>
<th>RBI</th>
<th>Provident funds</th>
<th>Foreign institutional investors</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007-08</td>
<td>19.2</td>
<td>32.3</td>
<td>17.3</td>
<td>7.8</td>
<td>2.9</td>
<td>20.4</td>
<td></td>
</tr>
<tr>
<td>2008-09</td>
<td>17.0</td>
<td>31.6</td>
<td>16.1</td>
<td>8.5</td>
<td>3.0</td>
<td>23.7</td>
<td></td>
</tr>
<tr>
<td>2009-10</td>
<td>17.4</td>
<td>33.7</td>
<td>15.4</td>
<td>11.0</td>
<td>3.4</td>
<td>19.0</td>
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Source: Handbook of Statistics on Indian Economy, RBI. Others include Mutual Funds, Co-operative Banks, Primary Dealers, Financial Institutions, Corporates, and State Governments. Besides RBI and Scheduled Commercial Banks, the data for other institutions is only available since 2007-08.

FIGURE D.3. Shares of Institutions in Ownership of General Government Securities

Source: Handbook of Statistics on Indian Economy, RBI. Others include Mutual Funds, Co-operative Banks, Primary Dealers, Financial Institutions, Corporates, and State Governments. Besides the RBI and Scheduled Commercial Banks, the data for other institutions is only available from 2007-08.
### Table D.2: Shares of Institutions in Ownership of Total General Government Securities

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<th>Private and Foreign Banks</th>
<th>RBI Provident Funds</th>
<th>Foreign Institutional Investors</th>
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Source: Handbook of Statistics on Indian Economy, RBI. Others include Mutual Funds, Co-operative Banks, Financial Institutions, Corporates, and State Governments. Besides the RBI and Scheduled Commercial Banks, the data for other institutions is only available from 2007-08.

### Figure D.4: Concentration of Ownership in Central Government and General Government Securities

#### Herfindahl Index for Central Government

![Graph of Herfindahl Index for Central Government](image1)

#### Herfindahl Index for General Government

![Graph of Herfindahl Index for General Government](image2)

Source: Authors’ calculations. The index is calculated by adding the squared shares of RBI, Scheduled Commercial Banks, Provident Funds, Insurance Companies, Foreign Portfolio Investors, and Others (which include Mutual Funds, Co-operative Banks, Primary Dealers, Financial Institutions, Corporates, and State Governments) in total Central Government or General Government securities.
Comments and Discussion

Chair: N.K. Singh

15th Finance Commission

M. Govinda Rao
Takshashila Institution

This is an important paper with significant macroeconomic and fiscal implications. The paper is also timely as it brings out the urgency of fiscal consolidation to ensure sustainable public finances and debt reduction as the pandemic has pushed the public debt to a precarious level. I enjoyed reading the paper and entirely agree with the overall conclusions drawn and my comments will be only on some details.

Summary of the Paper

The paper begins with the observation that India’s fiscal deficit and public debt are among the highest in the developing world and emerging economies. This was so even before the COVID-19 crisis, and the pandemic has pushed the public debt to a precarious level. However, the good news is that despite the increase, the debt is expected to remain broadly stable under reasonable assumptions. The authors make different projections based on alternative assumptions. The baseline scenario assumes the continuation of the average values of real GDP growth, real interest rates, and the primary deficit–GDP ratios for the period, 2013-14 to 2022-23 for the next five years. This shows an increase in the debt-to-GDP ratio by 2.2 percentage points. The second scenario assumes a higher GDP growth of 7.9 per cent (as against the average of 5.7 percent) and that results in a reduction in the ratio by 5.5 percentage points. In the third scenario, the primary deficit is assumed to be lower at 1.9 percent as against the average of 2.9 percent, and that reduces the ratio by 2.6 percentage points. The contingent liabilities are assumed at 5 percent of GDP. The exercise is repeated for the Centre and State governments separately, but the overall conclusion is that the debt is expected to remain sustainable in the

* By preserve the sense of the discussions at the India Policy Forum, these discussants’ comments reflect the views expressed at the IPF and do not necessarily take into account revisions to the conference version of the paper in response to these and other comments in preparing the final, revised version published in this volume. The original conference version of the paper is available on NCAER’s website at the links provided at the end of this section.
medium term though, the elevated debt entails significant costs to the economy. Among the States, the paper draws attention to the precarious situation in the States of Punjab, Rajasthan, and Kerala, which are likely to face serious strains in ensuring sustainability.

The bad news from these simulations is that even under favorable assumptions, the general government debt-GDP ratio is unlikely to decline below 80 percent in the medium term, let alone attainment of the target of reducing it to the pre-pandemic FRBM target of 60 percent of GDP unless politically difficult reforms are undertaken. In fact, the Fourteenth Finance Commission had set a target of 58.24 in 2019-20, the terminal year of its recommendation. This underlines the need to implement measures both to accelerate GDP growth and to substantially reduce the primary deficit. In particular, the increasing requirements of social services, physical infrastructure, and green transition would make larger demands on expenditures and raising the revenue-GDP ratio in the medium term is difficult.

The paper underlines several problems and costs to the economy associated with elevated debt levels. These include: (i) a large share of interest payments in government revenues crowding out resources for the much-needed social and economic services; (ii) the inability to meet the requirements of emerging priorities; (iii) difficulties in calibrating counter-cyclical fiscal policy and responding to shocks; (iv) financial stability risks due to the commercial banks holding a large proportion of government securities; and (v) increased pressure to market the debt to foreign investors as the domestic captive market for government securities gets saturated.

Comments

As mentioned earlier, this is an important and timely paper, and has significant fiscal and macroeconomic implications for the economy, calling for urgency in policy reforms. The paper underlines the need for the government to take proactive measures to reduce the primary deficit to minimize the economic costs and distortions arising from the accumulation of debt. Although this may necessitate taking politically difficult decisions, particularly in an election year, proactive measures to achieve fiscal consolidation are imperative. I am in full agreement with the broad conclusions of the paper. The comments below are mainly on some of the details.

On the analysis of trends, we have seen a regular cycle of 8-10 years of spikes in fiscal deficits and these are mainly associated with the implementation of pay scales, increases in international oil prices, electoral giveaways, and declines in the tax ratio. The 1981 and 1991 fiscal deficit escalation was triggered by large increases in expenditures in the preceding years and the oil price increases. The only time the government succeeded in containing fiscal deficit according to
targets was during the first four years after passage of the Fiscal Responsibility and Budget Management Act (FRBM) in 2003. That was mainly due to the implementation of the Tax Information Network (TIN) in 2003-04, resulting in a sharp increase in the tax-GDP ratio, and steady expansion in the base of service tax. However, the gains were frittered away in 2008-09, not so much due to the Global Financial Crisis, as stated in the paper, but owning to the decision in the election year to implement the farm loan waiver, Pay Commission recommendations, and expansion of national employment guarantee from 200 districts to the entire country announced in the Budget for 2008-09.

The debt-dynamics equation that is generally used to analyze debt sustainability is a little too mechanical. According to the equation, when the primary deficit is zero, debt will decline if the growth rate of GDP is higher than the average interest rate paid by the government. It is possible to keep the interest cost on government borrowing low either through regulating the interest rates on government borrowing or through financial repression, and when the GDP growth rate exceeds the interest rate, debt will decline. But that would create distortions in the financial market, and crowd out private investments by driving up the borrowing costs. In the Indian context, the Statutory Liquidity Ratio (SLR) prescribes that commercial banks are required to invest 18 percent of their demand and time liabilities in government securities, and 40 percent of their lending must be earmarked to the priority sector. This drives up the commercial sector’s cost of borrowing with adverse impacts on its investments.

I have some reservations about the analysis of debt dynamics and simulations in the paper on both analytical and empirical grounds. Without taking away the seriousness of the problem, I think the results are a little too alarmist. On analytical grounds, making projections of debt under alternative assumptions does not consider the effect of inflation on debt and therefore, it is more appropriate to make the projections by taking nominal values of the variables rather than real values. This is because the numerator, the public debt at the beginning of the year, is the accumulation of net fiscal deficits over the years in historical prices, and the denominator, GDP, is in current prices. When there is high inflation, while the base year debt is in historical prices, the high value of GDP will reduce the ratio. On empirical grounds, it would be useful to estimate the average values excluding the year in which COVID-19 had a severe impact (2020-21) on the primary deficit and GDP growth. On contingent liabilities, the information itself is not very firm and there is a probability associated with contingent liabilities becoming real liabilities to the governments.

The paper underlines the carrying cost of the heavy debt burden on the economy. The interest cost claims almost 25 percent of the revenues. At 5 percent of GDP, it is much higher than the spending on education and healthcare taken together, and crowds out the much-needed resources for spending to strengthen the human and physical capital, and it weakens the ability of the government to calibrate counter-cyclical fiscal policy and to respond to shocks.
In addition to these, which are mentioned in the paper, the high debt ratio entails other costs as well. The international credit rating agencies keep the sovereign rating low when the deficits and debt are high, and this increases the cost of international commercial borrowing for Indian companies. Given the level of the household sector’s savings, pre-emption of a large volume of these savings by the government reduces the borrowing space available to the private sector, resulting in financially crowding out productive commercial sectors. Besides all these, the debt today has to be serviced and repaid by levying taxes tomorrow and there are intergenerational equity questions. For all these reasons, it is necessary to take measures to control deficits and debt.

While the problem of costs and distortions arising from the accumulation of large debt is highlighted in the paper, it would add immense value to the paper if it addresses the issue of policy measures that the government should take to bring down the debt. Fortunately, the implementation of Goods and Services Tax (GST) has started yielding results. As the technology platform has stabilized, tax compliance has shown significant improvement. Besides, GST has helped the economy to become more formalized. The common numbering system with the Permanent Account Number (PAN) of income tax helps in comparing the GST returns with income tax returns and the compliances of both taxes are likely to increase in the medium term. This is likely to enhance the revenue productivity of the tax system to provide some cushion to reduce the primary deficit.

The last two budgets have seen greater transparency and a greater focus on containing revenue expenditures to release more resources to capital expenditures. The Union Finance Minister has promised that the Centre’s fiscal deficit will be contained at 4.5 percent of GDP by 2025-26. Hopefully, despite the general elections to be held in 2024, there will be attempts to continue the fiscal consolidation process. One area where the past efforts of the government have not borne the expected success is in realizing the disinvestment targets and monetizing the assets of public sector enterprises. It is important to relook at the role of the government, which is to promote the private sector and not to compete with it, and what is required is to regulate the private sector to prevent predatory competition. It is important to accelerate the process of disinvestment and privatization, and use the proceeds to pay off the debt.

Macroeconomic stabilization is predominantly a Central function, and the States have no inherent incentive to contain their deficits and debt except to the extent that large interest payments crowd out other expenditures. Considering that this is a Central responsibility, it is necessary to avoid bailouts and enforce hard budget constraints. Article 293(3) of the Constitution requires the States to seek permission from the Centre to borrow so long as they are indebted to the Centre. All the States have enacted their FRBM Acts, and it is necessary to ensure that the States adhere to the targets set in their Acts and are not allowed to borrow more than what is set out. There should be strict supervision and
monitoring of off-budget borrowing and other fiscal risks. Although in the past, the States were incentivized to levy the property tax at the local level, not much progress is seen. The power sector continues to bleed the States. As far as the States are concerned, the time has come to question whether the large number of enterprises run by them serve any public purpose. Many States run commercial enterprises, including hotels, and it is time to divest them and monetize the large parcels of land and other assets to pay off the debt.

Overall, this is an important contribution and hopefully, the policymakers will take cognizance of the problem and initiate steps to reduce fiscal deficits and debt to ensure greater fiscal and macroeconomic stability.

Kenneth Kletzer
University of California, Santa Cruz

The authors have presented an extremely interesting and helpful paper on the challenges that the rise in India’s outstanding public debt during COVID pose for fiscal policy. I really enjoyed reading the paper. It provides a very clear and detailed story of the dynamics and sustainability of public debt and deficits. The diagnostic approach taken in the analysis is very well suited for examining debt sustainability and identifying the potential consequences of maintaining India’s present levels of government debt and deficits. Indeed, the paper concludes the diagnosis with a general plan of treatment. There’s a lot of information here, all of it relevant and important for understanding India’s public debt. The authors have done such a thoughtful and detailed analysis that I am left with highlighting points and making some small observations.

As we have seen, General Government debt sharply increased with the public spending needed to maintain household welfare and support business enterprise viability through the pandemic lockdown. The government appropriately sought to smooth consumption under an adverse shock by borrowing against repayments from future output. One way to meet such increases in debt is to pay the interest due in perpetuity, maintaining the debt-to-output ratio. This might be appropriate if all fiscal policies are constrained first-best policies. The concern of this paper is that India’s post-COVID level of public debt may be unsustainable or inefficiently high, and that fiscal policy changes are needed. The first results indicate that despite persistent primary deficits, the consolidated government debt-to-output ratio is likely to be sustainable, given the interest costs of the current debt portfolio and projecting recent GDP growth rates forward. As persuasively argued by the authors, this is not enough in a risky policy-making environment, nor for the anticipated future expenditures for adapting to climate change.

The presentation of the facts on debts and deficits of the Central and State governments is thorough and to the point. I particularly appreciate the detail of
the Appendix and the depiction of trends in government finances. The paper’s analysis of debt sustainability considers both the government’s capacity to maintain the present debt-to-GDP ratio and to avoid rollover risk managing its debt. The Government of India has long enjoyed the ability to borrow at long maturities, and the authors’ conclusion that rollover risk is not a serious concern seems safe.

The paper evaluates debt sustainability by using estimated growth rates, interest rates, and projected primary deficits to simulate alternative paths for debt-to-GDP ratios for sensible scenarios. I think this approach is insightful and appropriate, though it contrasts with the econometric alternatives of presenting stationarity tests or estimates of fiscal rules. The problem with time series tests of debt sustainability is that these need to assume that the real interest rates and output growth are given. With stochastic interest rates, stationarity tests on the present value of net debt are unreliable. As the summary statistics shown in the paper reveal, the variation in real interest rates for India’s public debt is large and the covariances of interest and growth rates with each other as well as with the primary deficit ratio are evident. Appendix C shows the covariation between interest rates (nominal and real) and the debt-to-GDP ratio in time series plots and regressions. These illustrate the point that the assumptions underlying conventional stationarity tests are not supported. The typical alternative is to estimate a fiscal rule that relates the primary deficit to the debt-to-output ratio. I am not sure if a regression should be added because the plots of primary deficits illustrate very clearly that the response of the consolidated and separate Centre and State primary surplus-to-debt ratios is weak at best. Overall, I think the authors have chosen a very informative way to look at India’s debt sustainability.

As the authors argue, a sustainable debt-to-output ratio may not be a desirable level of public debt. The primary premise of the paper is that India’s debt is excessive in terms of the opportunity cost of interest payments. These costs include foregone spending on social and economic priorities and insufficient capacity to accommodate the risk of negative shocks. Although the baseline positive differential between the growth rate and trend real interest rates implies a sustainable debt-to-output ratio, as the authors emphasized the risk posed by contingent liabilities, especially those of the States, is salient. The volatility of growth and interest rate poses another risk to sustainability, contributing to the argument for reducing public debt from its current level. The simulations provide some idea of how great these risks are, but they depend on selected scenarios. Perhaps, estimated moments for the growth rate and real interest rate could be used to quantify the risk in terms of fluctuations of the primary deficit that would be necessary to maintain the current debt-to-output ratio. However, contingent liability risk is more difficult to estimate.

The remaining two items on the list of the potential costs of high public debt are financial risks. Despite the reduction in the Statutory Liquidity Ratio (SLR), commercial banks, both private and State-owned banks, continue to
hold sizable shares of their assets in government bonds. The authors suggest an interesting potential risk to financial stability when banks hold large amounts of government bonds. The recent experience of Silicon Valley Bank underlines that banks need to attend to interest rate and inflation risk when they hold long maturity bonds, even of high quality, against deposits. The reforms leading to the development of the government bond market and relieving the banks of holding public debt at below market interest rates might have created this new risk. Rather than lend to the private sector, banks opted for government bonds paying market rates. It would be ironic if the ability of the government to borrow at long maturities and risk-averse bank management led to a bank crisis.

I think the paper makes a good point worth regulatory attention.

The second financial risk noted in the paper is that further financial liberalization may reduce domestic financial institutional holdings of government debt, leading to a greater reliance on international markets for India’s public debt. The fact that public debt is auctioned and traded at market rates does not mean that requirements to hold government bonds do not suppress interest rates. I have made this point here in the past. Further financial reforms and progress in banking could lead to an increase in government borrowing costs. It is interesting that the regression of interest rates on the debt-to-GDP ratio in the Appendices shows a negative relationship. Over the data horizon, financial liberalization and reform progressed so they may not actually have an adverse effect on borrowing costs.

Moving to the proposed policy responses, I think the authors make a convincing case that fiscal consolidation should depend on increasing public revenue rather than on expenditure reduction. They make an important contribution by comparing the consequences for growth of the public expenditure reductions to reduce government debt in 1991-92 with those of revenue increases in 2004-05 and 2012-13. The observation that the latter reforms did not last provides support for their strong conclusion that substantial fiscal reforms are necessary to reduce public debt.

In conclusion, this is an excellent paper on a pressing topic for fiscal policy in India. I think it makes its case for debt reduction and for new fiscal reforms to raise revenues, address contingent government liabilities, and mitigate moral hazard in fiscal devolution. I want to applaud how thoroughly the text and Appendices report the magnitudes and relationships in the data and how well the analysis is done and presented.

General Discussion

Martin Wolf commenced the discussion by highlighting how he is not worried about India when it comes to fiscal problems and rising debt levels, particularly when India’s debt levels are compared to those of advanced economies like
the United States. He added that for India, what is crucial is the relationship between the real rate of growth and the real rate of interest. Further, he suggested that inflation adjustment is essential, and nominal figures can be really quite misleading. He asked: What are the obstacles to raising the revenue ratio by 3 or 4 percentage points? What can any government do about it?

The Chair of the session, N.K. Singh answered Martin Wolf’s question by elaborating on the overall revenue structure for India and sharing his own experiences. He said that one inescapable conclusion he derived during his visits to the States in India was that after the enactment of the Goods and Services Tax (GST), the extent of autonomy that the States have on a wide range of taxes in their hands has been circumscribed greatly. The issue thus is how a State can levy indirect taxes. He added that even the idea of whether the States should be given latitude on direct taxes and leeway to have their own income tax in some form or another, which exists in many parts of the world, has met with huge opposition from the revenue department. He further explained that except for alcohol and a couple of other items, an area whose potential has not been fully realized in this country and offers States a huge scope to generate revenue, is property tax. He stated that second-generation reforms must now be introduced, while broadening the base and rationalizing the tax rates. He took forward the discussion on States and their lack of interest in the issue of property tax for the purposes of running the local bodies. He explained that Finance Commissions are not obliged to allocate financial resources to the local bodies; all that the Constitution says is that just as the President appoints the Central Finance Commission, the Governors of each State shall appoint a State Finance Commission at the end of exactly five years to help them improve the Consolidated Fund of the State, enabling them to fund the local bodies. In practice, what has happened is that successive Finance Commissions have continued to allocate large resources for the working of local bodies. This has absolved the State governments of the pressure to find mechanisms for raising finances.

M. Govinda Rao mentioned that an important issue in many developing countries, and particularly so in India, is the prevalence of a large number of tax preferences in the income tax system. In the last couple of years, the Finance Minister has tried to introduce an alternative tax system, with lower tax preferences and reduced rates. Another major issue is agricultural income tax, as despite the increasing commercialization of agriculture, revenue generation in this sector remains low. He also asked: Is it possible or fair to commit future generations to fiscal baptism?

Barry Eichengreen answered the above question by explaining about the political economy of fiscal policy. The growing deficit bias in the U.S.A. and in a variety of other advanced economies leads to a situation where taxes are cut in order to hamstring future governments with a different set of policy priorities that have become more attractive. So, spending now by a government on its
favorite public programs before giving office to another government with very
different preferences has become more prevalent. He added that the authors
have tried to strike a balance between being fiscally sanguine and being fiscally
alarmist. The favorable growth rate and interest rate differentials that India has
enjoyed are not guaranteed into the indefinite future, and they have described
some reasons for that claim. The evolution of the debt ratio depends not only
on the overall growth rate and interest rate differentials, but also on the primary
budget deficit and India’s overall budget deficit approaching 10 percent of GDP.
Finally, he highlighted that accounting for inflation shows up as a contributing
factor to debt consolidation in the authors’ analysis, especially in the two debt
reduction episodes that they look at in the paper, the first starting in 1991 for
about six years, and the second starting in 2004 for about six years.

Poonam Gupta elaborated on the many challenges that were being discussed
regarding the current level of debt, and the question of whether it was the right
time to be an alarmist or a fiscal fundamentalist. She said that the question
remains: Should we still be balanced in our approach and use some other
measures? One such measure is already in the paper, which is climate transition
and other priorities. Debt levels have not been a problem so far because of a
very high household financial savings rate. The savings within the country are
enough to be able to finance the deficit efficiently through financial repression,
and consequently, the stress will not be seen in the market. Household net
financial savings have started coming down because households have also
started borrowing for their durable needs, and the equation may change in
time, but we have no way to project when it will happen. Other challenges
include the current level of public debt impacting the policy choices of the
government. She also suggested that whenever a Finance Commission is set up,
through horizontal devolution of taxes, richer States subsidize the poorer States.
Another subsidization that happens is that of more prudent states subsidizing
the profligate ones, which is true in the interest rate evening out. For instance,
Gujarat can certainly borrow at a rate lower than Punjab, but these interest rates
are being kept uniform.

Ratna Sahay referred to an IMF study, which found that financial crises are
related not to debt levels but to rollover risks and the ability to service debt,
which is what markets care about. This relates to the question that was raised
earlier about how to convince policymakers because they are not concerned
about fiscal deficits; what they do care about is actually growth and inflation.

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https://www.ncaer.org/IPF2023/Agenda.pdf
Is Electrification in India Fiscally Sustainable?§

ABSTRACT We study the fiscal health of state electricity distribution companies (discoms) in India and its bearing on the supply of electricity. India has, in a policy landmark, lately achieved near-universal household electrification, in large part through Central funding of infrastructure totaling Rs 5 lakh crore as well as State bailouts totaling Rs 3.5 lakh crore since 2001 (both figures in 2022 Rs, totaling roughly USD 110 billion). Central and State transfers enable State distribution companies to run ongoing losses, which, in turn, threaten the supply of energy to agriculture and rural households. We find that: (i) the fiscal health of State distribution companies remains an issue of concern, with declared losses of only 2 percent in 2021-22, far lower than recent trends, rising to 22 percent when excluding Central and State government subsidies; (ii) the proportional losses of the distribution companies, excluding subsidies from the Central and State governments, have declined by 6 percentage points (on a base of 28 percent) in the last decade, but their aggregate yearly loss has increased by Rs 77,000 crore (43 percent) due to growth in subsidized consumption; (iii) most gains in reported discom finances are due to the increasing formalization of States bringing electricity subsidies onto their budgets; (iv) States that drew funds under the most recent Central bailout program (the UDAY scheme) have seen smaller gains in efficiency and reductions in losses in recent years than states that did not participate in the bailout. We conclude by discussing the promise of delivering subsidies via Direct Benefit Transfers for Electricity (DBT-E) to give discoms incentives for both fiscal independence and more reliable supply and service.

Keywords: Public Sector Reform, Electricity, Government Bailouts, Direct Benefit Transfer

JEL Classification: L94, Q48, H83

§ The authors thank Priyadarshini Sundar and Jingze Dong for providing excellent research support in data collection, cleaning, and analysis.
1. **Introduction: Electrification Achieved, Electrification at Risk**

Electrification has been a landmark of economic development for more than a century and electricity continues to find new uses today. The Government of India, after decades of effort and investment, in 2019 declared household electrification to be complete. While no census has been run as confirmation, multiple sources of data show that grid electrification has indeed reached near-universal levels (the electrification rate in the nationally representative National Family Health Survey V, 2019-21 was reported at 96.8 percent; see Figure 1). The pace of electrification has been rapid. In lagging States of Northern and Eastern India, the household electrification rate, from the time of the 2011 Census, has leapt up by 43 percentage points in West Bengal, 48 percentage points in Jharkhand, 53 percentage points in Odisha and Uttar Pradesh, and a staggering 79 percentage points in Bihar (Figure 2).

**Figure 1. Household Electrification in India, 1980–2021**

Source and Note: The data for years 1981, 2001 and 2011 are sourced from Census, and covers all the States. The data for years 2015 and 2018 includes about 9000 households that were covered in the ACCESS survey (six States were covered—Bihar, Jharkhand, Madhya Pradesh, Odisha, Uttar Pradesh, and West Bengal). Data for 1993, 2009, 2012 and 2018 is from the NSS survey (Drinking Water, Sanitation, Hygiene and Housing Condition in India) and indicates the percentage of electricity used by households for domestic use. The years 2016 and 2021 were covered under the National Family Health Survey (NFHS) and indicates the percentage of the population living in households with electricity. Data for the years 2017 and 2019 captured under Saubhagya indicates the percentage of houses that were electrified under the scheme, from the total unelectrified households identified under the scheme at the time of implementation. India Human Development Survey (IHDS) provides the data for 2005 and 2012, based on a survey across 42,000 households.
The historic completion of household electrification in India is a feat not mainly of engineering but of fiscal capacity, and specifically cooperation across the Central and State governments. The Central Government invested in lagging States through a succession of infrastructure investment and connection subsidy programs, including, most recently, the Rajiv Gandhi Gramin Vidyutikaran Yojana, to extend the grid to all villages, and the Pradhan Mantri Sahaj Bijli Har Ghar Yojana (“Saubhagya”) scheme, to then reach all households. At the final stage of this “big push” for electrification, new electricity connections, which cost Rs 3,374 per household to provide,¹ were given out for free to all Below the Poverty Line (BPL) households and at a nominal cost of Rs 500 to rural Above the Poverty Line (APL) households (which some States have also waived). Once on the grid, newly-connected households in many States enjoyed domestic tariffs below the cost of energy supply. Even this number

¹ As of June, 2021, Rs 8,840 crore was released to States to electrify 262 lakh households, yielding an average cost of connection as calculated. See https://powermin.gov.in/en/content/saubhagya for details.
under-states the support to households via the electricity grid, since high rates of non-payment lower the effective tariff further, and power for agricultural use is often free. This generous support for both new connections and the supply of electricity is a main reason why India has been able to achieve universal electrification at a relatively low level of per capita national income (Lee et al. 2020).²

Is electrification in India fiscally sustainable? India has achieved universal electrification by treating electricity not as a business, but as a right. The Prime Minister stated this explicitly, “Everyone has a right to a life of dignity. Traditionally, food and shelter have been seen as the most basic necessities. However, the Modi government has gone beyond this core basket of necessities to include even electricity” (Modi 2019). The policy goal of improving the lives of low-income households by connecting them to the grid may raise social welfare. However, the treatment of electricity as a right may undermine the reliability of electricity supply to both newly-connected households and those already on the grid (Burgess et al. 2020). The risk for electrification achieved through a large dose of external support is of backsliding: are the States, which were not capable of completing electrification on their own, able nonetheless to maintain supply? Many of the State distribution companies that supply power in India are in a poor fiscal position and remain dependent on State and Central support to stay afloat. If these long-standing problems are not ameliorated, the huge investment in electrification may increase the fiscal strain on state distribution companies and undercut power supply in the years to come.

This paper attempts to draw out a path through which electrification can be fiscally sustained while providing reliable electricity supply. We have three main aims; first, to review the fiscal position of State electricity distribution companies in India and to decompose the reasons for ongoing losses; second, to relate the fiscal position of discoms to both recent funding programs and the stress created by universal electrification; and third, to suggest what institutional investments and technological reforms might plausibly help to increase fiscal discipline on the part of States and sustain power supply.

In the first part of the paper, we review the fiscal position of the State distribution companies (hereafter, discoms). We find that the fiscal position of the distribution companies is poor and, when considered before the receipt of State subsidies, has remained essentially unimproved for the last decade, despite large Central Government investments. The average discom runs a large operating loss. In fiscal year 2021-22, India’s discoms in aggregate had losses of Rs 16,968 crore (Rs 169.68 billion), representing 2 percent of total discom expenditures (it has fallen from Rs 70,398 crore, that is, 9.3 percent

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² It is probably also the reason why household solar systems, which have a large market share among households in sub-Saharan Africa, even in areas with the grid, have been relegated to a small role in the Indian market (Burgess et al. 2023).
of the total expenditures, in 2020-21). This number counts subsidies and some kinds of Central support as revenue. Without these sources of income, discom losses balloon to Rs 178,694 crore, representing 22 percent of total discom expenditures or roughly 1 percent of India’s Gross Domestic Product (this figure stood at Rs 187,903 crore, 25 percent of the total discom expenditures, in 2020-21). This loss as a proportion of expenditures has been nearly flat since 2009-10, but, as discom expenditures have increased, the absolute level of losses has grown. The main progress that has been made in recent years, exemplified by the contrast between 2020-21 and 2021-22, is that States have brought ongoing discom losses onto their books in the form of greater budgeted subsidy expenditures. State support to discoms constitutes a significant portion of their budget. Additionally, other income, revenue grants, and regulatory income are added by discoms to their revenue on a booked basis, though not all of them realize. Devaguptapu and Tongia (2023) discuss the breakdown of discom finances in a comprehensive way by decomposing discom finances using cash-flow accounting, as compared to the accrual-based accounting followed by PFC. As shown in Devaguptapu and Tongia (2023), losses using cash-flow accounting are much higher as compared to losses reported on the book. For 2020-21, the ACS-ARR gap (after including all subsidies, grants and income) for state discoms is Rs 1.14 when calculated using cash-flow accounting, as compared to Rs 0.64 reported in the PFC report. The way discom finances are currently being reported, it becomes difficult to track losses.

The magnitude of the discom losses in aggregate is staggering. As a basis for comparison, the total expenditure in 2020-21 on the Mahatma Gandhi National Rural Employment Guarantee Programme (MGNREGP) was estimated at Rs 61,500 crore, and on the Pradhan Mantri Kisan Samman Nidhi (PM-Kisan) scheme at Rs 75,000 crore (Budget of India 2020). Distribution company losses and subsidies are larger than the combined expenditures on these two flagship schemes—with enough of a gap left over to cover the National Education Mission and the Swachh Bharat Mission, for good measure. We show that even these discom operating losses and subsidies are an understatement of government support to the electricity sector, since many of the fixed costs of investment in the power grid have also been built with Central Government support.

In the second part of the paper, we attribute distribution company losses to underlying structural problems in the power sector. The proximate cause of operating losses is that distribution companies buy more power than they sell and often sell power below the cost of purchase. On average, across all of India, in FY 2021-22, the most recent year for which data is available, the average cost of supply is Rs 6.29 per kWh. Against this figure, distribution companies bill Rs 6.02 per kWh (95.7 percent of the cost) and collect Rs 6.12 (97.3 percent of the cost). However, this number over-states the financial performance of discoms, since much of what they bill and collect is paid by State governments and not
customers. If we exclude revenue from subsidies and Central Government contributions, collections from paying customers amount to Rs 4.35 per kWh, only 69 percent of the cost. Moreover, the FY 2021-22 subsidy commitment from State governments to discoms is well above recent norms. It remains to be seen if these transfers will be sustained.

The largest risks to distribution company finances are, therefore, twofold: first, power that is never billed, either because of technical losses in distribution or theft; and second, power that is billed but to the government and not to customers. This second category is a risk because historically State governments have funded only a part of the subsidies that their own State distribution companies book so that distribution companies run up debt over time. Only in 2021-22—an exceptional year since 2009—the States’ tariff transfer was higher than the subsidy billed. In all other years from 2009 till 2021, the State tariff subsidy transfer to discoms was less than the subsidy billed by discoms to States—totaling up to a Rs 86,000 crore shortfall on the discoms’ books. Indeed, States have an incentive to do so, in order to build up debt that can be reduced in periodic Central bailouts. Each unit of power paid with debt costs the State less than if it were paid in full upfront, once bailouts are taken into account. It is also hard to take distribution company accounting at face value, since, in the absence of thorough energy accounts, booking a high degree of consumption to subsidized consumers, and therefore State governments, can be used to paper over inefficiency, losses, and theft.

The weak fiscal position of State discoms and the incentives created by bailouts keep electricity distribution dependent on Central Government support. We analyze how fiscal indicators have responded to the most recent Central Government program of State support, the Ujjwal Discom Assurance Yojana (UDAY), launched in 2015, in which the Central Government requires States to assume 75 percent of discom debt and offers additional grant and equity support. We find that there has been essentially no change in the last ten years in the share of discom operating expenditures covered by revenue from paying customers. Excluding State and Central subsidies, distribution companies ran, on average, operating losses of 22 percent in FY 2021-22, as compared to operating losses of 24 percent in FY 2010-11. The main fiscal change in 2021-22, when compared to earlier years, is that State and Central support have been brought onto the books to a greater extent, so that losses net of State subsidies have declined. Aggregate Technical and Commercial (ATC) losses—an omnibus measure of power that is supplied but not paid for—have declined, though at a moderate pace, from 31.5 percent in FY 2009-10 to 16.6 percent, still well above global norms, in FY 2021-22. Interestingly, once we drop the energy sold to the agricultural sector and the State subsidy booked and received against it, ATC losses appear mostly stagnant, changing marginally from 42.0 percent to 39.6 percent over the same ten-year period. Moreover, in the period after UDAY, ATC losses stagnated at a high level for States that participated, so
that ATC losses for States taking UDAY funds rose by 5 percentage points as compared to States that did not take UDAY funds. The lagging States are still lagging, and UDAY did not provide a forceful incentive to improve operational performance.

The risk of this stagnation is that the additional customers added by the achievement of universal electrification may compound the fiscal losses of discoms and lead to a deterioration in power supply. Distribution companies that run up debt tend to delay payments to power generators; the risk of non-payment, in turn raises power procurement costs (Ryan 2021). Newly connected customers tend to be rural and poorer than customers already on the grid, which may tend to increase discom losses over time.

The final part of the paper turns to policy solutions to the problem of discom finances. The modern era of the Indian electricity sector can be dated from the Electricity Act of 2003 and associated reforms (Kumar and Chatterjee 2012). Many knowledgeable commentators, from academics to participants in the Indian power sector, have discussed the slow progress of distribution reform and specifically the need for discoms to adopt a more commercial orientation (Bhattacharya and Patel 2008; Wolak 2008). The poor state of distribution company finances has been thoroughly and recently documented (Devaguptapu and Tongia 2023). We, therefore, feel comfortable taking a narrow approach to policy recommendations and emphasize one main idea:

*All subsidies must be delivered via direct benefit transfers for electricity (DBT-E) directly to each customer, rather than to the distribution company on their behalf.*

Why Direct Benefit Transfers (DBT)? The fundamental problem is that the distribution companies serve governments: the State, to draw subsidies, and the Centre, for distribution infrastructure investments and bailout funds. The discoms do not serve, as their main or only audience, customers. It is this disconnection that distorts the fiscal incentives of discoms and threatens the reliability of power supply. Yet the fact that discoms do not have a “commercial orientation” is to be expected when their solvency does not depend on customers. Only in a system where subsidies to customers flow through the customers themselves will the discoms serve those customers and not the State.

The investments of the last decade have made universal DBT feasible in the electricity sector. First, *Aadhaar* and linked bank accounts mean that households have a pre-existing financial connection to the government through which to receive subsidies. Second, as noted above, more of the subsidies to the electricity sector have moved from off-the-books to on-the-books over the last decade, which is a pre-requisite for redirecting those subsidies to customers. Third, investments in metering infrastructure, both past and ongoing through the Revamped Distribution Sector Scheme (RDSS), have formalized many customers and made it possible to measure consumption more accurately at the customer level.
There is no panacea for distribution reform; however, this single change to universal DBT would at least align the incentives of the distribution companies with service to their customers. There is no reason why the States should be paying subsidies on consumption as aggregated and reported by the distribution companies, rather than paying subsidies on consumption to the customers who are using the power. Under such a system, the discoms would naturally assume a commercial orientation, because their viability would rely entirely on collecting revenue from customers.

The rest of the paper goes as follows. In Section 2, we describe how fiscal federalism in the electricity sector has both enabled universal electrification and perpetuated fiscal losses and poor operating performance in State distribution companies. In Section 3, we summarize the fiscal performance of State discoms in the last decade, emphasizing the relative stagnation of operating indicators in states taking UDAY funds over the last five years. In Section 4, we discuss our policy recommendation and how it interacts with planned investments in the sector in the next several years. In Section 5, we conclude the paper.

2. Fiscal Federalism as Both a Blessing and a Risk for Electrification

The Government of India and the States both serve major and interdependent roles in the electricity sector. Electricity is part of the concurrent list (Seventh Schedule, List III) of the Indian Constitution, meaning that both the Government of India and the various States can make laws concerning electricity. The States run electricity distribution, transmission and generation companies and also regulate intra-state matters via State Electricity Regulatory Commissions (SERCs). The Centre has an overarching regulatory role, performed by the Central Electricity Regulatory Commission, and roles of system coordination, operations and planning via institutions such as the National Load Dispatch Center (NLDC) and Central Electricity Authority (CEA). These Central policy and coordination functions are common in electricity systems around the world. In India, the Centre also has a direct role in investment and fiscal support to all segments of the electricity sector. The National Thermal Power Corporation (NTPC) generates electricity. The Solar Energy Corporation of India (SECI) and NTPC procure solar power. The Ministry of Power (MoP) and the Rural Electrification Corporation (REC) invest in transmission and distribution, via programs of investment support to the States and their discoms.

The progress of electrification in India has to be understood as the consequence of this fiscal federalism in the electricity sector. Electrification has been achieved due to massive Central investments in transmission and distribution infrastructure and new household connections. Electrification is at risk because, with States having connected many households through a great reliance on Central support, the State discoms may themselves be unable
to sustain electricity supply to tens of millions of new customers, who are often rural, poor, and not remunerative to serve. Universal electrification, in other words, may exacerbate the dependence of State distribution companies on Central funds, which has been an ongoing source of fiscal instability in the sector. The main question in the electricity sector is, therefore, how the Centre can ensure that electrification is sustained without also sustaining, or worsening, this dependence.

2.1. Central Support for Investments in Electrification

Universal electrification in India has been achieved by the Union of India investing in lagging States to pull them up to a common, national standard (Lakshamanan 2022). As recently as the 2011 Census, the electrification rates in States like Bihar (16.4 percent), Uttar Pradesh (36.8 percent), Jharkhand (45.8 percent), and Odisha (43 percent) reflected a countryside that was largely dark at night, with electrification reaching public facilities but few household connections. Several massive national investment programs helped States invest in infrastructure and household connections. The most recent nationally representative survey we could find, conducted independently of the electrification campaign itself, is the National Family and Health Survey (NFHS), 2019-21. The NFHS asks households, “Does your household have electricity?” By 2021, NFHS data show 96.8 percent of households reporting that they use electricity for lighting. The rates in lagging States have leapt up to 95.6 percent in Bihar, 89.8 percent in Uttar Pradesh, 93.8 percent in Jharkhand, and 96.3 percent in Odisha (see Figure 2).

This electrification was accomplished in stages with continual Central support across multiple governments. The major programs in the last two decades include the following:

- **Rajiv Gandhi Grameen Vidyutikaran Yojana** (RGGVY), 2005 - 2009. The RGGVY invested Rs 82,308 crore in distribution infrastructure and household connections across the 10th, 11th, and 12th five-year plan periods. The initial target of the program was to connect approximately 100,000 unelectrified villages and to increase household connections in an additional 300,000 villages (Burlig and Preonas 2022).
- **Deendayal Upadhyaya Gram Jyoti Yojana** (DDUGJY), 2013-2022. A program of transmission and distribution infrastructure investment, designed to support higher levels of rural power supply and household connections.
- **Pradhan Mantri Sahaj Bijli Har Ghar Yojana** (Saubhagya), 2017-2019. Under Saubhagya, the charges for household electricity connections were further reduced to Rs 500 for APL households and zero for BPL households. The Central Government supported 90 percent of the cost of connections in special category States and 75 percent in all other States.
• **Integrated Power Development Scheme (IPDS), 2014–2021.** Investments in low-voltage transmission and distribution network, feeder and distribution transformer metering, and advanced metering infrastructure (AMI). Expenditures of roughly Rs 9,000 crore through 2019 (Shankar and Avni 2021).

• **Restructured Accelerated Power Development and Reforms Program (RAPDRP), 2008–2014.** Investments in transmission and distribution infrastructure in urban areas, including both traditional infrastructure (sub-stations, transmission lines) and information technology investments for metering of electricity flows in the grid.

• **Revamped Distribution Sector Scheme (RDSS), 2021-2026.** The RDSS is a program of investment in electricity distribution and particularly in smart meters and the segregation of feeders. The aim of the program is to reduce aggregate technical and commercial losses to 12-15 percent by 2024–2025, and to increase the reliability of power supply. The RDSS has a budget estimate of Rs 97,631 crore towards a total expected outlay of Rs 303,758 crore over five years.

### 2.2. Central Bailouts of State Distribution Companies

The above programs provide Central funding for investment by State distribution companies in fixed infrastructure. These outlays, while large, are only a part of the Central support for State investments in power. Additional channels of support include lending by public sector banks to State distribution companies and periodic bailouts by the Central Government of the States and State discoms.

We tabulate large-scale bailouts in Table 1. Since the year 2001, there have been four large-scale bailouts of distribution companies, with an average expenditure of 1.42 percent of GDP per bailout. This budgetary expenditure is, again, probably an under-statement of the extent of fiscal support to the States, because the structure of a typical bailout includes debt restructuring wherein the public sector banks assume a portion of distribution company debts at very low base rates. As distribution companies are functionally bankrupt at the time of these refinancing episodes, it is unlikely that they could secure funding from a private sector lender on any terms. It is, therefore, difficult to calculate the value of the interest rate subsidy offered through public lending.

These bailouts are meant to have two purposes—to restore distribution companies to fiscal health, and to foster investments and institutional reforms meant to prevent future losses and debt accumulation. Bhattacharya and Patel (2008) call this second purpose a “commercial orientation” for discoms. Historically, bailouts have only had any success on the first count of restoring fiscal health, and even in that case, any success has been temporary. No program of reform has achieved commercial orientation.
<table>
<thead>
<tr>
<th>Year</th>
<th>Creditors</th>
<th>Current Value (in Thousand Crore Rs)</th>
<th>Constant Value (2022, in Thousand Crore Rs)</th>
<th>% GDP</th>
<th>Financial Terms</th>
<th>Incentive Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>2020 (Atmanirbhar Bharat Abhiyan Package)</td>
<td>Generators and Govt Finance Institutions</td>
<td>90</td>
<td>76.6</td>
<td>0.44%</td>
<td>Liquidity injection divided into two tranches: the first contingent on a repayment to creditors and the second contingent on not having any bills overdue and having a plan to bring down technical losses.</td>
<td>Intended as a stopgap measure until the Electricity Act Reform is introduced.</td>
</tr>
<tr>
<td>2015 (Ujjwal Discom Assurance Yojana)</td>
<td>Banks</td>
<td>209</td>
<td>148.6</td>
<td>1.52%</td>
<td>States shall take over 75% of DISCOM debt as on September 30, 2015 over two years. 50% of DISCOM debt shall be taken over in 2015-16 and 25% in 2016-17. States taking over and funding at least 50% of the future losses.</td>
<td>Operational attempts to reduce deficit, such as reducing losses and increasing efficiency.</td>
</tr>
<tr>
<td>2012 (Name of Bailout Scheme)</td>
<td>Banks</td>
<td>190</td>
<td>120.4</td>
<td>1.91%</td>
<td>States required to take on 50% of outstanding short-term liabilities up to March 31, 2012. They will be converted into bonds and issued to lenders. With liability falling to the States. The other 50% will be restructured such that there will be a 3-year moratorium on repayments.</td>
<td>Performance incentives issued by Central Government for meeting certain operational and financial targets.</td>
</tr>
<tr>
<td>2001-2002*</td>
<td>Centrally owned generators/ CPSUs</td>
<td>40</td>
<td>12</td>
<td>1.84%</td>
<td>50% of the interest on delayed payments was waived and the remaining amount (full principal + remaining interest) converted into bonds by the State government.</td>
<td>APDRP and Electricity Act of 2003 intended to deliver increased profitability for discoms and structural reforms to the power sector, respectively.</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>529</strong></td>
<td><strong>357.6</strong></td>
<td></td>
<td><strong>529</strong></td>
<td><strong>357.6</strong></td>
</tr>
</tbody>
</table>

Source: Reproduced Table B2 from Ryan (2021).
The dual purpose of bailouts can be seen in the Central response to the payments crisis of 2000-01. The Centre simultaneously intervened with a bailout, the so-called One Time Settlement (OTS) scheme, as well as a program of distribution reforms (initially the Accelerated Power Development Programme, or APDP, later reworked into the Accelerated Power Sector Development and Reform Programme, or APDRP) (Bhattacharya and Patel 2008). The bailout component of the intervention involved State governments assuming the liabilities of State distribution companies through tax-free bonds backed by the Reserve Bank of India. The total value of the bailout amounted to approximately Rs 40,000 crore. The investment component was meant specifically to fund investments in transmission and distribution that would help reduce losses and increase revenue collection. The Central Government was, therefore, at once supporting debt relief but attempting to head off the need for further relief in the future.

The reform program embodied in the APDRP did not impart fiscal discipline. About a decade after the “One Time Settlement” program, discoms had accumulated a large stock of debt, and the Centre again intervened, offering a Rs 1,90,000 crore Financial Restructuring Plan. The package restructured discom liabilities into a combination of long-term State bonds and loans, subject to a three-year moratorium on principal payments, and imposed performance conditions including tariff increases and reductions in losses. However, as shown in Table 2, State discom losses continued at roughly their prior rate of Rs 70,000 crore per year in 2012-13 and 2013-14. The States that adopted the bailout terms did not meet the performance criteria. Mr Piyush Goyal, the Minister for Power, Coal and New and Renewable Energy, remarked, “We have inherited Rs 3,00,000 crore of losses; every year (we are) adding Rs 60,000-70,000 crore (to this number). That’s a reality. I can’t wish it away” (Bhaskar 2014). As soon as the moratorium on principal payments had ended, another bailout was announced.

That bailout, the Ujwal DISCOM Assurance Yojana (UDAY), was launched in November 2015, with the same dual objective of restoring fiscal health and imparting incentives for reform. The UDAY budget amounts to Rs 209,000 crore. This budget supported a financial restructuring under which States would assume 75 percent of discom debts by issuing State bonds and returning the proceeds to the discoms. Aside from the total amount of debt relief, there are large subsidies built into the program through its Central backing. The new State bonds are treated as sovereign debt by investors, with corresponding low rates, but were temporarily not counted as debt when the Central Government calculated the fiscal position of the State for borrowing norms. Moreover, the smaller share of debt that remains with the distribution companies is forced under a regulated interest rate, which is only possible because discoms rely on State-sponsored financing. Regarding the bonds issued after the 2012 bailout, a banker commented, “There cannot be any default on these bonds. The RBI is responsible for the servicing of interest on these bonds. These are also
### Table 2: Aggregate Financials of Indian Discoms, 2009-10 to 2021-22

<table>
<thead>
<tr>
<th>Years</th>
<th>Gross Input Energy (MU)</th>
<th>Gross Energy Sold (MU)</th>
<th>Total Expenditure (Rs crore)</th>
<th>Total Revenue on Subsidy Received Basis (Rs crore)</th>
<th>Revenue (excl. state subsidies &amp; revenue grant under UDAY) (Rs crore)</th>
<th>Loss without subsidies and UDAY Grant revenue</th>
<th>Loss without subsidies &amp; UDAY Grant in constant 2022 (Rs crore)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009-10</td>
<td>7,04,727</td>
<td>5,22,256</td>
<td>2,49,794</td>
<td>2,06,373</td>
<td>1,87,299</td>
<td>-43,421</td>
<td>-62,495</td>
</tr>
<tr>
<td>2010-11</td>
<td>7,55,933</td>
<td>5,80,996</td>
<td>3,00,681</td>
<td>2,49,552</td>
<td>2,29,214</td>
<td>-51,129</td>
<td>-71,467</td>
</tr>
<tr>
<td>2011-12</td>
<td>8,10,653</td>
<td>6,24,954</td>
<td>3,69,272</td>
<td>2,93,329</td>
<td>2,67,558</td>
<td>-75,943</td>
<td>-1,01,714</td>
</tr>
<tr>
<td>2013-14</td>
<td>8,89,417</td>
<td>6,98,169</td>
<td>4,61,624</td>
<td>3,92,497</td>
<td>3,55,739</td>
<td>-69,127</td>
<td>-1,05,885</td>
</tr>
<tr>
<td>2014-15</td>
<td>9,67,856</td>
<td>7,53,432</td>
<td>5,03,773</td>
<td>4,47,204</td>
<td>4,01,620</td>
<td>-56,569</td>
<td>-1,02,153</td>
</tr>
<tr>
<td>2015-16</td>
<td>10,07,997</td>
<td>7,85,132</td>
<td>5,34,783</td>
<td>4,86,401</td>
<td>4,11,887</td>
<td>-48,382</td>
<td>-1,22,896</td>
</tr>
<tr>
<td>2016-17</td>
<td>10,42,428</td>
<td>8,20,244</td>
<td>5,71,477</td>
<td>5,22,035</td>
<td>4,29,263</td>
<td>-49,442</td>
<td>-1,42,214</td>
</tr>
<tr>
<td>2017-18</td>
<td>11,18,530</td>
<td>8,89,691</td>
<td>6,25,893</td>
<td>5,81,420</td>
<td>4,72,836</td>
<td>-44,473</td>
<td>-1,53,057</td>
</tr>
<tr>
<td>2018-19</td>
<td>12,24,166</td>
<td>9,90,832</td>
<td>7,35,984</td>
<td>6,77,528</td>
<td>5,60,998</td>
<td>-58,456</td>
<td>-1,74,986</td>
</tr>
<tr>
<td>2020-21</td>
<td>12,25,389</td>
<td>9,95,472</td>
<td>7,59,579</td>
<td>6,89,181</td>
<td>5,71,676</td>
<td>-70,398</td>
<td>-1,87,903</td>
</tr>
<tr>
<td>2021-22</td>
<td>13,13,864</td>
<td>10,90,052</td>
<td>8,27,847</td>
<td>8,10,879</td>
<td>6,49,153</td>
<td>-16,968</td>
<td>-1,78,694</td>
</tr>
</tbody>
</table>

Source: Calculated using PFC Report on Performance of Power Utilities (over multiple years). The data include both State and private discoms. Total Revenue includes Other Income and Revenue Grants and Regulatory Income.
ultimately State liabilities, and no Indian State government will ever default’ (Dalal 2015).

One novel element of the UDAY plan was putting in safeguards against its own failure: even future debts built up by the discoms would be assumed by the States (Ministry of Power 2015; Chitnis et al. 2018). The UDAY scheme built in a schedule whereby, from 2015-16 on to 2020-21, States would assume an increasing share of discom losses from the prior year (up to 50 percent of 2019-20 losses to be assumed in 2020-21). It also set limits on how much short-term debt banks and financial institutions, which in effect means state-owned banks, the only willing lenders, could issue to discoms in the future.

The performance objectives of UDAY were explicit and measurable and targeted to “improving operational efficiencies”. These objectives were of two kinds: what discoms must do and what targets they must achieve. The discoms were obligated to meter feeders and distribution transformers, index consumers, install smart meters for large consumers, implement a program of demand-side management to reduce consumption, and other similar measures. These measures were supposed to achieve two high-level objectives: bring ATC losses down to 15 percent by 2018-19, and reduce the gap between the Average Cost of Supply and Average Revenue Realized per unit to zero by 2018-19. Neither of these targets has been achieved or was even close to being achieved. ATC losses in 2018-19 were 23 percent across India (25 percent in States claiming UDAY funds). We review the relative performance of UDAY States in more depth in Section 3.

The bailout cycle has just begun anew. The distribution companies in 2020 received a bailout of Rs 90,000 crore in loans from Central Government bodies as part of the Government of India’s response to COVID-19 (Shankar and Avni 2021). This bailout was followed in 2021 by the Revamped Distribution Sector Scheme (RDSS), a package of Rs 3 lakh crore of investments in many of the same grid elements covered by prior efforts, including distribution network strengthening and loss reduction, the separation of distribution feeders for agricultural customers and universal metering coverage, including in the agricultural sector. This scheme has adopted some of the very same targets that were not achieved under UDAY: a reduction in ATC losses to 12-15 percent nationwide by 2024-25 and an elimination of the gap between the cost of supply and revenue by 2024-25.

The brief history of bailouts given here draws out several common themes. First, fiscal restructuring that assumes discom debt is always accompanied or followed by a large program or Central investment in distribution. Second, both of these components are planned to work together to improve “commercial orientation” and reduce losses but have not done so; progress towards loss reduction has been very slow. Third, in successive packages, one sees an increasing tendency by Central programs to reach further and further into the operations of discoms—not only should discoms build substations or
transmission lines, but they should also use central funds for metering the grid, and then for metering customers.

2.3. The Agency Problem Created by Fiscal Federalism in the Electricity Sector

The two fundamental problems in the Indian electricity sector are well-known in economics. First there is a problem of agency, in that the State distribution companies are spending money that is not their own, and therefore, spend too much. A State distribution company that expects to pay for investments, working capital, and operating losses with funds from the State government or the Centre has no incentive for fiscal discipline. The discom, therefore, makes wasteful investment decisions and under-invests in revenue collection and enforcement. This agency problem also harms customers. Since the discom does not have to supply power reliably or collect revenue to fund its operations, it has little incentive to maintain a high quality of supply or provide good customer service.

The second problem, underlying the agency problem, is one of commitment. The Central Government would like State distribution companies to improve their fiscal and operational problems. It repeatedly has set targets to reduce losses, raise tariffs, and cover the costs of supply. Yet, if these targets are not met, the Central Government renews them again with a fresh injection of funds. It cannot commit to cutting off States and their distribution companies if they do not improve, because doing so, once the discoms have dug a fiscal hole, would amount to turning out the lights. Discoms would first default on power purchase agreements, reducing procurement and power supply, and also bankrupting independent power producers. Rapidly, the state of the distribution network in rural India—built up at great Central expense—would deteriorate, and the achievement of universal electrification would be unwound. The Central Government has declared a national interest in universal electrification, and therefore committed to back those discoms that cannot meet or sustain this goal on their own.

The irony of this agency problem is that the Central Government understands perfectly well that the distribution companies are poor stewards of public investment. Every past Central intervention has attempted to impose conditions to improve discom performance. The Central Government wants to reach every Indian household with low-cost, reliable power. To do so, it must act through the States. If the same amount of money as has been spent on bailouts and public investment for State distribution companies, had been channeled through distribution companies with the low procurement costs and high operating efficiency of a private player—such as Tata Power in Delhi, for example—then the Centre would have bought more power for more households with its investment. Yet the agency problem means that the fact of Central backing weakens the incentives of State distribution companies to improve. It has not
proven possible, in the present electricity sector, both to make transfers on the scale needed to sustain electrification and to give distribution companies incentives for operational improvement. Section 3 reviews the slow progress of State discoms in recent years.

3. The Fiscal Standing of India’s State-owned Distribution Companies

The modern era in the Indian electricity sector arguably began with the passage of the Electricity Act of 2003. Some twenty years on, the fiscal health of the State distribution companies remains poor, with ongoing high losses and dependence on State government subsidies and Central Government bailouts to ensure solvency. We review the fiscal position of the State distribution companies and flag both positive and concerning trends. The best recent development is that losses, while high, have been coming down, and the subsidies between State governments and State distribution companies are being made as formal transfers upfront, rather than an accumulation of debt. The worrying case is that the operational performance in lagging States has improved only slowly, and some critical measures, such as the gap between the cost of supply and revenue, have continued to deteriorate.

**Figure 3.** State Distribution Company Revenue as a Percentage of Expenditure, by Revenue Category, 2009-10 through 2021-22

Source: Calculated using PFC Report on Performance of Power Utilities (multiple years). Other revenues include regulatory income and grant revenues other than under UDAY.
3.1. Current Fiscal Standing

State discoms incur substantial losses while selling electricity (Figure 3). In the latest data from 2021-22, the average cost of supply for State discoms was Rs 6.29 per power unit on the basis of energy input (Figure 4). However, discoms received 69 percent of their total expenditure from paying customers (operational income only, excluding any state tariff subsidy and grant), resulting in an Average Realizable Revenue (ARR) of Rs 4.35 per unit only.

**Figure 4. State Discom Supply Cost and Revenue**

Source and Note: Data from 2021-22 PFC report. Only State discoms data is included. Cost per kWh is calculated using total expenditure and total energy input. Revenue (sales + subsidy + grants) includes operational revenue (from sales only), State tariff subsidy, and all other grants and income including UDAY. Revenue (only sales) indicates operational revenue.
Primarily, with State tariff subsidies received adding Rs 1.24, the revenue goes to Rs 5.59. Once we add other income and revenue grants (including UDAY) and regulatory income, it reaches Rs 6.12. Earlier years had even larger gaps between the cost and revenue, primarily due to State subsidy received being lower than State subsidy billed by discoms. Considering only the operational income and excluding major subsidies, grants, and other cash adjustments, State discoms sold electricity at a loss of 31 percent in 2021-22, 34 percent in 2020-21, and 31 percent in 2019-20.

The liability to the generator for unpaid bills of power purchased also has been gradually increasing over time—from Rs 233,000 crore in 2019-20 to Rs 260,000 crore in 2021-22. Discoms also report large trade receivables that are primarily consumer bills pending, though they may not realize completely.

State discoms reported yearly after-tax loss of Rs 35,000 crore in 2021-22, Rs 52,000 crore in 2020-21, and Rs 33,000 crore in 2019-20. Building on these yearly losses, the total accumulated loss of State discoms has been steadily increasing—from Rs 5.12 lakh crore in 2019-20, to Rs 5.40 lakh crore in 2020-21, and Rs 5.74 lakh crore in 2021-22.

### 3.2. Sources of Discom Losses

Discom losses are often attributed to their ATC losses, though the latter does not provide a complete picture. We explain that below in the next two paragraphs followed by a description of key sources for discom losses.

Discoms in India show very poor performance in terms of ATC losses. Total power transmission and distribution losses in OECD countries have been stable at around 6 percent for a long time. In India, the transmission-related technical losses of about 6.5 percent—that are separate from the discoms’ ATC losses—alone exceed this (Devaguptapu and Tongia 2023). In contrast, ATC losses in electricity distribution alone hovered around the 20-35 percent range for a long time in India (Figure 5, Panel A). After removing the reported agricultural sales and revenue (primarily State subsidy), the ATC losses come out to be even larger and this is consistent across States (Figure 5, Panel B). Mismanagement, including theft of power, is likely one key reason behind large ATC losses in India. Two specific aspects of ATC losses are critical to understanding the fiscal situation of discoms. First, discoms do not separate the technical losses from “commercial” losses, so reported ATC loss remains a black box. Second, a large number of electricity connections remain unmetered and many times, even in the case of metered connections discoms use assumed readings. This adds uncertainty to the billing efficiency discoms report. Since ATC loss calculations are based on the calculated billing efficiency, the reported ATC loss is likely to be much lower than the actual ATC loss.

On the brighter side, discoms’ reported ATC losses have been gradually decreasing, albeit at a sluggish pace. The year 2021-22 has been an exception
Figure 5. Aggregate Technical and Commercial Losses, 2009-10 to 2021-22

Panel A. Including Subsidies as Revenue

Panel B. Excluding Subsidies from Revenue


Note: The ATC Loss for India is an average of the ATC Losses incurred across States every year. We assume that the agricultural sector accounts for 90 percent of the State subsidies (consistent with the PFC assumption) and 24 percent of units sold by discoms. In the second panel, we go on to exclude this consumption and subsidy from the total to highlight the losses in the absence of these State subsidies. 2021-22 data for three discoms (JKPDD, Torrent Power Ahmedabad, and Torrent Power Surat) is not reported in the PFC report. All four discoms in Odisha have been privatized, and renamed to TPNODL, TPSDDL, TPWDL, and TPCODL, but for the purpose of this analysis we have used the old names to be consistent with previous years.
in the sense that a substantial reduction in ATC losses is reported by discoms—from 22.25 percent in 2020-21 to 16.6 percent in 2021-22 (Figure 5, Panel A), though the revenue efficiency has hardly shown a comparable level of improvement (Figure 5, Panel B). In general, the reported ATC losses decreased from 32 percent to 17 percent during the 2009-10 to 2021-22 period, while operating revenue increased by only 3 percent during the same period—from 75 percent in 2009-10 to 78 percent in 2021-22.

To understand this inconsistency, it is critical to discuss the potential sources of non-technical losses.

First, State governments offer heavy electricity subsidies to households and farmers, but often fail to reimburse discoms regularly. We looked into data for 2020-21 (the latest year for which consumer category-wise data is available) from five States that have high agricultural energy consumption (Table A1). About one-third of all units sold are categorized under the agricultural category. Since farmers receive electricity mostly for free, the revenue collected against these sales is often insignificant. Not surprisingly, these State discoms report an operation revenue collection rate of 69 percent, which is worse than the national average. For instance, Punjab discom reports selling 26 percent of total units to farmers, against which no revenue was collected. Likewise, albeit to a smaller degree, States also offer households tariff subsidies. States and discoms do not provide a breakdown of the tariff subsidy, so we have no easy way to see their growth. However, the category-wise power sales data in PFC reports shows that agriculture power sales almost doubled and household sales increased by about 150 percent since 2009. The impact on aggregate State subsidy has been much higher—it increased about eight times in the same time period.

Discoms bill the State against this subsidized consumption. While States are required to reimburse discoms against these household and agricultural subsidies, they often fall behind. Among these five States, the agricultural sector tariff subsidy itself amounted to about Rs 84,000 crore in 2020-21 but the respective State governments provided a total subsidy of Rs 47,000 crore only. In the latest year 2021-22, discoms received exceptionally high State tariff subsidy transfer (Rs 157,000 crore against the billed Rs 144,000 crore), likely because of conditions for States laid down in UDAY, as we discuss later in Section 3.4.

Second, a significant proportion of consumers are neither billed nor do they make the payment when billed, a concern that will exacerbate with universal electrification. The reasons can vary from weak enforcement on defaulters to electricity theft following collusion between discom officials and consumers. The reported billing efficiency shows a large variation across States—73 percent in Jharkhand to 92 percent in Andhra Pradesh (PFC Report 2021-22). Even when a part of the gap between the energy input and the energy billed is due to technical losses, it is obvious that most State discoms are not able to account
for a significant part of the energy they are selling. Further, collection against recorded sales is also often lacking, though most States have improved their collection efficiency significantly over time.

Third, related to the point that a significant number of connections remain non-metered, such non-metered connections often help conceal power theft. Specifically, discoms report that about one-quarter of the energy is consumed by agriculture consumers, but since these agriculture connections are rarely metered, they allow for the scope of disguising unbilled and stolen electricity as agricultural consumption. The Saubhagya scheme increased the proportion of metered connections for households, though agricultural non-metered connections have mostly remained untouched due to various factors.

The fact that the billing efficiency of State discoms and private sector discom, as reported in PFC reports, are often comparable, is quite surprising. Private discoms hardly observe this level of losses as State discoms have. The reason is that State discoms’ “billing efficiency” also includes bills issued to the State government on account of customers that have no meters and bills, primarily, farmers and households without meters. Discoms do not provide segregation of billing efficiency across metered and non-metered connections, which could help clarify it further.

3.3. Accounting of Discom Finances

We find two aspects of discom finance reporting worth highlighting here since these have implications for how losses are calculated and reported in PFC reports. Both points make a strong case for bringing in more transparency in how State discom finances are reported.

First, discoms sell a large amount of electricity to farmers, usually to the tune of 23-24 percent of total energy input. These connections are almost always unmetered, which may allow discoms to mask losses coming from other sources by including them in agriculture consumption. We see very little effort in improving reporting of the agriculture sector, despite the fact that about 90 percent of the State tariff subsidy is usually to compensate for agricultural consumption.

Second, discoms add various unrealized revenues that are quite unlikely to realize. Regulatory income that leads to the creation of regulatory assets on discoms books for future tariff recovery. Also, excess consumer non-collection–dues that are recoverable in theory, but not in practice—is termed as “trade receivable” on discoms’ books. While we do not go into details in this paper, Devaguptapu and Tongia (2023) have rigorously mapped these sources of discom losses by adopting a cash-flow-based accounting approach in place of accrual accounting practiced by PFC.
3.4. Recent Trends in Fiscal Position and Operational Performance

We show key statistics that summarize the trend in discom finances in Figure 6. The reported ATC losses have been gradually decreasing. In the data we compiled since 2009-10, it has almost reduced to half, starting from 31 percent. Billing efficiency has also shown a consistently positive improvement over time with an improvement of roughly 1 percentage point per year, on average. Collection efficiency has also improved despite variations over time, and it now reaches close to 97 percent in the latest year data. However, a more practical view of trends in losses comes from the gap between ACS and ARR. It used to be close to Re 1 per unit in 2011-12 but has come down significantly since then. The year 2021-22 is an exceptional year when State subsidy transferred to discoms was relatively higher than in other years. However, once we exclude subsidies and grants, the ACS-ARR gap has actually increased over time—from Re 1 per unit to almost Rs 2 per unit. This contrast (between the two figures on the gap) underscores the key point that discoms have gradually become more dependent on State subsidies and grants.

Another useful approach to understanding the fiscal challenges of discoms is to compare actual operational revenue against the total expenditure. The gap between expenditure and operational revenue (including regulatory income, other revenue and grants, excluding State tariff subsidy or UDAY grant) has been massive but stable since 2009, hovering at around 25 percent (Figure 6). Taking a more rigorous approach of cash-flow-based accounting to break down discom finances, Devaguptapu and Tongia (2023) show that even these figures are inflated in the accrual-based accounting that discoms and PFC follow. As per the PFC reports on the performance of power utilities, all discoms together reported a loss of Rs 43,000 crore in 2009-10, which increased to Rs 70,000 crore in 2020-21 (Table 2). The calculation of these loss figures combines subsidies and grants to operational revenue. Once we exclude explicit State tariff subsidies and UDAY grants, the net loss increases threefold from Rs 62,000 crore to Rs 188,000 crore during the same period.

The revenue split shown in Figure 6 shows the gap between expenditure and operational revenue (inclusive of other revenue/grants and regulatory income). The revenue percentage (over total expenditure) improved marginally from 75 percent to 80 percent between 2009 and 2014, and has been mostly stable within this range in later years. The situation varies significantly across States. For example, Rajasthan improved operational revenue from the base of 46 percent to 65 percent during 2009-14, while the operational revenue of Uttar Pradesh discoms remained around 65-67 percent during the same period. The States also often over-state their success in reducing fiscal losses using non-transparent calculations ignoring State and Central support. For example, the Rajasthan discom declared a profit in 2017-18 (The Times of India 2018), while its collection when including State subsidy was only 78 percent, and 62 percent
after excluding State subsidy (Figure A1). The big difference here was solely due to grants provided to Rajasthan under UDAY. Figures A2 and A3 show a similar analysis for Tamil Nadu and Uttar Pradesh.

3.5. Relative Performance of States Drawing UDAY Funds in Recent Years

UDAY provides a useful case study to understand the impact of bail-outs on the fiscal position of discoms. In total, 18 States (49 discoms) joined UDAY and/or issued UDAY bonds, another 11 States (17 discoms) joined UDAY but did not issue UDAY bonds, while the remaining 2 States (11 discoms) did not
join UDAY. West Bengal is a special case since it did not formally join UDAY but had issued UDAY bonds in initial years. Among the two States that did not join UDAY, Delhi had already privatized its electricity distribution and Odisha did the same more recently. A list of States by their UDAY status is provided in Table A2. As per the UDAY website, UDAY bonds worth a total of Rs 232,163 crore have been issued, as of September 2023. Under UDAY, States took on 75 percent of the discom debt as of 2015 and future losses until FY22 (total Rs 197,000 crore by FY22). Discoms also received Rs 72,000 crore in grants under UDAY.

Using an event study design, we compare States that participated in the debt restructuring part of UDAY to those that did not. One would expect that these States have been subjected to specific conditions related to the fiscal management of discom finances, and so are likely to perform better. Figure 7 shows the event study results. We estimate that ATC losses are slightly higher in UDAY bond States in the first year though the difference becomes statistically insignificant after the first year. While the billing efficiency shows no difference, collection efficiency is lower in the UDAY bonds issuing States. Overall, the gap between cost and the revenue per unit power has come down more, from high levels, in States issuing UDAY bonds.

We also conduct a similar analysis after removing agricultural consumption and subsidy transferred by States to pay for it. First, the left panel in Figure 8 shows the trends, without agriculture sales and revenue. ATC losses are much higher for all States, as compared to ATC losses without agricultural subsidy, as shown in Figure 7. The billing efficiency without agriculture sales and revenue is much lower, especially when comparing UDAY bonds issuing stated without agriculture sales and revenue (64 percent) with the same States with agriculture sales and revenue (87 percent). The ACS-ARR gap reaches about 1.2 for UDAY bonds issuing States and 0.5 for States that joined UDAY but did not issue bonds. Using the event study design, we do not find any statistically significant difference in ACS-ARR gap between states issuing UDAY bonds and others (right panel in Figure 8). These graphs shown in Figure 8, when compared to graphs shown in Figure 7, highlight the point that agricultural consumption and State support make it difficult to understand the actual extent of fiscal deficits and the inefficiency of discoms.

3. The following four Union Territories are excluded in our data—Andaman and Nicobar Islands, Daman and Diu, Dadra and Nagar Haveli, and Lakshadweep.

4. We use a two-way fixed effect model to estimate the effect of State joining UDAY on discom performance. We add State and year fixed effects and cluster standard errors at the State level. Treatment is defined as the state of the discom joining UDAY (which happened in different years, 2016 and 2017).

5. In some cases, such as in the case of Tamil Nadu, the Comptroller and Auditor General Report has found that discom losses, instead of decreasing, have rather increased since UDAY (The Indian Express 2022).
On the bright side, even though UDAY does not show large immediate gains, there are definitely some unique features of UDAY that may help improve the fiscal sustainability of the discoms. A key aspect of the UDAY program is that it does not focus only on past debt like previous bailouts but also restructures future finances in a way that would potentially increase the commitment of State governments to improving discom finances. This provision requires States to take over 75 percent of the standing discom debt and 50 percent of discom losses gradually. This itself helps increase accountability since it brings losses on the book ex-ante that were earlier being cleared in subsidies and bailouts ex-post. So, even when losses gross of subsidy are about the same, more of the losses are at least being accounted for as State subsidies.

UDAY’s nudge to States to take over discoms’ losses from the discoms’ books to the State’s own book is the key driver of the enhanced financial condition of discoms in recent times. At the same time, since it is essentially a transfer of discom debt to the States, UDAY has imposed a significantly large cost to the State. Rajasthan provides a good case in point. In 2017-18, the State discom was declared to be in profit for the first time in many years. This, however, was primarily due to the UDAY grant revenue that was about 23 percent of the discom’s total expenditure (Figure A1). The 2017-18 State budget of the Rajasthan government, on the other hand, shows the true picture, with a revenue deficit of Rs 1518 crore with the effect of UDAY and Rs 13,528 crore with the effect of UDAY (Government of Rajasthan 2017-18). This additional Rs 12,000 crore revenue deficit was about 1.5 percent of the State GDP. This, however, varies from State to State. For example, Tamil Nadu discoms observe significant transfer under UDAY, while Uttar Pradesh discoms do not (Figures A2-A3).

The Government of India is also using other policy levers to force distribution companies into fiscal discipline. First, the Ministry of Power announced new rules in 2022 on imposing a late payment surcharge on distribution companies that fail to pay off their dues to generators on time. In the first one year of the policy, the outstanding dues have come down from 120,000 crore in June 2022 to 61,000 crore in July 2023 (Financial Express 2023). This is a positive outcome. Second, the Centre is allowing additional borrowing space to State governments conditional on discom performance on undertaking and sustaining reforms. Both policies are likely to increase incentives for States and discoms to expedite reforms and be less wasteful. Nonetheless, the critical factor lies in whether the Central Government can maintain the enforcement of these policies over the long haul.

3.6. Discom Losses and Quality of Service

Discoms’ fiscal losses directly affect discoms’ performance and the quality of service that citizens receive. Using data on ATC losses from the PFC
Source: PFC Reports on the Performance of Power Utilities and CAG Audit Reports.

Note: The figures on the left column show the average trends for ATC loss, billing efficiency, collection efficiency and the gap between the average cost of supply and average revenue rate, weighted by gross energy sold. There are three groups: discoms that are in a state that did not join UDAY, discoms in a state that joined UDAY but no bonds were issued, discoms in a state that issued UDAY bonds. The figures on the right column show event study plots for the same variables, using a two-way fixed effect model with state and year fixed effects. The set of discoms not in a UDAY bonds issuing states serves as the control group while the set of discoms in UDAY bond issuing states is the treated group. Treatment is defined at the state level. Event time is with respect to the year when state signed MoU to join UDAY.
**Figure 8.** Trends and Event Study Plots without Agriculture Subsidy

### Aggregate Technical and Commercial (AT&C) Losses

- States:
  - State did not join UDAY
  - State joined UDAY but did not issue bonds
  - State joined UDAY and issued bonds

### AT&C Loss in UDAY States

- Loss in UDAY states that issued bonds as compared to UDAY states that did not
- Year relative to treatment
- AT&C Loss 90% confidence interval

### Billing Efficiency (%)

- States:
  - State did not join UDAY
  - State joined UDAY but did not issue bonds
  - State joined UDAY and issued bonds

### Billing Efficiency in UDAY States

- Billing efficiency in UDAY states that issued bonds as compared to UDAY states that did not
- Year relative to treatment
- Billing Efficiency (%) 90% confidence interval
Source: PFC Reports on the Performance of Power Utilities and CAG Audit Reports.

Note: The figures in the left column of the figure show the average trends for ATC loss, billing efficiency, collection efficiency, and the gap between the average cost of supply and average revenue rate, weighted by gross energy sold. The variables are computed without the agriculture subsidy, assuming that they are 90 percent of the subsidy received by a discom. There are three groups: discoms that are in a State that did not join UDAY, discoms in a State that joined UDAY but no bonds were issued, and discoms in a State that issued UDAY bonds. The figures in the right column of the figure show event study plots for the same variables, using a two-way fixed effect model with state and year fixed effects. The set of discoms not in UDAY bonds issuing States serves as the control group while the set of discoms in UDAY bond issuing States is the treated group. Treatment is defined at the State level. Event time is with respect to the year when a State signed an MoU to join UDAY.
Performance Reports and Disruption Index from REC, Figure A4 shows that discoms with higher ATC losses are also the ones having more disruption in power supply. Except for a few discoms on the right tail of ATC losses, this holds true for discoms in general. A key cause of disruption is the failure of distribution transformers due to poor load management and maintenance. Data on DT failure rate from REC further confirms this relationship between high ATC losses and poor quality (Figure A5). Ultimately, one would expect that consumers served by discoms that observe high ATC losses are likely to receive fewer hours of power. Figure A6 confirms this. To sum up, large fiscal losses of discoms not only put pressure on State and Central Government finance but also directly hurt the main objective of providing universal and reliable electricity to all households.

The increased rural electrification may counteract any gains discoms make in terms of reducing losses. On the backdrop of underlying inefficiencies, there is little reason to not be pessimistic about the impact of increased rural electrification on the fiscal sustainability of the electricity sector. Universal electrification may increase losses in two ways. First, since most of the newly electrified households are poor and have a low ability to pay, the operational revenue per unit input is going to suffer. Due to household subsidies, State tariff subsidies have to increase significantly to compensate for them. And second, while the hope is that Saubhagya helps convert illegal and unmetered connections to metered connections, and thus, improves tracking, an expanded grid may also provide more opportunities for illegal connections, especially in the far-flung places. Such losses are eventually going to be covered by State subsidies or pile up as debt. Comparing gains in the electrification with the ratio of State subsidy and cost of power, we see that the State subsidy increased proportionally with the electrification gains in the last decade for most states, if not all (Figure A7).

4. Direct Benefit Transfers for Electricity as the Centerpiece of a Reform Program

What is to be done? The agency and commitment problems we identify in Section 2 are structural in nature. The Central Government must act through the States to expand or sustain energy access for citizens, which allows State distribution companies to persist and grow despite ongoing losses. The problem in this arrangement is not Central transfers per se, which may improve energy access and welfare, but that the transfers enable inefficiency and waste, raising costs for all citizens. The analysis in Section 3 shows that these problems have not been addressed, at their core, by any of the prior reform programs; we emphasize that in the post-UDAY period, the gaps in losses and operating performance
between States reliant on UDAY and those that are not have only widened. Yet the Central Government has made a remarkable and, at least for now, successful investment in universal electrification. The Central Government’s renewal of the reform program through RDSS shows that it will do everything it can for this investment not to depreciate. The success of universal electrification has made the Central commitment to the States arguably stronger than ever before.

Today there are two broad currents for reform in the power sector, which flow on from the recent history of reform. The first current we would call deepening Centralization: the greater involvement of the Central Government, through its investments in all segments of the power sector, in managing the operations of State distribution companies in an increasingly granular and detailed way. This current can be seen quite literally in, for example, the move from Central schemes funding only power meters on the electricity grid to funding power meters on each customer’s house. The second current we would call commitment at the margin: through regulation, policy coordination, and conditions attached to Central investments and aid, move state distribution companies towards a greater, though an incomplete, degree of commercial orientation. Full commitment would mean the Central Government committing to not financially support State distribution companies so that they would be forced to a more independent and commercial orientation. We judge that this is not possible, for either the Central Government or the respective State governments, given their stakes in electricity access. However, they can move to bring their support as fully on-the-books as possible, to sustain transfers while cutting back at the waste and loss that has been associated with such transfers to this point. We call this current of reform commitment at the margin because it seeks small (marginal) ways to incentivize discoms through regulation, institutional reforms, policy guidance and conditions on Central support.

Our reading of the recent experience in Sections 2 and 3 is that deepening Centralization has not improved operating efficiencies and cannot be expected to do so on its own. The broad prescription for distribution reforms has been recognized almost since the Electricity Act of 2003 was passed. Strengthen the role of regulators and Central coordination to raise tariffs to levels that cover costs (Wolak 2008). Bring subsidies onto the books of distribution companies and states, rather than financing discom losses ex post through bailouts (Bhattacharya and Patel 2008). Invest in metering and distribution infrastructure, not for their own sake, but to improve energy accounting and reduce technical and commercial losses, which would lower costs for all paying customers.

We will not lay out a complete reform program here. Space is short, and many recent reports have gone into more depth than is possible in this Forum. We recommend in particular Devaguptapu and Tongia (2023) on the need for tariff true-ups to cover discoms’ realized revenues and costs and a recent NITI Aayog report on distribution reforms (Prasanth et al. 2021). In the place of
a complete program, we restrict ourselves to make one narrow point: Direct Benefit Transfers for Electricity offer one of the best tools to align Government, discom, and customer interests in the sector. The following sub-sections lay out the rationale for a DBT-E program, the design of such a scheme and experience from both the DBT for LPG and from small pilots of DBT-E in two States.

4.1. Direct Benefit Transfers for Electricity Can Act as Commitment on the Margin

The idea of Direct Benefit Transfers is for government to give citizens benefits directly through financial transfers rather than in kind or via an intermediary. For example, the PM-Kisan scheme gives farmers an unconditional cash transfer up to Rs 6,000 as income support. The logistical case for such a scheme is that it may be easier to ensure that all of the money reaches the beneficiary than when giving support indirectly. Beyond the logistics, the efficiency benefit of an unconditional DBT is that the farmer, or any other beneficiary, can use the support for their own purposes. The Government does not have to judge what kind of subsidized good—from fertilizer and power to improved seeds, a drip irrigation system or a solar pump—would be the most valuable to the farmer, it just has to ensure that these inputs are available and that cash reaches the farmer, who can then decide for himself what to spend it on.

The idea of Direct Benefit Transfers is very powerful and well-suited to the problems of the electricity sector. A DBT for electricity would re-orient the entire distribution segment towards better-serving electricity customers, including crores of households connected under Saubhagya. DBT-E, in particular, addresses the following:

- **Do benefits reach the beneficiary?** An ongoing concern with distribution company accounting is that it is impossible to say for sure what share of subsidized electricity benefits actually reach consumers. Most agricultural consumers are unmetered. Many domestic households do not have meters read reliably or accurately. The power reaching consumers may be far less than what distribution companies claim. In this case, the State governments are paying a sum of subsidies, which bring down apparent technical and commercial losses. Yet it may serve to cover distribution company losses. Under DBT-E, this concern would be eliminated by subsidies being paid directly to Aadhaar-linked accounts.

- **Who does the distribution company serve?** The risk of backsliding on universal electrification comes from the discom not depending on its customers for revenue. Even if losses are high and electricity supply is irregular, the discom may still be able to recover its losses by billing the State government, or by accumulating debt. This removes the natural check on the quality of service provided by customers not buying a product that is badly made or sold at a high price. Under DBT, consumers with
subsidy support would choose to purchase electricity from the discom. If supply was interrupted, for example, they could still receive the DBT, but would buy less power, and discom revenues would decline. The DBT routed via the customer, therefore, moves the risk for non-performance from the customer—who cannot control the reliability of supply—to the discom, which ought to run that risk, because it runs the grid.

- **What is the commitment of the Central Government or the State to electrification?** The objective of the Central Government and the States is to increase energy access. To this point, that objective has committed the respective governments to a more-or-less open-ended support of distribution companies. If the support of government instead flowed through electricity customers, the boundary of this support would be explicit: the government would support the customer to purchase a certain amount of electricity, defined at the beginning, and the responsibility of the discom is to serve that customer to recover its revenue.

- **Is subsidized electricity put to good use?** A main concern with subsidizing any good is that it leads to waste. If I do not bear the cost of a good I do not seek to economize on its use. In the extreme, if electricity is free, a farmer may let their pump keep running, even after a paddy field is flooding over, raising electricity costs and draining groundwater at the same time. A DBT-E, depending on how it is designed and whether the subsidy support depends on electricity use, can improve the incentives for conserving electricity by setting a subsidy that does not increase with further electricity use.

The pre-requisites for a mass-scale DBT-E are either in place or in plan. One of the main accomplishments of the last decade, and of the UDAY scheme, in particular, has been to move more support for discoms from ex-post bailouts to ex-ante subsidy transfers (Section 3). This step financially prepares the States to then re-assign the recipient of the subsidies to be customers, rather than discoms themselves. The Government of India, via the Unique ID Authority of India, has successfully launched Aadhaar, the world’s largest biometric identification system, and used Aadhaar to link benefit transfers for schemes such as the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) and the Direct Benefit Transfer for LPG (DBT-L). The same could be done for electricity. The main snag for the confirmation of the receipt of benefits in the electricity sector is that the state of electricity metering for subsidized customers, especially in agriculture, is poor. The -RDSS)- plans to change this with a massive investment in universal smart metering by 2025-26.

In the sub-sections below, we briefly introduce a design for a DBT for electricity scheme. This design is meant to be a model; the actual terms and details of such a scheme will depend on the existing tariff and subsidy structures in a state, and therefore cannot be written down in general for all. We
then discuss the experience with pilots of DBT-E for agricultural consumers in Rajasthan and Punjab.

4.2. Design of a Direct Benefit Transfer for Electricity Scheme

The design principles of a basic DBT-E are given in Table 3. Consumers are entitled to a fixed number of discounted units of electricity. The subsidy value of this entitlement is transferred to the consumer at the time a bill is issued. The consumer is then billed at the full tariff rate. Under a DBT-E, the consumers are allocated a lump-sum subsidy entitlement and in return charged the full tariff rate for units consumed. Table 4 illustrates how DBT-E could work, for a domestic consumer (in Panel A) and an agricultural consumer (Panel B). The numbers in each example are chosen to be broadly realistic, but of course, the parameters of the scheme would vary from State to State, depending on the pre-existing subsidy structure and other factors.

<table>
<thead>
<tr>
<th>Design</th>
<th>Principle</th>
<th>Variant for domestic consumers</th>
<th>Variant for agricultural consumers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Entitlements</td>
<td>Consumers are entitled to a fixed number of discounted units of electricity.</td>
<td>Number of units and per unit subsidy may be dictated by structure of pre-existing tariff.</td>
<td>Number of units based on average consumption or the hours of free power under feeder rationing.</td>
</tr>
<tr>
<td>Transfers</td>
<td>State government transfers the value of entitlement to the consumer at the time a bill is issued.</td>
<td>Bill may be issued only for the net amount owed after deduction of subsidy.</td>
<td>No bill need be issued for exceeding the entitlement if supply is rationed.</td>
</tr>
<tr>
<td>Billing</td>
<td>Consumer is billed at the full tariff rate.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Consider the case of a domestic consumer in Panel A. Suppose the cost of supply is Rs 6 per kWh and the subsidy is Rs 4 per kWh on the first 200 kWh only, which is a simple kind of increasing block tariff where the subsidy applies to the first slab of units. The value of the subsidy entitlement is then Rs 800. A consumer who uses only 100 kWh (Column 1) spends less on power than they are entitled to. This consumer would earn a DBT refund of Rs 200, deposited in their bank account, for the gap between the entitlement and their expenditure on power. Any bill less than the subsidy entitlement would earn the consumer a refund. If consumption were higher, as in Columns 2 or 3, the consumer would not receive a refund, but would have their bill net or subsidy reduced by the subsidy entitlement. However, the marginal charge for additional units...
would remain at Rs 6 per kWh. In this example, the value of the entitlement is calculated on the basis of the existing tariff. On consumption above the lump-sum subsidy, the consumers pay at the full tariff rate.

### Table 4. Illustration of Direct Benefit Transfers for Electricity

#### Panel A. Domestic Consumer Example

<table>
<thead>
<tr>
<th>Line items</th>
<th>Consumption scenarios</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
</tr>
<tr>
<td>(i) Consumption (in kWh/month)</td>
<td>100</td>
</tr>
<tr>
<td>(ii) Cost of supply (@ Rs 6/kWh) ((= 6*i))</td>
<td>600</td>
</tr>
<tr>
<td>(iii) Tariff (@ Rs 6/kWh) ((= 6*(i)))</td>
<td>600</td>
</tr>
<tr>
<td>(iv) Bill to customer (in Rs)</td>
<td>600</td>
</tr>
<tr>
<td>(v) Subsidy value (@ Rs 4 for first 200 kWh)</td>
<td>800</td>
</tr>
<tr>
<td>(vi) = (iv) - (v) Bill net of subsidy (Rs/month)</td>
<td>-200</td>
</tr>
<tr>
<td>(vii) = max{0, -(vi)} DBT to customer net of power bill (Rs/month)</td>
<td>200</td>
</tr>
</tbody>
</table>

#### Panel B. Agricultural Consumer Example

<table>
<thead>
<tr>
<th>Line items</th>
<th>Consumption scenarios</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
</tr>
<tr>
<td>(i) Consumption (in hours/day)</td>
<td>3</td>
</tr>
<tr>
<td>(ii) = (i)<em>5HP</em>30*0.7457 Consumption (in kWh/month)</td>
<td>335.6</td>
</tr>
<tr>
<td>(iii) = 6*(ii) Cost of supply (@ Rs 6/kWh)</td>
<td>2013.4</td>
</tr>
<tr>
<td>(iv) = 6*(iii) Tariff (@ Rs 6/hour)</td>
<td>2013.4</td>
</tr>
<tr>
<td>(v) Subsidy value (@ Rs 6 up to 9 hours)</td>
<td>6040.2</td>
</tr>
<tr>
<td>(vi) = (iv) - (v) Net bill to customer (in Rs/month)</td>
<td>-4026.8</td>
</tr>
<tr>
<td>(vii) = max{0, -(vi)} DBT to customer net of consumption charges (Rs/month)</td>
<td>4026.8</td>
</tr>
</tbody>
</table>

Source: Authors’ own calculation.
Note: Assuming pumpset capacity of 5HP for agricultural consumer.

Panel B shows the case for an agricultural consumer with a 5 HP pump. Here we assume that the State supplies up to nine hours of agricultural power and that the subsidy entitlement is calculated, generously, as the farmer using the full nine hours of power. The status quo is that the subsidy is the entire cost of power supply, here Rs 6 per kWh, which adds up to just over Rs 6,000 per month, the size of the PM-Kisan scheme transfer (Column 3). If the farmer does use the full nine hours of power, then, their tariff would equal the cost of supply and the subsidy value (Column 3). The subsidy covers the full value of consumption. If the farmer chooses to use less than the full entitlement, for example, cutting
back to six hours (as in Column 2), then the cost of supply and tariff would come down. The consumer is paid the difference between the entitlement and the tariff, which amounts to Rs 2,013 per month. Since the consumer—here, the farmer—has the chance to be paid for each unit conserved, they have an incentive to reduce consumption even though they do not face a positive bill. The consumer has, in a sense, a negative bill (transfer) that could be larger or smaller depending on their consumption. This is a key feature that allows DBT-E to be introduced in agriculture without upsetting the expectations of consumers who have long been accustomed to free power.

There are several variants on the basic design. Not all these variants are equally efficient. The two most important variations are whether the subsidy is: (i) *conditional*: the subsidy entitlement is either a fixed amount or conditioned on consumption, or (ii) *refundable*: the subsidy is only payable against bills or is refundable to the consumer. The two examples above are both unconditional and refundable DBT-E programs. In an unconditional DBT, the subsidy is fixed as a lump-sum amount regardless of the consumption of power. For example, the consumer is entitled to 200 kWh even if the household uses 400 kWh, rather than having a per unit subsidy which increases with consumption. This is equivalent to an increasing block tariff, already commonly used in India, in which the subsidy is reduced or removed on higher slabs of consumption. In a conditional DBT, the amount of subsidy would depend on consumption. For example, the consumer in Panel A, Column 1 would not receive the full amount of subsidy, since their total bill was less than the entitlement; instead, they would get a bill of zero, but no transfer or refund. In a refundable DBT, the fixed lump-sum amount may also be returned, in part, to the consumer, if they use less than the entitlement. For example, the consumer is entitled to 200 kWh even if the household uses only 100 kWh, as in Panel A, Column 1.

The most economically efficient DBT scheme, providing the strongest incentives for conservation, is one where the subsidy is unconditional and refundable. Consumers then have the strongest incentive to conserve because they can always reduce their bill to increase their refund. A risk is that such a scheme would involve committing to power subsidies even for consumers who do not use much power; however, that is the choice of the consumer, and the State Electricity Regulatory Commissions can set the level of subsidy entitlement so that it is revenue-neutral for the distribution company. A lump-sum entitlement simply replaces current expenditure on per unit electricity subsidies. This form of tariff structure also helps governments decrease the subsidy burden through better targeting of beneficiaries. This is because the subsidy is implemented using a lump-sum entitlement, which is equivalent to granting the entire subsidy on the first block of consumption units, rather than also subsidizing higher slabs. The appropriate choice of subsidy structure will be subject to the approval of the SERCs, as are subsidies for current tariffs.
4.3. Experience with Direct Benefit Transfers in India

There has been substantial experience with Direct Benefit Transfers in India. Muralidharan et al. (2022) discuss in detail the implementation of biometric authentication and DBT reforms in India. We review relevant experience for the electricity sector, from the DBT scheme for LPG and from small-scale pilots for DBT in electricity itself.

4.3.1. Comparison with Direct Benefit Transfers for LPG (DBT-L)

Direct Benefit Transfer for LPG (DBT-L), also known as the PAHAL (Pratyaksh Hanstantrit Labh) scheme, is the largest DBT scheme in the energy sector in India to date. Under DBT-L, some 30 crore households moved from a system in which subsidies were included in the over-the-counter price to a system in which households purchase LPG cylinders at market price and receive a subsidy transfer in their bank account to offset this expense. Since 2013, when the scheme was first piloted, to December 2022, Rs 147,000 crore in subsidies have been transferred to LPG consumers.

The LPG subsidy reforms were implemented over a decade in three phases following the roadmap in the Nilekani committee report (Nilekani 2011). Phase 1 was to cap LPG cylinders for universal LPG subsidies, which was done in 2012-13. Phase 2 proposed using Aadhaar and bank accounts to decouple subsidies from distribution and provide them directly to households (DBT-L/PAHAL implemented in 2013-15). DBT-L was first rolled out in 2013, but was soon terminated. A modified version of DBT-L, known as PAHAL, was implemented in 2014-15. Phase 3 outlined the broad objective of targeting the LPG subsidy to poor households, which was implemented with the Ujjawala scheme, ‘Give it Up’, exclusion of high-income households, and ultimately by restricting subsidies only to poor households (targeted on the basis of BPL status and the Socio-economic and Caste Census (SECC)). When this reform program was started, the LPG distribution sector in India was grappling with challenges similar to that of the current electricity sector, with total subsidy outlays, driven by market prices, reaching Rs 50,000 crore in 2013-14. DBT-L has led a turnaround that relieved the fiscal burden of the LPG sector on the Central Government to a great extent, if not completely.

The introduction of DBT-L has raised the portion of LPG subsidy expenditures that are actually reaching beneficiary households. Before DBT-L, household LPG cylinders were highly susceptible to being diverted to commercial users through a black market. The DBT-L scheme reduced LPG purchases by household accounts by about 20 percent. A significant part of this apparent reduction is due to a reduction in the diversion of LPG cylinders to black markets, as confirmed by the associated impact on the commercial LPG sales and black-market prices (Barnwal 2023).

The core idea of DBT, decoupling a subsidy from the distribution of a good, is equally applicable to LPG and electricity. In the LPG case, distributors had
little incentive to monitor and enforce rules when they were able to make additional profit through diversion. In the electricity case also, the distribution companies have little incentive to bill and collect revenue from customers when they expect the government to pay for any losses through subsidies and bailouts. In electricity, as in LPG, the introduction of DBT could reduce technical losses and theft that are, in the present accounting system, mis-attributed to agricultural consumption. The connected nature of the electricity grid could, in theory, limit the scope of diversion. However, energy accounting has remained incomplete despite decades of effort, so that it remains impossible to reliably demarcate legitimate consumption by subsidized categories, particularly agriculture, from power that is stolen or lost for technical reasons. DBT-E would remove the discoms’ incentive to obfuscate what is consumption and what is loss.

While the basic design of the DBT-L scheme is transferable to the electricity sector, some elements differ from what we have proposed, particularly on the conditionality of the subsidy and the structure of the sector. First, on conditionality, we propose an unconditional electricity subsidy that can be drawn regardless of consumption. This flat subsidy would be progressive and create the strongest political buy-in from customers and the strongest incentives to conserve, but contrasts with the conditional model adopted for LPG, where the purchase of LPG is necessary to receive the subsidy. Second, the institutional structures of LPG and electricity distribution are radically different. The three Central Government Public Sector Undertakings (PSUs), Indian Oil, Bharat Petroleum and Hindustan Petroleum, distribute all LPG in India, whereas some power utilities, largely state-owned, distribute electricity.

The decentralized structure of distribution means that the roll-out of DBT-E would surely be slower and more variegated than the roll-out of DBT-L was. It also means that the States would have to be urged and incentivized to adopt DBT-E. We note three channels that the Government of India has available to urge such adoption:

1. **RDSS conditions.** The RDSS is funding smart meters for many customers in India, capable of remote meter reading and disconnection of customers. The data from such smart meter readings would become the basis of consumption measurement for any DBT-E program. It is, therefore,
sensible that the RDSS terms should require, in order for discoms to receive Central funding towards smart meter installation, that States should adopt DBT at the same time for those subsidized consumers who are getting meters. Now is the time to impose this condition; the RDSS has sanctioned some 9.4 crore smart meter installations, but only 26,800 have been installed as of April 2023.

2. **Borrowing norms.** The Central Government can give financial incentives for States to adopt DBT-E. A proper DBT-E system would make the states’ balance sheets more transparent and reduce risks of state debt, possibly lowering interest rates. The Centre could augment these market benefits of DBT-E by relaxing borrowing norms for States that adopt DBT-E for subsidized consumer categories. In fact, the Ministry of Finance, Government of India, took a step in this direction by allowing a relaxation of borrowing limit equal to 0.15 percent of GSDP for States that adopted DBT-E for farmers in one district by 31 December 2020. As this offer came in the midst of a crisis and with little technical preparation, we expect that the States did not have much opportunity to respond. However, such an offer could be renewed or expanded along with technical support to design and implement DBT-E.

3. **Central support for subsidies.** The Central Government has historically supported electrification through investments and through ex-post bailouts, which relieve discom liabilities built up in part through unpaid State subsidies. A State may reasonably expect that it is cheaper to fund subsidies in this way than via ex-ante budget allocations, to which the Centre would not contribute. The Centre may counteract this expectation by offering to fund contributions to agricultural and domestic subsidies, for a certain period of time and to a greater extent for special category States—but only if those subsidies are delivered via DBT. This offer would give States an enormous incentive to move subsidy delivery to DBT.

4.3.2. **Pilot Experience in Rajasthan and Punjab**

There has been some positive experience experimenting with DBT-E for agricultural consumers in India. DBT-E has an especially powerful rationale in the agriculture sector, which is that incentivizing farmers to conserve would save not only power but also groundwater, which has no price but is a scarce, valuable resource. The existing system of limiting water use by rationing power supply does not lead to efficient use of groundwater by farmers (Ryan and Sudarshan 2022). DBT-E could in principle improve the use of water by reducing waste and encouraging farmers to switch to less thirsty crops or adopt water-saving technologies.
The States of Rajasthan and Punjab have run pilot programs for DBT-E among a group of selected agricultural consumers. Co-author Nicholas Ryan, along with Anant Sudarshan of Warwick University, has been involved in the design and evaluation of these pilots. The pilot designs are tailored to the conditions in each State. In both States, power is heavily subsidized for agricultural use. In Punjab, power is completely free, and farmers are unmetered. In Rajasthan, while the tariff net of subsidy per unit is nominal (Rs 0.9 per kWh during the period of study), farmers did have meters installed and were accustomed to receiving bills. Table 5 summarizes the terms of each scheme.

**Table 5. Direct Benefit Transfers for Electricity Pilots in Rajasthan and Punjab**

<table>
<thead>
<tr>
<th>Design point</th>
<th>Rajasthan</th>
<th>Punjab</th>
</tr>
</thead>
<tbody>
<tr>
<td>Status quo</td>
<td>Meters installed, nominal energy charges net of subsidy (Rs 0.9 per kWh). Ration of 6 hours power.</td>
<td>No meters installed, free power. Ration of 9 hours power available to agricultural feeders.</td>
</tr>
<tr>
<td>Entitlement calculation</td>
<td>Entitlement based on average usage within each sub-division for agricultural users of the same pump capacity</td>
<td>Entitlement based on average of feeder-level specific energy consumption (kWh/HP), scaled by pump capacity</td>
</tr>
<tr>
<td>Subsidy payment refundable?</td>
<td>Yes, refundable at Rs 3.85 per kWh rate of subsidy for each unit saved below entitlement</td>
<td>Yes, refundable at Rs 4 per kWh rate of subsidy for each unit saved below entitlement</td>
</tr>
<tr>
<td>Bills issued above entitlement?</td>
<td>Yes, bills issued for consumption above entitlement, as in status quo.</td>
<td>No. No bills issued for consumption beyond entitlement.</td>
</tr>
<tr>
<td>Scope of pilot</td>
<td>Farmers in 3 feeders in Bundi district eligible to enroll on voluntary basis</td>
<td>Farmers in select 250 feeders in 11 districts eligible to enroll on voluntary basis</td>
</tr>
<tr>
<td>Duration of pilot</td>
<td>September 2017 - March 2020</td>
<td>June 2019 – present</td>
</tr>
</tbody>
</table>

Source: Based on the pilot studies on DBT-E conducted by Ryan and Sudarshan.

The pilots are in two States under both fiscal and environmental strain from agricultural power subsidies. While the scale of the pilots has been modest, and the evaluation of the pilot in Punjab is ongoing, several encouraging results have emerged.

- **Farmer acceptance.** In both States, metering and enrollment were entirely voluntary. Nonetheless, farmers signed up voluntarily to get metered and have the possibility of benefits. In Rajasthan, 96 percent of farmers who enrolled say they would recommend the scheme to others, and in Punjab, 89 percent of farmers said the same.
• **Reductions in consumption.** In Rajasthan, farmers who enrolled in DBT-E reduced their consumption by 37 percent after enrollment, relative to farmers in the same area that remained on the original tariff. In Punjab, farmers who enrolled in DBT-E had 9 percent lower consumption than the average energy consumption of farmers in their feeders. These comparisons may be influenced by farmers with lower planned consumption choosing to enroll; however, the data from Rajasthan especially suggest that DBT-E encourages the conservation of power.

• **Budget-neutral or budget-improving for State.** The parameters in the pilots were set such that the per unit payment to agricultural consumers (around Rs 4 per kWh) were somewhat lower than the cost of supply. Budget calculations, therefore, show modest budget savings from the schemes at a pilot scale, because reductions in consumption create more savings on energy procurement than they cost in payouts to farmers.

In short, the pilots, though both voluntary and on a small scale, show the DBT-E scheme making good on the basic promise of its design. Farmers who enroll conserve power. Subsidy payouts are based on fixed entitlements, net of consumption as recorded by electricity meters for each farmer. Both the farmer and the government can come out ahead, in a rare policy win-win, since the farmers conserve.

The next step is for a State to lead by scaling these programs and making enrollment either mandatory or at least opt-out, so that it is assumed farmers would enroll unless they choose otherwise. Farmers would have nothing to lose, and much to gain; nothing to lose, because under the designs here farmers would generally see bills either stay the same or fall (if consumption was reduced), or would see no bills at all, as in Punjab, if exceeding the entitlement is not charged; much to gain because a scaled-up program offers the prospect not just of payouts for DBT-E but also environmental gains from large-scale conservation of groundwater resources.

### 4.4. The Place of Direct Benefit Transfers as the Centerpiece of a Reform Program

We have highlighted the benefits DBT can have as a structural reform. By separating support to the customer from support for the discoms, DBT can incentivize customers to use power more judiciously and discoms to provide quality power rather than relying on subsidies for their sustenance. We do not claim that DBT alone is enough to remedy the fiscal and operational condition of India’s distribution companies, only that it should be the centerpiece of a broader reform program.

One criticism of this proposal is that the introduction of DBT is hopeless because the problem with distribution companies is that they are political, not commercial entities, and no technocratic reform can hope to improve their
operations. Past reform programs have included investments in distribution and targets for loss reduction and had little benefit in reduced losses or operating costs. Therefore, in the end, only privatization would be a credible way to commit discoms to commercial operation and improvements in efficiency.

We think the “privatization or bust” interpretation of recent discom history is misguided and under-states the transformative role DBT-E could have in the sector. For most distribution companies, privatization in their current state is impossible. The status quo is made up of high technical losses, many non-paying or partially paying customers, and a weak state of infrastructure. Distribution companies in special category States, which might seem to benefit the most from privatization, are uniformly under-performing. The Government of India went through several attempted sales of Air India—which had numerous valuable assets—on ever better terms, before finding a buyer (in the Tata Group). Similarly, the Central Government has currently paused the privatization of Bharat Petroleum Corporation Limited midway because of limited interest by potential buyers, primarily due to concerns about fuel subsidies and price control. The asset value of a distribution company is not portable and depends heavily on the future regulatory decisions that would be made by State Electricity Regulatory Commissions (SERCs). A major risk is that SERCs, under pressure from State governments, would not adequately enforce that States compensate a private discom for any subsidized supply. It is unlikely, in the face of this risk, that any private buyer could be found for most Indian discoms.

DBT-E itself can help strengthen the commercial orientation of discoms by imposing some of the discipline of privatization even as they remain publicly-owned. DBT achieves this by separating support for customers from the financials of distribution companies. In the case of a full, unconditional DBT-E, subsidized customers receiving DBT-E would become, from the point of view of the discom, regular commercial customers, whom discoms would have to bill and collect from. The record of transfers created by DBT would increase the transparency of discom energy accounting and make it difficult to conceal technical or commercial losses as phantom supply to subsidized customer categories.

Privatization may be a useful policy option in some States and some cases. Around the world, the track record of private versus publicly-owned utilities has been mixed. Tata Power Delhi Distribution Limited, a private discom that serves a Unique Territory, in the national capital, is among the most efficient discoms when judged by low levels of technical and commercial power losses. However, before any such policy choice is even possible, discoms need the kind of fiscal discipline and transparency that DBT can provide. DBT acts precisely to separate the government function of discoms—supporting domestic and agricultural customers—from the commercial function of discoms. Only after this separation happens can privatization be contemplated.
Another—nearly opposite—criticism of DBT-E is that it is not narrow and technocratic, but too ambitious. DBT-E is politically infeasible and therefore, cannot be the starting point for reform. The correct thrust of this criticism is that DBT-E would make transparent the fact that most of the benefits of the current subsidy regime flow to large power consumers—households with many appliances, or large landholders pumping water from deep tubewells. A DBT-E needs to be tailored on a case-by-case basis to ensure that the subsidy entitlements calculated can compensate the large majority of subsidized consumers for any increase in the unit rate of electricity. If it does not compensate those who benefit from current subsidies, it cannot get off the ground politically.

The examples we discuss in Section 4.3 show that this tailoring is possible, so that State governments can satisfy farmers with DBT-E as a replacement for the current subsidy delivery mode. In practice, different States will proceed with the adoption of DBT-E at different paces for different customer groups. Many States already have so-called increasing block tariffs for domestic customers that offer subsidies for the first slab of consumption, such as free power for 100 or 200 units, with higher prices beyond. In these cases, it is simple to convert the value of energy subsidies into an equivalent subsidy entitlement to ensure that customers, particularly with lower consumption, benefit from the DBT-E transition.

5. Conclusion

Universal electrification is a historic achievement in the development of any country. India has reached it, perhaps surprisingly, without the State distribution companies that provide electricity first reaching a state of fiscal health themselves.

The main lesson of Central intervention in the power distribution sector in the last twenty years is that funds for investment and debt restructuring provide no effective incentive for distribution companies to adopt a more commercial orientation. We have observed some of the results first-hand. In one State, we sought data from a discom on energy supplied at the distribution transformer level. The transformers had all been metered with funds provided under RAPDRP. Nonetheless, the data did not exist. Since the discom did not keep detailed energy accounts, there was no need to maintain the meters, and the modems were no longer transmitting data. In another State, before the start of the Saubhagya drive, we toured non-electrified villages and found disused electricity poles, cast solidly in concrete, from prior efforts to electrify the same places. Residents said that the village had been electrified, but when the power supply dwindled and stopped, the wires and transformers were stripped and sold off. The major risk to the sector at this point in time is, therefore, whether
State distribution companies can sustain the accomplishment of electrification that they achieved through Central support. Gaps between costs of service and revenue from customers remain large. Operationally, technical and commercial losses are still well above international norms, and it is likely that even these losses are under-stated. Since energy accounting remains incomplete, some part of the reduction in ATC losses in recent years may be due to lost power being booked as agricultural consumption. A bright spot in the recent data is that State support to distribution companies, while it has grown, has also grown more visible. State Electricity Regulatory Commissions, in pursuit of national guidance, have moved tariffs to better cover costs ex-ante, and the rules of the UDAY scheme have pushed States to bring subsidies onto their books in advance rather than to bail out discoms for accumulated losses ex-post. The transparency of subsidies is a sign of progress, though on its own will not necessarily reduce waste or reduce costs. It is rather a tool to enable further work toward those efficiency goals.

We advocate using this window for the Centre and States to make a coordinated push for DBT-E across the sector for both domestic and agricultural consumers. Technical upgrades alone have not, in the past, and will not now impart a commercial orientation. DBT-E is different, since it changes the structure of incentives in the sector altogether: in a system where subsidies flow from government to customers, discoms have to serve customers—not the government—to collect revenue, invest, and grow. It has long been assumed that the agricultural power subsidy is politically untouchable. However, that was in an era when the assumption was that “reform” meant simply to raise tariffs, whereas DBT-E would instead convert subsidies from per unit subsidies to refundable transfers. Our experience working with pilots in Rajasthan and Punjab shows that the DBT-E concept is viable at a small scale. What remains is for the idea to reach the masses.

DBT-E would surely be only one part of a larger reform agenda. We emphasize this part as a leading example of commitment at the margin: the adoption of reforms and policies that tend to increase discom independence, the goal of commercial orientation that has eluded past reform efforts. There are surely many other parts of the reform agenda that can also help build such commitment, especially in the State Electricity Regulatory Commissions continuing to impose discipline on tariff-setting, tariff true-ups, and energy accounting. These steps would help ensure that the landmark achievement of universal electrification is followed by continued improvements in power supply and reductions in costs in the years to come.
References


Muralidharan, Karthik, Paul Niehaus, and Sandip Sukhtankar. 2022. “Integrating Biometric Authentication in India’s Welfare Programs: Lessons from a Decade of


To view the entire video of this IPF session and the General Discussion that ended the session, please scan this QR code or use the following URL
https://youtu.be/1iMIQveOeYc
Annexure

**Figure A1.** Revenue Split by Operational, UDAY Grant Revenue and State Subsidies for Rajasthan

![Graph showing revenue split by Operational, UDAY Grant Revenue and State Subsidies for Rajasthan]

Source: Calculated using PFC Report on Performance of Power Utilities (over multiple years). Other revenues include regulatory income and grant revenues other than under UDAY.

**Figure A2.** Revenue as a Percentage of Expenditure for Tamil Nadu

![Graph showing revenue as a percentage of expenditure for Tamil Nadu]

Source: Calculated using PFC Report on Performance of Power Utilities (over multiple years). Other revenues include regulatory income and grant revenues other than under UDAY.
FIGURE A3. Revenue as a Percentage of Expenditure for Uttar Pradesh

<table>
<thead>
<tr>
<th>Year</th>
<th>Operational Income</th>
<th>Regulatory Income and Other Revenue &amp; Grants</th>
<th>Tariff Subsidies Received</th>
<th>UDAY Grant Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009-10</td>
<td>64.9</td>
<td>73.1</td>
<td>58.3</td>
<td>58.7</td>
</tr>
<tr>
<td>2010-11</td>
<td>9.0</td>
<td>0.0</td>
<td>11.7</td>
<td>13.4</td>
</tr>
<tr>
<td>2011-12</td>
<td>13.4</td>
<td>10.9</td>
<td>0.0</td>
<td>10.1</td>
</tr>
<tr>
<td>2012-13</td>
<td>58.7</td>
<td>53.7</td>
<td>0.0</td>
<td>2012</td>
</tr>
<tr>
<td>2013-14</td>
<td>67.3</td>
<td>72.5</td>
<td>0.0</td>
<td>12.4</td>
</tr>
<tr>
<td>2014-15</td>
<td>77.9</td>
<td>77.0</td>
<td>73.1</td>
<td>11.7</td>
</tr>
<tr>
<td>2015-16</td>
<td>71.4</td>
<td>76.1</td>
<td>71.4</td>
<td>4.7</td>
</tr>
<tr>
<td>2016-17</td>
<td>66.6</td>
<td>71.4</td>
<td>66.6</td>
<td>4.5</td>
</tr>
<tr>
<td>2017-18</td>
<td>14.3</td>
<td>13.8</td>
<td>14.3</td>
<td>5.8</td>
</tr>
<tr>
<td>2018-19</td>
<td>16.4</td>
<td>9.6</td>
<td>16.4</td>
<td>9.9</td>
</tr>
<tr>
<td>2019-20</td>
<td>18.2</td>
<td>14.3</td>
<td>18.2</td>
<td>10.8</td>
</tr>
<tr>
<td>2020-21</td>
<td>11.7</td>
<td>9.3</td>
<td>11.7</td>
<td>8.9</td>
</tr>
<tr>
<td>2021-22</td>
<td>10.9</td>
<td>9.0</td>
<td>10.9</td>
<td>9.0</td>
</tr>
</tbody>
</table>

Source: Calculated using PFC Report on Performance of Power Utilities (over multiple years). Other revenues include regulatory income and grant revenues other than under UDAY.

FIGURE A4. ATC Loss versus Disruption Index

Source: ATC Losses from the PFC Performance Reports and Disruption Index from REC (CSRD Report, 2020-21).
Note: The Gujarat DISCOM PGVCL was dropped from this graph because of an unusually high interruption index which was skewing the graph.
**Figure A5.** ATC Loss versus DT Failure Rate (%)

**Figure A6.** ATC Loss versus Hours of Rural Supply

Source: ATC Losses from the PFC Performance Reports and DT Failure Rate from REC (CSRD Report, 2020-21).
FIGURE A7. Change in Household Electrification % versus change in Subsidy Booked (% of Power Purchasing Cost) between 2020 and 2011

Source and Note: 2011 CENSUS and NFHS-5 (2021) for household electrification and PFC Performance Reports for Subsidy Booked. Because Telangana was a part of Andhra Pradesh in 2011, for the purpose of this graph, we have combined it with Andhra Pradesh in 2020 and the electrification percentage is an average of the two States.
### Table A1. Revenue Breakdown for States with High Agricultural Electricity Consumption (2020-21)

<table>
<thead>
<tr>
<th>State</th>
<th>Punjab</th>
<th>Rajasthan</th>
<th>Maharashtra</th>
<th>Karnataka</th>
<th>Haryana</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gross Energy Sold (MU) (A)</td>
<td>49,729</td>
<td>66,464</td>
<td>1,05,484</td>
<td>54,783</td>
<td>43,165</td>
</tr>
<tr>
<td>Domestic</td>
<td>15,322</td>
<td>13,399</td>
<td>21,413</td>
<td>13,871</td>
<td>11,974</td>
</tr>
<tr>
<td>Agricultural</td>
<td>13,049</td>
<td>28,506</td>
<td>33,913</td>
<td>21,091</td>
<td>10,006</td>
</tr>
<tr>
<td>Commercial</td>
<td>3,282</td>
<td>3,855</td>
<td>4,831</td>
<td>4,974</td>
<td>4,006</td>
</tr>
<tr>
<td>Industrial</td>
<td>16,425</td>
<td>13,339</td>
<td>38,090</td>
<td>8,382</td>
<td>12,665</td>
</tr>
<tr>
<td>Others</td>
<td>1,651</td>
<td>7,364</td>
<td>7,236</td>
<td>6,464</td>
<td>4,515</td>
</tr>
<tr>
<td>Total Expenses (B)</td>
<td>32,837</td>
<td>58,071</td>
<td>87,023</td>
<td>46,273</td>
<td>28,038</td>
</tr>
<tr>
<td>Total Revenue (incl. subsidy &amp; UDAY) (C)</td>
<td>32,885</td>
<td>52,076</td>
<td>83,989</td>
<td>41,100</td>
<td>28,675</td>
</tr>
<tr>
<td>Operational Revenue</td>
<td>20,714</td>
<td>34,836</td>
<td>67,077</td>
<td>28,143</td>
<td>22,208</td>
</tr>
<tr>
<td>Subsidy Received (D)</td>
<td>9,657</td>
<td>12,767</td>
<td>8,185</td>
<td>11,148</td>
<td>5,566</td>
</tr>
<tr>
<td>Regulatory Income</td>
<td>-</td>
<td>-</td>
<td>2,909</td>
<td>246</td>
<td>0</td>
</tr>
<tr>
<td>Other Income &amp; Revenue Grants</td>
<td>2,514</td>
<td>4,473</td>
<td>4,826</td>
<td>1,563</td>
<td>901</td>
</tr>
<tr>
<td>UDAY Grant</td>
<td>0</td>
<td>0</td>
<td>992</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Agricultural Subsidy (0.9*D)</td>
<td>8,691</td>
<td>11,490</td>
<td>7,367</td>
<td>10,033</td>
<td>5,009</td>
</tr>
<tr>
<td>Domestic Subsidy (0.1*D)</td>
<td>966</td>
<td>1,277</td>
<td>819</td>
<td>1,115</td>
<td>557</td>
</tr>
<tr>
<td>Net Revenue (C - B)</td>
<td>48</td>
<td>-5,995</td>
<td>-3,034</td>
<td>-5,173</td>
<td>637</td>
</tr>
<tr>
<td>Revenue (w/o subsidies &amp; grants) (E)</td>
<td>20,714</td>
<td>34,836</td>
<td>69,986</td>
<td>28,389</td>
<td>22,208</td>
</tr>
<tr>
<td>Net Revenue (w/o subsidies &amp; grants) (E - B)</td>
<td>-12,123</td>
<td>-23,235</td>
<td>-17,037</td>
<td>-17,884</td>
<td>-5,830</td>
</tr>
</tbody>
</table>

Source: Calculated using PFC Report on Performance of Power Utilities (over multiple years).

Note: PFC in their analysis assumes that 90 percent of the subsidies are agricultural and 10 percent of the subsidies are for households. The breakdown of State subsidies here follows the same assumption. Capital expenditures are included as part of total expenses. Revenue & Expenses in Rs crore, Energy in MU.

### Table A2. Tabulation of States by UDAY Bond Status

<table>
<thead>
<tr>
<th>States did not join UDAY</th>
<th>Delhi, Odisha</th>
</tr>
</thead>
<tbody>
<tr>
<td>States that joined UDAY but did not issue UDAY bonds</td>
<td>Arunachal Pradesh, Assam, Gujarat, Jammu &amp; Kashmir, Kerala, Mizoram, Nagaland, Puducherry, Sikkim, Tripura, Uttarakhand</td>
</tr>
<tr>
<td>States issued UDAY bonds</td>
<td>Andhra Pradesh, Bihar, Chhattisgarh, Goa, Haryana, Himachal Pradesh, Jharkhand, Karnataka, Madhya Pradesh, Maharashtra, Manipur, Meghalaya, Punjab, Rajasthan, Tamil Nadu, Telangana, Uttar Pradesh, West Bengal*</td>
</tr>
</tbody>
</table>

Source: UDAY Portal and CAG Audit Reports.

Note: West Bengal did not formally join UDAY but issued UDAY bond in early years. All other states that issued UDAY bonds signed the MoU to join UDAY. These Union Territories are excluded in our data–Andaman and Nicobar Islands, Daman and Diu, Dadra and Nagar Haveli, and Lakshadweep.
The paper presents a useful overview on the state of the power sector in India and the implications of the commitments towards the power sector on State finances.

The fiscal impact of power discom finances can be assessed in terms of the following three ways: (i) through timely payment of subsidies which make the finances of the discom more sustainable/viable, (ii) through periodic bailouts, which create uncertainty with regard to the finances of both the State and the discom, and (iii) through support for capex by discoms, which also causes the finances of discoms to impinge upon the finances of the States. The paper broadly highlights the reported improvements in the finances of the discoms in 2021-22 as:

- Reduction in Aggregate Technical and Commercial (ATC) losses—from 22 percent in 2020-21 to 16 percent in 2021-22;
- Improvement in the gap defined in various ways; and
- Better response from the States on subsidy payments.

The paper then goes on to argue that the accounting practices of the discoms are not transparent and therefore, do not allow for more effective analysis of the sources of losses or the “true” dimensions of the losses faced by the discoms. The paper also focuses on the need for better mechanisms for delivery of subsidies and proposes a mechanism for Direct Benefit Transfers in Electricity (DBTE).

Below are my brief comments on the paper.

First, as regards the overall regulatory and governance framework, the following two components merit an analysis of its impact on the performance of discoms:
1. Implementation of the late surcharge rule since June 2022 has perhaps ensured some discipline in the payments of dues by the discoms. The total dues of discoms in India, as reported in the website “praapti.in”, have declined to Rs 70,000 crore, with Rs 26,000 crore being in overdue amounts. The overdue monthly billing average is now reportedly worth less than two months for all the States.

2. The annual review and release of higher borrowing limits under the Revamped Distribution Sector Scheme (RDSS) provide a regular window for the review of proposed actions, which are incentivized by access to higher borrowing limits for the States. A total amount of Rs 1.43 lakh crore has been made available for the fiscal year 2023-24.

Second, there are considerable differences between the performance of various discoms, as is evident in the various figures presented in the paper. One clear category of States exhibiting poorer performance is that of the Special Category States. Among the other States, there are considerable differences, with some States reporting good performance and the others not matching up. The trend lines presented in some of the graphs in the paper actually depict an average of the performance of the two separate groups. One factor which leads to considerable differences among the States is the cost of power, which ranges from Rs 4.63 per KWH (for Chandigarh) to Rs 10.33 per KWH (for Mizoram). Even if these two extremes are ignored, there is considerable variation ranging between about Rs 5 per KWH and Rs 8 per KWH. This raises the question as to whether these costs signify a handicap for the discoms incurring higher costs. In other words, do we need to study the details for the relatively poor performers separately to be able to design suitable policies for overcoming these challenges?

Third, moving to the proposed DBTE, the idea is interesting in that it pre-determines the amount of the subsidy available and provides incentives for optimizing the consumption of electricity. The Fifteenth Finance Commission too had proposed the use of a DBT for electricity to usher in more discipline in the electricity sector’s finances. However, the presentation of the proposal in the paper is a little confusing, particularly the segment which presents arguments for considering DBTE. The question, “Who do the distribution companies serve?” seems to assume that the consumer would have a choice on whether to consume electricity or not or maybe whether they seek to consume from a particular discom vis-à-vis the others. Perhaps these choices do not exist. If the consumer chooses not to purchase power from the discom and disconnects the meter, there would be no flow of subsidy, unless it is transformed into a minimum income support kind of scheme. Would, therefore, a study of price and income elasticities be useful for designing a suitable programme?

In the examples presented in the paper, it is not clear whether the total payment accrues to the consumer, who in turn pays the electricity bill, or
whether the bill has to be paid by the government and any balance has to be “refunded” to the consumer. The two approaches can have different effects on the perceptions of the consumer.

The idea that the DBT should be unconditional and refundable is interesting. However, one needs to consider the challenge of keeping the real value of DBT in terms of the units of electricity stable over time.

Laveesh Bhandari
CSEP

The paper presents a thorough examination of the topic, acknowledging its complexity and the challenges inherent in addressing it, particularly within the electricity sector. The authors ought to be commended for their effort in tackling such a challenging subject. Before delving into the specifics, it is important to raise a broader question: Why is there a prevailing assumption in discussions like these that State governments may not prioritize what is right, or perhaps not to the same extent as the Central Government? This presumption appears to influence much of the discourse among economists.

As regards the paper itself, it provides a concise overview focusing on metering, monitoring, billing, and collections. These areas present significant hurdles in the context of electrification in India. Due to technological limitations, we face challenges in collecting sufficient revenues to cover expenditures. Consequently, the government resorts to subsidies, bailouts, and bank credit, which are not sustainable methods. The solution proposed in the paper involves implementing a Direct Benefit Transfer (DBT) system, wherein benefits are provided to the consumers upfront, and the billing reflects these transfers later. However, the effectiveness of this solution hinges on the quality of metering.

One intriguing aspect that has not been deeply explored is the unintended consequences of policies like UDAY, which are designed to impart benefits within the system but which potentially lead to perverse outcomes. This suggests that some elements of the current mechanism may be functioning effectively, a factor that warrants further consideration.

Moving to the overall solution presented in the paper, it appears multifaceted, with several layers needing thorough examination. These complexities can be efficiently examined by microeconomists. A crucial component to be considered is the role of the State regulator. Conceptually, the Cost-Plus pricing model has been employed in the paper, whereby expenditures are shared with the regulator for updating the pricing mechanism. However, if this equilibrium is not achieved over time, it points to flaws in the regulatory process.

The fact that most of the distribution companies (referred to as ‘discoms’ in the paper) are publicly owned may not be the sole cause of the challenges outlined in the paper. Evidence suggests that similar problems are also being
encountered in States where discoms are privately owned. This underscores
the need for a closer examination of State-level regulators and why their
mechanisms are not functioning optimally.

However, focusing solely on the State-level regulator may not fully resolve
the issue, as these regulators are somewhat susceptible to pressures from the
State governments. While there is substantial literature on regulatory takeovers,
there is comparatively less on takeovers involving public sector regulators. It
would be beneficial for the paper to delve deeper into understanding how State
governments align their incentives with those of the regulators.

Regarding the point about DBTs, it leads to another consideration. Imagine
a scenario where an upstream firm holds a monopoly, while downstream firms
are government-owned. The monopolistic upstream firm generates substantial
profits, while the downstream firms suffer losses due to high charges imposed
by the upstream firm. In the context of Indian public sector energy firms,
the profitable entities are predominantly upstream, such as Coal India and
NTPC, while downstream firms struggle financially. This structural imbalance
complicates the implementation of solutions like DBTs, as subsidies may still
be required from government-owned downstream firms, regardless of transfers
from any State government.

It is crucial to explore these market structure dynamics. If a particular
government were to provide DBTs, another government might respond with
increased subsidies, thereby nullifying the intended benefits. Hence, these
aspects merit further investigation in the paper.

General Discussion

The Chairperson, Devesh Kapur began the discussion by stating that most of
the government reports on the electricity sector deliver the clear narrative that
the sector has been sustainable for the past 50 years, which implies that the
performance of the sector has been sub-par but not alarming in a fiscal sense.
He also stated that hitherto the Centre has had a larger share in implementing
electricity reforms than the States. The travails of the electricity sector are
also interlinked with agriculture, because a majority of the voters in India are
associated with this sector. Lastly, he noted that the selection process of staff
among the State regulators needs to be made more efficient.

Arvind Panagariya pointed out that State regulators are usually appointed
from among the bureaucracy. However, the regulators at the Centre ostensibly
work better than their counterparts at the State level. He also noted that a few
years ago, several economists had recommended privatization of the distribution
companies to solve the issues in the electricity sector, but that seems to have
gone into the background because discoms have accepted subsidies. In such
a situation, it may be better to ensure that the distribution companies become
profitable instead of running them continuously as public sector entities, which would be a sub-optimal exercise. He also added that all the subsidies for electricity and fertilizers currently go predominantly to large farmers while the small farmers do not get much of them.

Govinda Rao highlighted the following distortions in the DBT scheme: (1) cross-subsidization as a result of which much of the burden is borne by the large industry—since it cannot depend upon the distribution utilities, it needs captive power generation, which is highly expensive; and (2) adequate provision is not made for depreciation replacement and maintenance of assets, which results in huge outages of electricity. These outages, in turn, have an economic impact in terms of the high cost of power for the manufacturing sector.

Montek Ahluwalia suggested that all the subsidies should be converted into DBTs, which will reveal who is actually benefiting from these subsidies. Subsidies also need to be provided for food if the goal is for India to become a more developed country by the middle of this century. The electricity subsidies can be limited to those who are eligible for the food subsidy, and putting in place a well-defined system will automatically eliminate the distortions. He also asserted that privatizing the distribution companies would enable them to not just get good talent but also become more management-oriented. He further flagged the need for State governments to exercise fiscal discipline. In addition, it is important to consider other issues such as the expansion of renewable energy to meet the Net Zero targets, and align them with the climate change objectives, as well as achieving energy efficiency by reducing the dependence on fossil fuels.

Martin Wolf argued that electrification would mean that electricity supply and usage have to grow much faster than a colossal investment program. For each kilowatt hour, the government loses a colossal fortune. Hence, the sustainability of the entire electricity system is a key question to be considered in any scheme.

Seema Jayachandran endorsed the advantages of DBTEs listed in the paper, including the fact that the customer on the margin has an incentive to conserve electricity and accurately report consumption. She also asked if it were possible to introduce a technology whereby the data could be aggregated into Smart Meters, and shared with the regulator, which would facilitate benefits based on accurate reporting versus the on-margin incentives.

Junaid Ahmad raised the issue of political economy, which probably explains why utility reforms in the water and electricity sector have so far failed to achieve optimal results. He remarked that DBTEs could constitute an important entry point for electricity reforms, and need to be taken forward effectively.

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Workers, Managers, and Productivity: How Investments in Workers can Fuel India’s Productivity Growth

*Workers, Managers, and Productivity: How Investments in Workers can Fuel India’s Productivity Growth

ABSTRACT We describe a set of stylized facts on India’s manufacturing productivity, showing that aggregate productivity growth in India has slowed considerably in the past decade and has been, on average, negative in the past several years. There is also substantial variation in productivity across India, even when controlling for State and industry effects. We focus on one potential determinant of this variation, namely, firms’ investments in their workers. A robust positive association exists between such investments and firm output per worker, even within State and industry. This relationship suggests but does not dispositively demonstrate, that investing more in workers causes productivity improvements. We, therefore, review the literature on four categories of investments in workers that show a high potential to raise productivity: soft skills, voice, environmental conditions, and managerial quality. In each case, we focus on studies that demonstrate the relationship between investments and productivity causally, most often via prospective Randomized Controlled Trials (RCTs). We end with a description of why firms may be systematically under-investing in workers and why more evidence is needed to understand firm behavior.

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Keywords: Manufacturing, Productivity, Management, Soft Skills, Voice, Climate Adaption, India

JEL Classification: J24, L22, M53, O14

1. Introduction

India’s manufacturing sector is widely held as a key to the ongoing structural transformation of its economy, the pathway for millions of low-income Indians to grow their incomes out of poverty, and a linchpin of India’s overall economic competitiveness on the global stage (Aggarwal and Kumar 2015). Indian manufacturing is particularly important given the accelerating global demand to shift supply chains away from China (Ghosh and Mukherji 2020). The United States, the European Union countries, and other large economies view India as a primary destination towards which key aspects of global production could move. However, absorbing this potential demand would require a massive expansion of manufacturing capacity within India (Rajan 2015; Iyer 2018). Raising manufacturing’s share of GDP from 16 percent to 25 percent in the coming decade is a key stated goal of the Government of India (Iyer 2018; Barhat 2023). At the heart of the government’s focus on manufacturing as a source of growth stands the “Make in India” program—to reduce dependence on China and other major sources of imports—which also necessitates substantial manufacturing growth (Anand et al. 2015). In particular, the program aims to raise manufacturing growth by 12-14 percent per year, create over 100 million jobs in the manufacturing sectors, allow poor and rural populations to acquire the skill sets necessary to benefit from this growth, increase domestic value added, and improve India’s global competitiveness in manufacturing (Iyer 2018). These goals consequently imply that manufacturing productivity is of critical importance as India wishes to position itself as a major player in the global “friendshoring” trend, as well as for India’s desire to be more self-reliant in the production of consumer goods (Kumar 2022; TNN 2023).

We begin by examining trends in India’s manufacturing productivity to establish some basic stylized facts related to aggregate productivity growth and the dispersion in productivity across States and industries. Our takeaway from these statistics is that the growth in manufacturing productivity, as measured by sales per worker, has slowed considerably in the past decade, particularly in the several years leading up to the start of the COVID-19 pandemic in 2020. There is also considerable heterogeneity in productivity across Indian States: States in Western and Central India tend to have the highest average productivity, while States in the East and South have the lowest. These cross-State differences persist when controlling for State industrial composition. More generally, in alignment with the extensive economics literature on productivity dispersion,
the difference in productivity across the most and least productive firms is vast in India, even after controlling for State and industry effects.

Having established these trends, we focus on firms’ investments in their workers as one potential determinant of firm productivity. This determinant has received less academic and policy attention than others—e.g., in terms of capital misallocation and regulatory distortions, among other things. While studies in economics have long recognized the importance of on-the-job human capital accumulation (e.g., Mincer 1962; Becker 1964), advances in the estimation of causal treatment effects via RCTs or plausibly exogenous variation in investment have made possible the investigation of the impacts of such investments in the real world, particularly in low-income country contexts, where worker productivity is on average low (Bloom and Reenen 2010). To begin, we study this phenomenon across India by examining the relationship between productivity and so-called emoluments, which include wages and the value of all benefits provided to employees. We find that the two variables are very closely positively associated, indicating that the elasticity of productivity with respect to emoluments is nearly one-for-one in percentage terms. This magnitude remains unchanged when controlling for State-by-industry fixed effects and additional controls.

Although quite robust, the positive association between worker investment and productivity is not necessarily causal: unobserved choices of the firm may be correlated with both wage and benefit provision to employees, on the one hand, and productivity on the other. We then focus on various categories of investment in workers and the causal evidence for their impacts on productivity. We look in particular at the potential impacts of investments in enhancing/ameliorating soft skills, voice, environmental conditions, managerial quality, and health for workers. Within each category, we review studies that establish causal impacts via prospective RCTs or via the use of credibly exogenous variation. We highlight the productivity impacts of such investments when these estimates are available but also study other worker outcomes of relevance to the overall profitability of firms, e.g., turnover, absenteeism, and task complexity, among others. We then discuss various reasons for firms’ under-investment in their workers, the barriers that firms face, and market-related reasons for non-investment. Finally, we highlight the need for more research to understand firm behavior.

2. Some Stylized Facts on Manufacturing Productivity in India

2.1. Fact 1: Productivity Growth in Indian Manufacturing is Slowing

Throughout this section, we use data from the Annual Survey of Industries (ASI), comprising a representative sample of Indian manufacturing firms (and a census of large firms). We define productivity as revenue (sales) per worker.
Recent research shows that total factor productivity growth in manufacturing has been slowing down in India, especially in the last decade (see Erumban et al. 2019; Krishna et al. 2020; Rawat and Sharma 2021, for example). These patterns are reflected in aggregate output per worker. Figure 1 shows the trend in the series of aggregate (pan-India) annual real productivity growth in manufacturing from 1995 to 2020. The figure reveals a general downward trend in productivity growth since the 1990s, decelerating in the mid-2010s and the years leading up to the COVID-19 pandemic. The growth rate of productivity was trending down, fluctuating between 5 and 10 percent in the 1990s and 2000s. Productivity growth began to stagnate more after 2012, and this negative trend accelerated into the several years preceding the pandemic, even leading to negative growth rates for certain years.

**FIGURE 1. Growth Rate of Aggregate Real Sales per Worker**

Source: Authors’ calculations using various Annual Survey of Industries (ASI) rounds.  
Note: For every year, we compute the ratio of aggregate sales in 100,000 INR of 2020 to the aggregate number of workers across India. We compute the growth rate from year to year and plot the smoothed series. We use a locally weighted regression (lowess) smoother with a corresponding bandwidth of 0.2, meaning that each point represents a weighted average of the year of observation, the previous and subsequent two years.

2.2. Fact 2: Indian Manufacturing Productivity is Several Times Lower Than That of the United States

Consistent with an extensive literature documenting differences in productivity across countries, the level of manufacturing productivity in India ($92,800) in
2020 was close to a seventh of manufacturing productivity in the United States ($652,400, taken from the U.S. Annual Survey of Manufacturers (2021)). This is true even after adjustment for purchasing power (after accounting for PPP, Indian productivity rises to $314,200 per worker, still only half of the figure in the U.S.).

2.3. Fact 3: Productivity Differs by High-skill and Low-skill Industries

We show that the productivity growth rate in low-skill manufacturing is decelerating faster than in high-skill manufacturing industries. Figure 3 plots the smoothed growth rate series for industries above and below the median in terms of their intensity in abstract tasks, which are associated with high-skill work. We follow an approach Gauthier (2023) developed to establish which industries are intensive in abstract tasks. Autor et al. (2003) and Acemoglu and Autor (2011) classify U.S. occupations based on task intensity. Abstract tasks are defined by Acemoglu and Autor (2011) as “activities that require problem-solving, intuition, persuasion, and creativity. These tasks are characteristic of professional, managerial, technical, and creative occupations, such as law, medicine, science, engineering, design, and management, among many others.” U.S. and Indian occupations map into the International Standard Classification of Occupations (ISCO) allowing Gauthier (2023) to import the task-composition classification at the occupation level in India. To construct a measure of the abstract-task intensity at the industry level, Gauthier (2023) then uses the National Sample Survey, which contains the occupation and industry the individual works in. This allows the author to measure how intensive the different Indian industries are in terms of abstract tasks. In Figure 3, we use this procedure and define high-skill industries as those above the median in terms of abstract-task intensity in 2010.

The growth rate in productivity for high-skill industries is positive and trending up until 2015. It remains positive but starts to trend down until 2020 when it becomes negative. Instead, the growth rate is trending down for the whole period in low-skill industries and becomes negative as early as 2017. This provides suggestive evidence that upgrading production processes by moving away from highly manual production processes and skilling up workers may, at least, lower the decline in productivity growth.

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1. We calculate the sales per worker for India using ASI, 2020 summary tables using total output and workers employed. The sales per worker for the US is calculated using Annual Survey of Manufacturers, 2020 (U.S. Census Bureau 2020). We use the average value of the rupee in 2020 for the nominal exchange rate. The nominal exchange rate and PPP values come from the OCED data (OECD 2023).
FIGURE 2. Growth Rates at the Three-digit Industry Level by Skill Requirements

Source: Authors’ calculations using various Annual Survey of Industries (ASI) rounds.

Note: For every year, we compute the ratio of aggregate sales in 100,000 INR of 2020 to the aggregate number of workers by three-digit industries using the National Industrial Classification (NIC). Because of changes in the NIC, we limit our analysis to years where the ASI data uses the latest NIC, corresponding to 2010 onwards. We compute the growth rate from year to year for each industry. Then, we compute the yearly average growth rate and plot the lowess-smoothed series for low-skill and high-skill industries, respectively. We follow an approach Gauthier (2023) developed to establish which industries are intensive in abstract tasks. Autor et al. (2003) and Acemoglu and Autor (2011) classify U.S. occupations based on task intensity. Abstract tasks are defined by Acemoglu and Autor (2011) as “activities that require problem-solving, intuition, persuasion, and creativity. These tasks are characteristic of professional, managerial, technical, and creative occupations, such as law, medicine, science, engineering, design, and management, among many others.” U.S. and Indian occupations map into the International Standard Classification of Occupations (ISCO) allowing Gauthier (2023) to import the task-composition classification at the occupation-level in India. To construct a measure of the abstract-task intensity at the Industry level, Gauthier (2023) then uses the National Sample Survey, which contains the occupation and industry individuals work in. This allows for the author to measure how intensive the different Indian industries are in terms of abstract tasks. We use this procedure and define high-skill industries as those above the median in terms of abstract-task intensity in 2010.

2.4. Fact 4: There is a Large Dispersion in Manufacturing Productivity across Indian States and Industries

Using factory-level data from 2010 to 2020, we first net out three-digit industry and year fixed effects from real sales per worker and compute the average residual sales per worker at the state level. In Figure 3, we plot the (standardized) deviation in residual sales per worker for each State and Union

2. We add the mean value of real sales per worker to the residual to preserve scale.
FIGURE 3. Deviation of Sales per Worker from the National Average at the Three-digit Industry Level by Skill Requirements

Source: Authors’ calculations using various Annual Survey of Industries (ASI) rounds.
Note: Using factory-level data from 2010 to 2020, we regress sales in INR of 2020 per worker at the factory level on 3-digit industry, year fixed effects. The residuals of this regression represent real sales per worker net of industry composition differences and yearly shocks. Note that we add the mean value of real sales per worker to the residual to preserve scale. We then compute the average residual sales per worker at the State level and plot the standard deviation in residual sales per worker for each State and Union Territory relative to the national average. The output per worker is the largest in ascending order in Delhi, Sikkim, Goa, Himachal Pradesh, and Uttarakhand. It is the lowest in Chhattisgarh, Arunachal Pradesh, Mizoram, Andaman & Nicobar Islands, and Ladakh, with the latter being the least productive.

Territory relative to the national average. There is substantial variation in the average productivity across the country. For example, the sales per worker in INR of 2020 of the State at the 10th percentile of this productivity distribution is 1.8 million INR ($24,300), as compared to the 90th percentile, which is 9.1 million INR ($122,700). This difference remains substantial even after accounting for State-level industry composition and yearly shocks. The residual
difference is still large: 3.8 million INR ($51,500) at the 10th percentile versus 8.8 million INR ($114,500) at the 90th percentile. The adjusted difference is nearly 90 percent of the average productivity level across India. Western and Central Indian States tend to have higher industry-adjusted productivity in manufacturing, while the case is opposite for the Southern and Eastern States. This is in contrast to the GDP per capita ranking of States, in which the Southern States tend to have higher incomes than their Western and Central counterparts.

| TABLE 1. Conditional Association between Productivity and Non-wage Benefits |
|-------------|--------|--------|
|             | (1)    | (2)    | (3)    |
| Log(real emoluments) | 0.333*** | 0.340*** | 0.321*** |
|             | (0.0196) | (0.00807) | (0.00721) |
| Log(number of workers) | -1.081*** | -1.052*** | -0.996*** |
|             | (0.0604) | (0.0325) | (0.0234) |
| Log(real wages) | 0.661*** | 0.640*** | 0.615*** |
|             | (0.0463) | (0.0262) | (0.0192) |
| Observations | 344583 | 344583 | 344583 |
| Year FE     | N      | Y      | Y      |
| State FE    | N      | Y      | Y      |
| NIC3 FE     | N      | Y      | Y      |
| StateXyear FE | N  | N      | Y      |
| NIC3Xyear FE | N  | N      | Y      |
| StateXNIC3 FE | N | N    | Y      |
| StateXNIC3Xyear FE | N | N | Y |

Source: Authors’ calculations using various Annual Survey of Industries (ASI) rounds.
Note: We define non-wage benefits as the sum of PF (contribution to provident and other funds) and welfare (workers and staff welfare expenses). Using factory-level data from 2010 to 2020, we regress log sales in INR of 2020 on log real non-wage benefits, log real wages, and log number of workers at the factory level. In Column (2), we include year, State, and three-digit industry fixed effects. In Column (3), we add State-by-industry time trends. The standard errors are clustered at the three-digit by State level. ***, **, * indicates statistical significance at the 1 percent, 5 percent, and 10 percent levels, respectively.

2.5. Fact 5: Productivity is Strongly Correlated with firms’ Investments in Their Workers

We next examine firms’ investments in workers and how these relate to productivity. As a proxy for investment, we use non-wage benefits, data on which are collected for every firm in the ASI. We define non-wage benefits as total payments made by the firm to its employees other than wages and bonuses. It includes goods or services provided to employees free of cost or at

3. Note that the results also hold if we include wages and bonuses as part of emoluments.
A subsidized rate (e.g., medical facilities, recreation, compensations to attend religious festivals). Using factory-level data from 2010 to 2020, we first net out three-digit industry and year fixed effects from the log of real sales per worker as from the log of real non-wage benefits per worker and compute the average residuals at the state level.\(^4\) In Figure 4, we plot the residuals against one another. As is evident, there is a tight positive association between output and emolument per worker across States. The figure suggests that a 1 percent increase in non-wage benefits per worker is associated with 0.5 percent higher output per worker.

**FIGURE 4.** Association between Residual Log Productivity and Residual Log Non-Wage Benefits

![Plot showing the association between residual log productivity and residual log non-wage benefits.](image)

Source: Authors’ calculations using various Annual Survey of Industries (ASI) rounds.

Note: We define non-wage benefits as the sum of PF (contribution to provident and other funds) and welfare (workers and staff welfare expenses). Using factory-level data from 2010 to 2020, we regress log sales and log non-wage benefits in INR of 2020 per worker at the factory level on three-digit industry, year fixed effects. The residuals of these regressions represent log real sales and log real non-wage benefits per worker net of industry composition differences and yearly shocks. Note that we add the mean value of each variable to the corresponding residual to preserve scale. We then compute the average residual log real sales and residual log real non-wage benefits per worker at the State level and plot one variable against the other.

In Table 1, we regress log productivity on log non-wage benefits controlling for firm size and wages, finding an elasticity close to 0.3 in percentage terms. After accounting for State and industry differentials, this relationship remains

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\(^4\) We add the mean value of the variables to the residuals in order to preserve scale.
unchanged, allowing for State-by-industry time trend differentials. This last, most stringent specification reflects the idea that the positive association between investments in workers and productivity persists even when comparing firms operating in the same industry and located in the same Indian states. The coefficient changes very little with the addition of progressively more stringent fixed effects and controls.

3. Causal Evidence on the Impacts of Investments in Workers

The significant association between investment in employees and productivity suggests that part of this relationship may be causal. Unobserved correlates of worker investments and productivity might generate bias in estimating the impact of these investments on worker productivity. In this section, we explore different types of employee investments and evaluate their causal implications on productivity by examining studies that use RCTs or rely on convincingly exogenous variation in the level of investments.

3.1. Category 1: Soft Skills

In the manufacturing sector, most emphasis on worker training is focused on “technical skills” due to, among other reasons, the repeated nature of tasks expected from these workers and the labor-intensive nature of the job (Bassi and Nansamba 2022; Borghans et al. 2008; Deming 2017; Groh et al. 2012; Guerra et al. 2014; Heckman and Kautz 2012; Heckman et al. 2006; Montalvao et al. 2017). While these are crucial skills, particularly for frontline tasks, a growing pool of evidence has showcased the benefits of developing non-technical or "soft" skills. Many of these studies, primarily focused on OECD countries, provide correlational evidence of how soft skills, such as time management, effective communication, problem-solving, and teamwork, contribute substantially to on-the-job quality and earnings. Teaching soft skills through vocational and entrepreneurship training might also help job-seekers become better candidates and transition into long-term employment.

Recent evidence from India shows that the benefits of investing in soft skills for large-scale manufacturing firms can improve well-being and productivity outcomes for female garment workers, resulting in a high return on investment. Working with workers from an Indian garment factory in Bangalore, Adhvaryu et al. (2023c) evaluated a soft skills training program and its impacts on employee and employer outcomes in a trial covering approximately 2,700 workers. The program tested was the Personal Advancement and Career Enhancement (P.A.C.E.) training program (developed by GAP, Inc.) for female garment workers. The program emphasized communication skills, time management, decision-making skills, financial literacy, and problem-solving
skills via weekly workplace group sessions. Using firm administrative data, the researchers measured workplace outcomes such as retention, productivity, and salary. Survey data measured changes in baseline levels of knowledge, behaviors, and personality traits of workers. The study found that on-the-job soft skills training among Indian female garment workers increased productivity by 13.5 percent without increasing turnover. It also found significant gains for the firm to invest in such a program; 20 months after the end of the training program, the net rate of returns to the firm climbed to over 250 percent. These results show that personality changes through soft-skills training can lead to significant productivity gains for the firm, contributing to an overall high return on investment in the long run.

Soft skills can also be a helpful tool for small-medium enterprises (SMEs) and micro-entrepreneurs in the manufacturing industry, who otherwise do not have the resources to make large worker investments to boost productivity. Campos et al. (2017) evaluated how improvements in the soft skills of micro-entrepreneurs impacted business sales effectiveness and profitability in Togo. The study provided two different types of training interventions: a standard business training on best practices (examples of modules taught included record keeping, stock control, and marketing skills) and a novel psychology-based personal initiative training program that focused on changing mindsets around self-starting behavior, innovation, identifying and exploiting new opportunities, goal-setting, planning, feedback cycles, and overcoming obstacles. Results from this study show that as compared to business training, the psychology-based personal initiative training program that teaches a proactive mindset and focuses on entrepreneurial behaviors increased firm profits by 30 percent over two years. The authors observed heterogeneity in treatment effects by gender. Women who received personal initiative training saw their profits increase by 40 percent, as compared to a 5 percent increase for those who had traditional business training. The training program ended up being affordable, with the break-even point being less than one year.

Manufacturing firms can choose to bundle soft skills training with technical or on-the-job skills to provide more opportunities for workers to boost their earnings and for firms to increase their productivity by hiring and retaining 'well-rounded' workers. Chioda et al. (2021) studied the effects of a three-week skills development program for high school students in Uganda. The program featured two treatments: the hard-skills MBA featured a mix of approximately 75 percent hard and 25 percent soft skills; the soft skills curriculum had the reverse mix. After a three-year follow-up, the results showed that the training effectively improved both hard and soft skills. However, only soft skills were linked to self-efficacy, persuasion, and negotiation improvements. The skill upgrade resulted in substantially higher earnings for participants, 32.1 percent and 29.8 percent increases for those who attended hard and soft training, most of which was generated through self-employment. Furthermore, the youth
in both groups were more likely to start enterprises and be more successful in ensuring their business’s survival. The program led to significantly larger profits (24.2 percent and 27.2 percent for hard skills and soft skills treatment arms) and more significant business capital investments (38.4 percent and 32.6 percent for hard skills and soft skills treatment arms).

In sum, there is growing consensus that investing in developing soft skills, such as time management, communication, and problem-solving, can yield significant benefits for both workers and employers. Studies reveal that soft skills training can enhance productivity, earnings, and job quality, especially in the manufacturing sector, where soft skills training has significantly contributed to productivity. Research also reveals gender differences in the impacts of soft skills on workers/entrepreneurs, with women benefiting from such training more than men. Finally, integrating soft skills training with technical skills training has proven to be highly effective in equipping workers for success.

3.2. Category 2: Voice

Relationships between employers and workers are vital for worker well-being and productivity. Employment may offer workers a sense of safety and comfort, and a strained relationship between employer and worker could negatively affect productivity and worker outcomes (job satisfaction, utility), possibly resulting in increased worker turnover. Hirschman (1970) famously championed the idea of "voice" in the employment relationship; workers have a choice when facing a challenge or grievance that threatens the relationship between employers and employees. They can either voice their discontent and precipitate improvements in this relationship or exit the employment relationship by leaving the firm. Increasing workers' ability to use their voice could thus improve the relationship between workers and their employers, thereby increasing productivity via reductions in turnover, workplace effort, and improved information flow and coordination (Malcomson 1983; Freeman and Lazear 1995).

After a disappointingly small statutory minimum wage increase in 2016, Adhvaryu et al. (2022b) conducted an RCT within a garment firm to understand the importance of furthering workers' voices, especially during times of general discontent within a workplace. Workers were asked at random to fill out a feedback survey in which they were asked about their feelings regarding their supervisors, overall worker satisfaction, satisfaction with the firm, their wages, and their jobs. This study found that enabling voice reduced turnover and absenteeism after the hike, particularly for the most disappointed worker. This effect was most substantial for workers who were most disappointed with the wage increment. At the average deviation from wage hike expectations (about 17 USD), treated workers were 16 percent less likely to quit than control workers; however, the treatment did not affect those whose expectations were exactly met. This study shows the benefits of enabling worker voice, especially during
and after significant workplace policy changes (particularly corresponding to the wage).

While engaging with workers and enabling worker voice during periods of crisis or uncertainty within a firm would be helpful, encouragement of this voice should move beyond situational-specific instances into a longer-term goal for firms to engage with workers through different accessible mechanisms, such as technology platforms designed to facilitate anonymized worker feedback. Adhvaryu et al. (2021) evaluate the impact of increasing worker voice through a two-way, SMS-based anonymous communication tool in two garment factories in India through an RCT. In the intervention, workers were able to send their grievances and suggestions about the workplace to their factory Human Resources (HR) department via SMS. The system masked the sender's phone numbers, ensuring anonymity, and this was communicated to the worker. While only 5 percent of the treated workers used this tool, the study found that the device reduced absenteeism by 5 percent and attrition by 10 percent among the treated workers as compared to the control group workers. To further sustain the impacts of worker voice improvements, especially when firms face increased worker hesitancy or low-take up of feedback mechanisms, research shows that it may be beneficial for firms to incentivize staff to address the concerns of their workers fairly and accurately. Adhvaryu et al. (2023a) tested a voice- and SMS-based anonymous two-way communication tool in 43 garment factories in India with randomization at the factory level. One group of randomly chosen factories received the communication tool alone, through which they could report their grievances to factory HR, and another received the tool, plus an incentive program for HR to resolve incoming cases promptly and accurately. The authors found that the tool plus incentives reduced worker absenteeism and increased factory productivity by 7.2 percent, while the tool alone had zero impact.

An alternative to building tools to further worker voice is adapting existing feedback mechanisms and making them more accessible to the workforce. Large manufacturing firms can adopt traditional evaluation procedures, such as 360-degree feedback, to boost workers' voices. Cai and Wang (2022) conducted a study among auto workers in China in which workers were allowed to evaluate their managers on managerial quality and well-being-related metrics. They found that by letting workers participate in the evaluation process, they essentially turn a top-down approach into a “360” evaluation that includes subordinates' experiences. They found that providing feedback reduced worker turnover by 50 percent and increased team-level productivity by 2.3 percent. These gains can be explained by changes in the behavior of managers and improved relationships between managers and workers. Although the evaluation system did not affect individual performance, team-level key performance indicators did increase significantly. This result is driven by the fact that treated teams have less worker turnover than control teams, and high turnover reduces
productivity because new workers typically perform poorly at the beginning of their term and tend to require substantial training to be brought up to steady-state levels of productivity.

In developing countries, the structural mechanisms to enforce labor regulations are weak for many reasons, including a lack of resources (Dal Bó and Finan 2016). In the case of the manufacturing sector, many multinational corporations (MNCs) enforce global standards of labor rights for their suppliers. Boudreau (2020) conducted an RCT in Bangladesh to assess the effects of MNC enforcement on establishments' compliance with Bangladesh's Safety Committees (SC) law. The study tested a six-month SC intervention to bring establishments into meaningful compliance with the law, which entailed monitoring SC activities and limited capacity building for SC members. The results showed that the stronger committees had a small but positive impact on safety, with large impacts on factories with better managerial practices. These improvements did not come at the cost of productivity, wage reduction, or employment. Earning worker trust through transparent investments in their well-being and effective and communicative management would lead to a stronger worker voice and foster a positive working environment.

The relationship between employers and employees is pivotal for productivity and job satisfaction. Research indicates that giving workers a voice can enhance productivity by reducing employee turnover and improving teamwork. Cai and Wang (2022) showed that workers evaluating their managers experienced reduced turnover, which led to increased team-level performance. In India, research indicated that enhancing worker voice, especially during times of discontent, substantially reduced the likelihood of employees quitting. Additional studies involving two-way anonymous communication tools showed reductions in absenteeism and significant productivity increases when the tools were coupled with incentives for HR to address issues promptly and efficiently.

3.3. Category 3: Environmental Conditions

Workers’ physical environment likely has a significant influence on well-being and productivity. The growing rates of extreme heat and pollution, particularly in urban settings in low-income countries, which are accelerating due to climate change, potentially threaten worker health, well-being, and consequently, firm productivity.

Temperatures are rising drastically in India; according to the meteorological department, in 2022, India experienced the hottest March since 1901. Since April 2022, 90 percent of the country has been at increased risk from hunger, loss of income, or premature death during record-breaking heat waves, which are becoming more common due to climate change (Debnath et al., 2023). These rising temperatures are, therefore, likely to cause adverse effects on the productivity of workers, especially in the manufacturing sector, where workers work long shifts in cramped working spaces.
Somanathan et al. (2021) studied the effects of rising temperatures on worker productivity in the States of Delhi and Gujarat, also focusing on how these effects vary between manual laborers and laborers in automated manufacturing settings. The researchers found that for a one-degree Celsius increase in temperature, productivity subsequently saw a two-percent reduction. Within these industries, when firms invest in cooling technologies, the authors show that the magnitude of the effect of temperature on productivity declines; this shows that investments in solutions to mitigate extreme heat, such as cooling systems, can benefit firms.

Adhvaryu et al. (2020) estimated the productivity consequences of adopting energy-saving technology (LED lighting) using daily production line-level data from large garment firms operating factories in and around Bengaluru. The garment factories initially used incandescent bulbs, the heat emanating from which would increase temperatures on production floors, affecting workers' productivity, especially on exceedingly hot days. The authors show that introducing LED lighting on factory floors contributes less heat to the factory environment and thus attenuates the negative relationship between mean daily outdoor temperatures and productivity. Specifically, introducing LEDs eliminates roughly 85 percent of the negative impact of temperature on worker efficiency during relatively hot days, which accounted for firm-wide productivity increases and shifted the overall break-even point for the firm from over three and a half years to less than eight months.

Most major cities in India have faced increasingly worsening air quality. In 2022, India had 14 out of the 20 most polluted cities in the world with fine particulate matter (PM 2.5) concentrations (Hindustan Times 2022). There are clear consequences for health, such as decreased lung function, vision problems, and cognitive difficulties for people who live in these areas and breathe polluted air over long periods, which could generate substantial productivity losses for workers and firms. For example, the Clean Air Fund (2019) estimates that India loses three percent of its GDP yearly due to air pollution because of workers falling sick and decreased footfall for businesses when people stay home.

As it is often implausible to eliminate the cause of air pollution, managers must develop strategies to deal with unforeseen absenteeism when it affects a worker's health. To better understand which characteristics enable managers to best cope with air pollutants to ensure their workers remain productive, Adhvaryu et al. (2022a) studied how productivity was affected because of particulate matter (PM) pollution. The researchers used detailed firm administrative data on managers and worker productivity, and survey data that captured task assignments and managerial characteristics. In addition, air pollution measurements were collected using five particulate matter monitors (PM) positioned at different locations in a garment factory. The monitors were placed to measure impacts using fluctuations in exposures to PM levels that vary at the line segment-by-hour level. The results show that sizable particulate
matter pollution shocks are commonplace and that worker- and line-level productivity suffers during these shocks. This relationship between pollution and productivity is small and linear; a one-standard-deviation increase in pollution decreases efficiency (a standardized productivity measure in the ready-made garments sector) by half a percentage point.

Further event study analysis confirms that large pollution shocks immediately affect worker productivity, with impacts varying across the tasks the worker performs and the worker themselves; impacts are 60 percent larger for workers performing complex tasks and 35 percent larger for older workers. In addition, they also find differences in how workers are allocated to tasks in production lines. Managers who notice productivity declines in particular workers may find it optimal to re-assign these workers to tasks in a way that reflects the limited ability of affected workers to exert effort in their assigned jobs. The probability of task re-allocation on production lines increases by three percentage points following a one-standard deviation increase in pollution. This shows that during a "pollution shock," workers are allocated away from the tasks that they are (idiosyncratically) "best" at in non-shock periods. This is because pollution shocks affect workers' performance most for baseline high-efficiency tasks; it may be optimal for managers to assign workers to tasks they are not well suited to, especially in the absence of shocks.

In sum, ambient temperature and air quality can significantly influence workers' well-being and productivity, especially in low-income countries. With the increased pollution and extreme heat due to climate change, workers' health and productivity are at risk. Poor air quality in India has been linked to health issues such as lung problems and cognitive difficulties, leading to productivity losses. Studies have shown that elevated pollution levels and temperature directly affect workers' efficiency, more so in labor-intensive industries. However, investing in solutions such as cooling technologies and energy-saving lighting can mitigate the negative impact of these environmental factors. Adaptive management strategies, such as re-assigning workers to different tasks during pollution spikes, can help maintain productivity. Investing in environmental adaptations and responsive management can be crucial for safeguarding workers' health and ensuring productivity in the face of environmental challenges.

### 3.4. Category 4: Managerial Quality

Managers play an essential role in firm performance. Hiring and training good managers can help improve workers' well-being, boost productivity, and ultimately improve the firm's profitability. In Bloom et al. (2013), the authors ran a large multi-plant RCT with textile firms in India. The treatment, consisting of a five-month management consulting training, covered modern management practices for textile firms. Within the first year of running this intervention, firm productivity increased by 17 percent, raising annual profit by over $300,000.
When the authors followed up on these firms eight years later, treated firms showed lasting impacts on productivity, which was 35 percent higher than the control group.

Recent work in India also sheds light on the relationship between managerial quality and productivity. Adhvaryu et al. (2023d) study what aspects of managerial quality are most related to performance and what workplace policies might allow for better selection and training of managers. Researchers observe that productivity among garment factory workers increases as teams spend more time making the same type of garment, with learning occurring faster when teams work on new orders. Teams also retain what they had previously learned (from making prior similar garments), and this knowledge decays over time. Their study leveraged survey data from managers of around 120 production lines and complemented this with two years of granular productivity data. They find that managerial attention and control are the most important for enabling line productivity, both more impactful than traditionally emphasized dimensions like cognitive skills and tenure. Better managers contribute to productivity by allowing faster learning-by-doing by workers. These results show that what makes a good manager depends on the firm’s needs. Similarly, the quality of a manager is variably defined. In certain situations, specific management practices matter more than others, and considering these differences helps firms train their workers effectively.

Building on this work, Adhvaryu et al. (2023b) evaluated the impacts of a nine-month soft skills training program administered to garment production line supervisors in a set of Indian garment factories. For workers in these production lines, their interactions with the supervisors are a considerable portion of their day-to-day life and their experience with work. Having a more effective manager may increase productivity as well as the compensation of workers. The training focused on the individual competencies of the supervisor, followed by their roles as supervisors, team members, and, ultimately, leaders. After randomizing access to this training program for workers and supervisors, the researchers found that lines supervised by trained supervisors were 7 percent more productive during training and 6 percent more effective post-training. Trained managers were 15 percent less likely to quit. The results of this study point to competing incentives of middle management, particularly around the costs of supervisory turnover, as one of the causes of the misallocation of training.

Studies on managerial quality also document how differences in attitudes towards managers may impact managerial effectiveness, irrespective of skills and/or managerial training. In Macchiavello et al. (2020), the researchers ran an experiment in Bangladesh where male and female candidates at the margin of promotion were promoted to supervisory positions. Their study found that female supervisors initially have lower productivity and evaluation from subordinate workers than their male counterparts. These gaps disappear after
4-6 months. Initial worse performance stems from negative beliefs of (majority female) workers about the abilities of female supervisors, which then corrected itself over time the more they were able to work with their manager.

Adopting productive management practices and improving the managerial skills of supervisors can significantly increase worker productivity and firm profitability. Emerging evidence demonstrates that improving managerial quality can generate considerable productivity increases. Some supervisory skills training programs have improved labor relations and narrowed the gender gap in managerial leadership. However, changing practices may face resistance from workers and result in adverse short-term effects on productivity. In addition, firms must design programs that actively fit their needs, given the size and skill level of the managers they hire.

4. Why Don’t Firms Invest More in Workers?

Given the documented causal impacts of worker investments in various types of productivity and, in many cases, the documented substantial returns on such investments, why is firm investment in the workforce, in general, quite low? We review several potential explanations below. This area of inquiry requires more rigorous empirical investigation to understand which barriers to adoption are most salient in various contexts.

4.1. Information Frictions

A lack of worker investment within a firm may be explained by a lack of knowledge or awareness of how vital worker investment is and the impacts of this on workers' well-being and firm productivity. Such misconceptions lower the perceived value decision-makers have surrounding worker investments. This idea has received some recent attention in the public sector. Hjort et al. (2021) study the adoption of best practices by Brazilian mayors in the policy-making process. They find that mayors are willing to pay to learn the results of impact evaluations and incorporate these findings into their knowledge base when making policies. Informing mayors about research on the impacts of reminder letters for taxpayers increases the probability that their towns implement such a policy by ten percentage points, suggesting that information frictions are quite salient in the non-adoption of best practices identified by research.

Sometimes, even if decision-makers are aware of necessary or helpful information, friction between agents may lead to an inefficient flow of information between parties, leading to information friction. Improving this information friction through improved communication flows between workers, for instance, can help firms institute crucial investments for their well-being. In Sandvik et al. (2020), researchers studied call center workers in the U.S.,
running an RCT to test whether improving knowledge flow across workers improved productivity. Workers were assigned to random meetings with their peers in which they discussed sales techniques. The results showed that the sessions significantly improved employee performance as measured by revenue per call. In Menzel (2021), the researchers ran a similar experiment with three Bangladeshi garment firms. Supervisors overseeing a "non-first style" (a style of garment already produced elsewhere in the factory) production line were randomly required to meet with the supervisor of the original line. As a result, productivity on the first day of the new line was higher. These results show that information frictions may result from information blocks due to a lack of knowledge or an incorrect valuation made by a firm; sometimes, improper communication pathways within a firm may contribute to or exacerbate this problem.

4.2. Risk Aversion

It has long been theorized that worthwhile investments may be forgone if there is uncertainty in the value of investments and decision-makers are risk-averse, especially in developing countries where the consequences from an unfruitful investment may be disastrous (Stiglitz 1969; Banerjee 2004; Banerjee and Duflo 2011; Mobarak and Rosenzweig 2012; and Katreniak et al. 2023; for a recent review). This might lead firms to classic under-experimentation (as compared to a risk-neutral decision-maker) with investments in workers that might, on average, be very profitable. For example, Mobarak and Rosenzweig (2014) and Karlan et al. (2014) randomly give micro-enterprise farmers access to insurance in India and Ghana, respectively, mitigating their risk to weather shocks, and find that they invest in higher-yield but riskier crops. Studying small and medium enterprises in Vietnam, Do and Bui (2022) found a positive correlation between risk-loving attitudes and the likelihood of investing in human capital training for employees. This is similar to under-investment in other realms, for example, in decisions to engage in temporary migration (Bryan et al. 2014).

4.3. Limited Attention

Managers typically have a limited amount of attention that they can allocate toward activities within their span of control. Managerial inattention could impede the ability of the firm to either invest or implement effective strategies that seek to further worker productivity. A growing body of evidence supports the general idea of managerial inattention being salient for productivity within firms. For instance, in the research highlighted above, Adhvaryu et al. (2022a) find that more attentive managers (i.e., managers who monitor frontline workers more frequently), or perhaps managers whose idiosyncratic attention costs are lower, are more likely to relocate workers in response to adverse worker-level productivity shocks from pollution exposure and are better able to mitigate
productivity losses on their lines. Similarly, in Bandiera et al. (2020), working with CEOs in six different countries, including India, the authors show firm performance is positively correlated with the amount of time CEOs spend in high-level, multi-function meetings rather than production activities. Finally, Lemos and Scur (2019) show that family-operated firms, for whom the attention of top management is often stretched thin, given that the firm control is limited to family members, display less adoption of structured management practices and worse firm performance. These various studies suggest the important role that scarce managerial attention can play in reducing productivity, perhaps through the reduction of attention on profitable investments in workers.

4.4. Misalignment of Incentives

Conflicting interests at varying levels of the firm hierarchy may cause friction in adopting profitable practices, including investment in workers. For example, Atkin et al. (2017) introduced a new technology to make soccer balls more efficiently to 35 firms in Pakistan. Only six firms adopted the technology 15 months into the trial. Through conversations with employers and workers, they found that while the new technology would have reduced waste and sped up production (both parties knew this), workers found ways to discourage adoption because their incentives were not aligned with greater firm performance. The researchers conducted a second experiment to address this misalignment: employees received a bonus of a month's salary if they demonstrated the productivity benefits of the new technology in the presence of their employers. This generated a significant increase in adoption by firms, suggesting that a conflict of interest within the firm had been at least partially responsible for the initially slow adoption.

Similarly, in a study discussed earlier related to managerial training (Adhvaryu et al. 2023b), middle managers were asked to nominate their supervisors for the managerial training program. Randomization was then done within nomination ranks, thus allowing for the identification of heterogeneous effects by middle manager nomination categories. The researchers found that supervisors who were highly recommended by their superiors actually had zero treatment effect on productivity, but a large treatment effect on retention. Low-recommendation supervisors showed exactly the opposite effects: they had large improvements in productivity but almost no impact on retention. The researchers made sense of these results by elucidating a wedge between the incentives of the firm’s upper management, which cares about maximizing firm productivity alone, versus middle managers, who care about productivity but also have high personal costs to supervisory turnover in terms of finding and onboarding replacements. Thus, recommendations deviate from the optimal in terms of productivity gains because supervisor retention is particularly valuable to middle managers. This divergence in incentives could lead the firm to conclude that supervisory
training is not very effective (if highly recommended supervisors were alone given access to the training), and generate non-adoption of an otherwise very profitable investment.

4.5. Turnover Erodes the Value of Investing in Workers

Becker (1964) famously contended that firms in perfect labor markets should not invest to train their workers in general skills. This might lead to under-skilling in equilibrium if, for example, workers are very credit-constrained, as they might be particularly in low-income country contexts. Becker distinguished the skills a worker can learn on the job and the different valuations of these skills in the labor market as either specific or general. General skills are defined as those that are useful to all employers. In contrast, specific skills only increase a worker's productivity in their current job. He remarked that when labor markets are perfectly competitive, workers would be the sole beneficiaries of the improvements in their productivity, i.e., if training increased marginal productivity, the labor market would ensure that firms would have to pay these workers more, or they would leave and earn more elsewhere as a result of their increased marginal products. This would mean the return to the firm from training in general skills would be zero. Thus, there is no economic incentive to invest in workers’ skills from the firm’s point of view when labor markets are perfect; workers would have to invest in their own skills to improve their productivity. Under different assumptions of frictions in the labor market (in the form of information asymmetry, slow employer learning, or search frictions), however, as Acemoglu and Pischke (1999), Autor (2001), and others have pointed out, there could in equilibrium indeed be a wedge between workers’ wages and marginal products, setting up a rent from general training for the firm. Therefore, under-investment in worker skills could arise in equilibrium if labor markets were fluid enough.

References


To view the entire video of this IPF session and the General Discussion that ended the session, please scan this QR code or use the following URL

https://youtu.be/BORqUv0jaKE
Comments and Discussion*

Chair: Rana Hasan
Asian Development Bank

Kanika Mahajan
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It was a pleasure to read this paper. I first summarize the main findings and discussion in the paper and thereafter offer some suggestions.

The authors carefully uncover the levels and trends in labor productivity in the Indian manufacturing sector. They first show that India’s labor productivity is three-fifths of that of the US even after purchasing power parity adjustment. Not only has this been low historically, but it has also been declining over the last decade, particularly before the COVID-19 pandemic, as noted by the authors. Clearly, this does not bode well for India’s manufacturing sector. The geographical variation in labor productivity is also intriguing—States in western and central India tend to have the highest average labor productivity—showing that spatial variation perhaps needs greater attention in future work.

Next, the authors show a positive association between worker emoluments in a firm, including the value of benefits provided by the employers, and labor productivity. They contend that this dimension of possible productivity enhancement through greater employer investment in workers in manufacturing, has not received much attention as compared to factors like capital misallocation and regulatory requirements.

This provides the primary motivation for this paper to further examine the nature of investments which have been shown to increase worker output. The emerging evidence discussed in the paper regarding interventions which can increase labor productivity is extremely informative and relevant for businesses when deciding how to invest in increasing worker productivity. This directly extends the copious and excellent work done by the authors over the past many years on what works to increase worker productivity in firms.

The authors begin by noting four broad types of interventions which have been tested in the literature—improving soft skills of workers, providing voice to workers to improve workplace relationships, managerial quality, and

* To preserve the sense of the discussions at the India Policy Forum, these discussants’ comments reflect the views expressed at the IPF and do not necessarily take into account revisions to the conference version of the paper in response to these and other comments in preparing the final, revised version published in this volume. The original conference version of the paper is available on NCAER’s website at the links provided at the end of this section.
environmental conditions. Studies evaluating the impact of soft skills find a 7-20 percent increase in worker productivity, as measured through ratings, output, and profits. Interestingly, these studies find that targeting soft skills at a younger age can increase test scores and reduce school dropout too. These findings show that these interventions in school can have a broader impact on labor productivity when these individuals enter the labor market. Importantly, these have been shown to be more beneficial for women who gain access to negotiation skills and confidence through such trainings.

The second strand of research discusses the impact of improved voice of workers in terms of having them evaluate their managers. This reduced worker turnover though it had no impact on productivity or profits. The authors then discuss the findings from their studies in India. In one study, workers randomly filled an evaluation form for their supervisors and about their overall job satisfaction, in the aftermath of a small wage increase. In the second study, the workers were randomly registered on a platform that allowed them to send anonymized feedback to the HR department. Both studies show a decline in quit rate or reduced turnover—factors that managers really care about—but no effect on productivity.

The third literature examines the impact of improving work physical environment on worker productivity. For instance, studies that randomly assign workers to more ambient temperatures and switch heating sources from incandescent bulbs to LED bulbs, which decreases the heat generated, find an increase in worker productivity and firm profits. Thus, managing environmental risks is important for increasing worker productivity.

The last set of studies examine the role of improving managerial quality. Here, the nature of intervention is shown to be important. Greater provision of trainings, which improve supervisor–worker relations by imparting effective leadership and communication skills, improves workers’ satisfaction when direct supervisors are trained. On the other hand, training higher order supervisors increases firms’ profits and productivity too. Another training focused on teaching record-keeping and storage practices found expansion of production activities and a decline in the inventory of firms, with overall growth of firms, three years after the intervention. Increasing information flow among workers, by randomly having supervisors have their experienced workers interact with the new workers was also shown to increase worker productivity of new workers.

The authors end with the question about why despite high returns to investment in workers, firms do not seem to invest in these productivity-enhancing interventions. They propose the following four possible factors behind this—lack of information among firms about the benefits of investing in workers, potential risk in returns which accrue to the firm after such investment, limited attention span of managers which may lead to under-investment by them in workers, and higher turnover risk when workers are better trained.
They discuss studies which show each of these possible reasons behind under-investment in workers by firms.

My suggestions are along four dimensions—motivating the human capital investment channel in explaining cross-country productivity differences, considering, or discussing the role played by firm size in explaining the differences, extending the empirical strategy to measure the association between worker investment and labor productivity in India, and synthesizing the existing evidence presented from other studies on interventions into cost-benefit analyses.

**Motivation: Importance of Human Capital Investment in Explaining Cross-Country Labor Productivity Differences**

The authors begin by noting the labor productivity differences between India and the US, and then delve into the role played by human capital in possibly explaining it. A discussion on existing evidence around other factors, which can also possibly contribute to the productivity difference—technology and physical capital—would enrich this discussion further. Caselli (2005), Hall and Jones (1999), and Klenow and Rodríguez-Clare (1997) discuss the role played by technology or Total Factor Productivity (TFP) in explaining productivity differences across countries. But Acemoglu and Dell (2010) find that human capital differences contribute almost half of the variation in productivity in the Latin American countries.

Hall and Jones (1999) further delve into the social capital channel explaining the differences in technology and human capital productivity across countries. A higher level of social capital—defined as “lower levels of corruption, risk of expropriation, and government repudiation of contracts, while having higher levels of bureaucratic quality and law and order”—is shown to increase investments in education and technology. This is because of reduced misallocation of resources. Restuccia and Rogerson (2008) and Hsieh and Klenow (2009) for India show that TFP variation plays a major role in explaining differentials and the TFP in countries like India is lower because of misallocation of capital within the country. This can result from policies which distort incentives for firms to access credit or regulations that inhibit access to capital based on marginal productivity of enterprises.

Thus, apart from human capital productivity, other factors can also play a role in explaining the lower labor productivity in India. Notably, most studies rely on income per capita to measure labor productivity and few like Hsieh and Klenow (2009) use data specifically from Indian manufacturing enterprises. Nonetheless, a motivating discussion on why human capital differences—which are not accorded as much importance in the literature in explaining the cross-country differences—may be an important contributor in explaining the
variation will be informative for readers before the micro level evidence on how human capital can be increased is discussed.

The Role Played by Firm Size

Second, it is well known that firm size in India is much smaller than in the developed countries. For instance, 95 percent of manufacturing enterprises have less than ten employees, and 77 percent of manufacturing employment is in enterprises with less than ten employees (Sixth Economic Census, 2012-13). On the other hand, this figure stands at less than 10 percent for the OECD countries. The reasons behind the small firm sizes can be regulatory. From an accounting perspective, if one were to allow firm size to be similar in India versus the US, how much would the labor productivity differences between the countries remain unexplained? One way of implementing this could be re-weighting the ASI enterprises so that firm size distribution matches that of the US.

The link between firm size and labor productivity can be explained through many channels—smaller firms have lower access to capital and are less likely to adopt new technology. They are also less likely to invest in training, managerial quality, or mitigating environmental factors due to size constraints. In a recent paper, we show that bigger firms are more likely to offer on-the-job training and other benefits that workers value (Chakraborty and Mahajan, 2023). Thus, discussing this channel more has direct policy implications for providing incentives to increase firm size in India. A discussion on what proportion of firms make any investment in employees would also be a useful statistic for the discussion on why less firms invest in workers.

Identification Strategy

Third, using data from the Annual Survey of Industries 2019-20, the authors show that increased worker emoluments (wages and benefits) are associated with higher labor productivity. Since wages are affected by labor productivity as well, my suggestion would be to exclude them from the measure of emoluments. This exacerbates the endogeneity concerns in their regression framework. While they duly accept reverse causality between wages and labour productivity, some effort can be made to mitigate this.

One, authors can use only data on expenditures on benefits by the employer—“direct expenditure on maternity, crèches, canteen facilities, educational, cultural and recreational facilities; and grants to trade unions, cooperative stores, etc., meant for employees”—as a measure of worker investment. They can exploit the panel structure of the data and use firm fixed effects to reduce firm-specific unobserved heterogeneity.
Synthesis of Findings from the Interventions on What Increases Labor Productivity

The authors discuss various interventions—soft skills training, increasing information flows between workers, providing voice to worker concerns, improving workplace climate and direct environmental conditions in which workers operate as well as improving the managerial quality by training—and the magnitude of their impacts on firm outcomes. While the depth of the discussion is extremely informative, what may be further useful for firms or for policymakers who launch various initiatives to increase firm productivity is a cost-benefit evaluation summary of these interventions.

To conclude, the paper discusses the extremely relevant and important topic of lower labor productivity in India. It suggests ways to improve it through increased human capital investment by firms. With additional motivation of why this channel is important in explaining differences in cross-country labor productivity, it has the potential to influence decision-making by both firms and governments in India.

References

1. Introduction

This is a thought-provoking paper that connects the phenomenon of the slowdown in manufacturing productivity in India at the macroeconomic level and its wide dispersion across the country, to a hypothesis at the microeconomic level: this may be due to firms insufficiently investing in their workers. The paper must be praised for taking on an important policy-relevant question, offering an interesting hypothesis, and providing both macro- and micro-level evidence in support of it.

For the macro part of their argument, the authors use data from the Annual Survey of Industries (ASI) and define productivity as revenue per worker and ‘emoluments’ as the measure for firm investment in workers. ASI defines emoluments as the sum of wages and salaries, bonuses, employer’s contribution to Provident Fund, and various perks, namely, all goods and services provided to workers free of cost or at a subsidized rate ranging from healthcare to festival bonuses.

The paper documents that the growth rate of productivity shows a sharp downward trend since 2015. It shows that there is a big dispersion across States and industries within India, and that productivity is strongly correlated with firm investment in workers, even when we stick to comparing firms within the same industry and located in the same state.

The paper is very careful in not making any causal claims about the link between productivity slowdown and investment by firms in worker productivity at the macroeconomic level. Nor does it make any grand claims that it is a magic bullet and that if firms start investing in the productivity of their workers, the slowdown in productivity growth might be reversed at the macroeconomic level. In fact, the paper explicitly notes that unobserved choices of the firm may be correlated with both wage and other forms of benefits to workers, as well as productivity from the macro-level evidence they provide, and this forms the basis of the paper turning to micro-level evidence, which is much more rigorous from the causal point of view. It provides a very lucid and engaging review of an emerging literature that provides causal micro-level evidence on firm investments in worker productivity or factors that facilitate these investments on firm productivity. This evidence is mostly based on Randomized Control Trials (RCTs) drawing on the work of the authors as well as others. The examples of factors that are experimentally varied are soft skills of workers, giving workers more voice, improving the physical environment of workers, especially regarding extreme heat and pollution, and managerial quality. The evidence all points to net gains from investment in these dimensions for firms in terms of productivity.
This naturally brings up the question: Why don’t then firms invest in their workers? The paper discusses several reasons, which are mostly microeconomic in nature, focusing on an individual firm’s incentives. They include information frictions (firms may lack awareness of the benefits of investing in workers), risk-aversion (uncertainty about returns and outcomes might discourage investment), limited attention of managers (managers might not focus on long-term investments), and misalignment of managerial incentives (even if beneficial for the firm, managers may not prioritize worker investments as their interests and the firm’s overall profitability may not be aligned due to agency problems). The paper ends by discussing a more macroeconomic channel as to why firms may not optimally invest in the productivity of their workers that goes back to Gary Becker’s (Becker, 1962) insight that to the extent that these productivity gains for workers are ‘portable’, which would be the case for general skills, firms do not recoup the benefits from these investments due to the presence of worker turnover. A more recent literature in Labour Economics, such as the paper by Acemoglu and Pischke (1999) that the paper cites, has shown that even in the presence of labor market frictions, to the extent labor markets are fluid enough, the problem of firms under-investing in worker skills may result.

I have two sets of interrelated comments on the paper, presented in Sections 2 and 3 below. In Section 2, I try to place the argument in the context of the overall macroeconomic environment of India. A natural question that arises is whether firms are not investing in workers because the overall macroeconomic environment has been stagnant, in general, and, for the manufacturing sector, in particular. Therefore, the paper’s macro-level evidence that finds a strong correlation between firm investment in workers and productivity could be due to reverse causality—lower productivity implies lower investment in workers. In Section 3, I suggest a theoretical explanation that is consistent with both the macro- and micro-level findings of the paper, namely, that firms invest less in workers when labor markets are slack since they can afford to do it as the outside options of workers are not great, whereas when labor markets are tight, firms must invest in their workers to retain them and stay competitive. In Section 4, I make some concluding remarks about a very interesting research agenda that this paper points to.

2. Placing the Argument in the Context of India’s Overall Economic Trajectory

I would like to place the argument presented in the paper in the context of the macroeconomic environment in India in the recent past to make two points. Could there be an interpretation that reverses the line of causality that the authors posit, namely, could declining productivity (as measured by revenue per
worker in the paper) be driving diminished investment in workers? This could be the case if there are general factors operating at the macroeconomic level driving an overall decline in investments of all kinds by firms due to diminished profitability, which would show up as diminished productivity.

There was a clear deceleration of the growth rate of per capita income over the last decade compared to the previous one (Nagaraj, 2023). If one looks at growth since 2000, the average growth rate was lowest in the last five years (excluding the pandemic year) as compared to the previous five-year intervals and the signs of growth slowdown had become apparent before the pandemic. This was particularly noticeable for the manufacturing sector, with the growth rate steadily declining since 2015, and hitting negative numbers in 2019. If we leave aside the pandemic year and the recovery year following it, for the very last year for which we have data, namely, 2022-23, the annual growth rate of value added in manufacturing was 1.34 percent, the lowest among the other sectors. Signs of a generally stagnant macroeconomic environment in manufacturing is reflected in the steady decline in the investment-to-GDP ratio over the last decade after it had grown for three decades. The share of manufacturing in total output as well as employment has been stagnant.

There are several possible explanations for the stagnation surrounding the manufacturing sector. There could be demand-side factors that are constraining the market size and incentive of firms to invest in capacity and productivity due to rise in inequality (for example, Ghatak, Kotwal, and Ramaswami, 2020). There could be supply-side factors that have to with greater regulation, more stringent enforcement of existing regulations, macro-level shocks like demonetization, and introduction of GST that could also reduce the investment incentives of firms. It is beyond the scope of this discussion to delve deeper into the causes behind it. However, given the evidence on the general signs of slowdown in the manufacturing sector, it is reasonable to ask whether the direction of causality that the paper posits at the microeconomic level—namely, investment by firms in workers may lead to gains in productivity—could, in fact, be running the other way around, namely, because of the stagnant macroeconomic environment facing the manufacturing sector, the profitability of undertaking investments of any kind by firms is down. If the firm’s production function has a multiplicative productivity parameter , then a fall in would lead to a reduction in all its input (including investment) choices. In other words, firms may be doing less of many other things (investing in plants and machinery, adopting new technology, marketing, seeking export markets) and that raises the question: How important is the specific component that the authors focus on (investing in workers) in explaining overall low productivity levels? Reverse causality is not just an econometric concern here but could be economically of first-order importance, and so, while looking at this micro-channel is useful, it is also important to keep the underlying macro-factors in mind.
3. Factors Influencing Firms’ Investment in Workers

I want to make a constructive suggestion about how the core argument of the paper—namely, the investment by firms on workers may boost productivity—can be formalized using a simple microeconomic argument about the incentive to invest by firms and how it depends on the economic environment. In particular, we will focus on the state of the labor market as that determines the outside option of workers, and how firms decide on how much to invest on their workers partly depends on whether the labor market is tight or slack, because that determines the likelihood of turnover.

In the spirit of the argument presented in the paper, let the firm’s productivity parameter be a function of investments in workers, denoted by \( x \). Let the relationship be described by a function \( \theta A(x) \) which is increasing in \( x \) but subject to diminishing returns, and \( \theta \) is a multiplicative parameter capturing all factors at the macro, industry, and firm level that affect its productivity. Let the cost of undertaking this investment be denoted by \( c(x) \) which is increasing and is subject to increasing marginal cost. Let \( w \) be the wage paid to a worker. For simplicity, let us assume that the worker supplies one unit of labour. Workers have an outside option \( \bar{u} \) which captures the expected payoff from finding another job, which depends on the probability of finding an alternative job \( p \) and the payoff conditional of finding such a job, \( u \). In other words, \( \bar{u} = pu \). Let \( b(x) \) be the direct gains that the worker receives from these investments, which reflects their payoffs from staying in this job in addition to receiving a wage. This would, for example, be the gains from having better work conditions or emoluments. One can also think of anything that reduces the disutility or discomfort of working conditions as a benefit.

The participation constraint (PC) for the worker, as is standard in models of the labor market, says that the worker’s valuation of the firm’s offer of wages and other benefits of the job must not fall short of the worker’s outside option, or else he or she will quit:

\[
w + b(x) \geq \bar{u}.
\]

The firm’s objective function is to maximize its profits:

\[
\pi(x) = \theta A(x) - c(x) - w
\]

by choosing \( w \) and \( x \) subject to the participation constraint \( w + b(x) \geq \bar{u} \). If the participation constraint is binding, then we can substitute \( w = \bar{u} - b(x) \) is the firm’s objective function and find the following condition for profit-maximization:

\[
\theta A'(x) + b'(x) = c'(x)
\]

In other words, the firm is setting the marginal gains from the investment to itself and to the worker equal to the marginal cost, and that gives an efficient level of investment. The intuition is, if firms can cut wages to adjust for the additional
benefits workers receive due to these investments, they effectively internalize
the benefits from the investment that goes to the worker and therefore, invest
at an efficient level. However, if due to labour regulations or efficiency wage
considerations (whether due to nutrition-based reasons or reasons of providing
a wage premium to discourage shirking), wages cannot be cut below a certain
lower threshold, then this argument does not work. Suppose even when wages
are at the minimum possible level $w$, workers earn more than their outside
option $\bar{u}$. This is a plausible scenario in a labor-surplus economy. In that case,
the participation constraint could be slack even if $x$ is low (say, $x=0$) and $w = \bar{w}$, namely, $w + b(0) > \bar{u}$. Then the firm’s investment decision will be given by

$$\theta A'(x) = c'(x)$$

that is, they will under-invest as compared to tight labour markets.

Observe that we took a very simple model that does not consider dynamic
considerations that the existing literature referred to earlier and discussed in
the paper has focused on. We also ignored, among other things, externalities,
general versus specific investment, and behavioral/learning issues. In our
simple static model, we saw how labor market conditions, including tight or
slack markets, to the extent it determines whether participation constraints are
tight or slack, can influence investment decisions by firms. If labor markets
are tight, firms will invest more in workers even if some of the benefits accrue
to workers and cannot be directly captured by firms. But if labor markets are
slack, employed workers earn a ‘rent’ since getting another job is not easy,
firms will only look at their profits in making such investments and ignore the
positive impact on workers, thereby leading to under-investment.

We argue that given the overall stagnant environment in the manufacturing
sector that we described earlier, it is unlikely that the labor market would
be booming. Indeed, data on employment suggest that since 2012, formal
manufacturing employment as a percentage of the total employed persons has
hovered at around 5 percent. Moreover, the overall trends in the labor market
(see Ghatak, Jha, and Singh, 2024, for a review) do not indicate any significant
rise in job creation or increase in real wages. Therefore, the environment is
more likely to resemble a situation where the participation constraint of workers
is slack, as opposed to tight, and that would imply lower investment by firms.

4. Conclusions

To sum up, the paper highlights the relationship between worker investments
and productivity growth in the context of stagnating productivity in the
manufacturing sector in India and offers an interesting channel that could
be responsible, namely lower firm investment in worker productivity. It also
connects macro-level evidence on stagnant manufacturing productivity and
variation in productivity across States to the measure of investment in worker productivity from ASI data to micro-level evidence drawn largely from randomized experiments to suggest methods for enhancing firm investment in worker productivity.

The paper presents findings from a very interesting research agenda about the relationship between firms’ investment in workers and productivity. None of the points I raised suggests that the arguments that the paper advances are incorrect. Rather, they suggest that there could be other forces at work, and one would need more evidence to distinguish between them and evaluate their relative importance. Moreover, given the richness of the experimental evidence that is already available, one can try to look for evidence on the alternative mechanisms at work and if the existing data does not permit nailing down the mechanism as rigorously as one would want, it suggests a very promising research agenda that can provide further insights on the relationship between firm investment in workers and productivity.

References


General Discussion

Pravin Krishna initiated the discussion by asking about the interventions that have been investigated. Specifically, he wanted to know whether the authors had analyzed the distinction between skill enhancements that pertain exclusively to individual workers and those that are more aligned with the needs of the employing firms. He also asserted that if companies invest in workers with a focus on cultivating skills uniquely suited to the operational demands of the firm, these firms could internalize the advantages stemming from these skill enhancements, thereby mitigating possible challenges. An alternative scenario could be one in which investments are directed towards nurturing
more generalized skills among workers. An intriguing observation, arising from one of the studies mentioned by the authors, was that despite a noticeable upswing in productivity, the anticipated increase in employee turnover did not materialize. This anomaly is especially perplexing given a situation wherein worker compensation falls below marginal productivity.

Devesh Kapur highlighted the trends in the organized sector, particularly services and Information Technology (IT), where the emphasis is ostensibly on investing in worker training, despite high turnover rates in the two sectors. Shifting focus to the manufacturing sector, he drew a cross-country comparison, noting that Germany and Japan stand out for instituting industry councils with clearly defined roles in their respective manufacturing sectors. These councils serve as platforms for disseminating information among member organizations, akin to the Confederation of Indian Industry (CII) in India. An analysis of the functioning of the German and Japanese councils could also serve as best practices for their counterparts in India. He also alluded to research undertaken during the 1920s and 1930s, which compared the productivity of cotton textile mills in India with their Japanese counterparts. This analysis revealed a considerable productivity gap, indicating the better performance of Japanese mills, as a result of which Indian companies were losing their market share to their Japanese counterparts. He finally suggested that an analysis of the impact of unions and their role in shaping both firm incentives and worker behavior in India’s manufacturing sector, was missing in the paper. The establishment of the National Productivity Council by the Indian Government is aimed at addressing these concerns and disseminating best practices among firms.

Ratna Sahay commented that the paper could have examined distortions in India’s labor market arising from stringent labor laws and intentionally maintaining small firm sizes to ensure that the latter do not fall under the ambit of certain labor laws. She also questioned whether soft skills and managerial practices were the primary drivers of China’s manufacturing success, or if incentives and enforcement mechanisms had also played an equally crucial role, implying the importance of both micro- and macro-level factors in shaping policies for the manufacturing sector.

Karthik Muralidharan suggested that the reason behind Becker’s concept of employees not quitting after acquiring skills could be due to their inability to effectively demonstrate those soft skills to external parties, especially skills that are not conventionally assessed. He also remarked that the work in the paper seems to be on the cutting edge of discovery, reminiscent of the advent of management consulting in the 1920s based on micro improvements to practices on factory floors. He also raised the following questions: Are other organizations or entities engaged in similar studies of workplace productivity? Do practitioners highlight such concepts which are then validated by researchers through testing? He further stated that 10-20 additional similar studies could help serve the broader public interest by influencing educational curricula in
business schools and other academic institutions. Reiterating Ratna Sahay’s suggestion that soft skills alone may not have been the driving force behind the success of China’s manufacturing sector, he argued that recent studies from China highlight the positive impact of giving workers a voice to enhance their productivity.

Seema Jayachandran wondered whether the subject aligns with government policy or industrial policy. She stated that the paper highlights the challenge of treating these ideas as public goods. She also flagged the issue of skill transferability, and the differentiation between soft skills and work condition-related skills, as well as the need for investing in other elements such as equipment upgrades to boost productivity in the manufacturing sector.

Rana Hasan commented on the perplexing issue of high labor productivity in some States such as Madhya Pradesh in contrast to lower productivity in the Southern States despite the prevalence of industries like Foxconn, Pentagon, and the auto industry in States like Tamil Nadu, Karnataka, and Telangana. The inclusion of regular and contract workers in the ASI data could be another reason affecting the firms’ incentives to invest in training. It is also worth exploring if the presence of a few large firms like Cipla or Eicher Volvo is driving the higher productivity in Madhya Pradesh. This leads to questions about incentives, middle management, and the suitability of India's regulatory environment for smaller firms. He also wondered about the possibility of alternative methods for enhancing productivity beyond the proposed 12-hour shifts.

Maitreesh Ghatak pointed out that the Lewis model of rural-urban migration emphasizes migration despite wage premiums. This insight highlights the tension between the macro Indian scenario and the cutting-edge micro findings presented by the authors, which plays out in the broader context of rural-urban migration dynamics. He also stressed the need to address the following key question: How can firms be motivated to seek improvement and self-assessment, especially in labor-surplus economies where employee satisfaction might not be a priority? The transient nature of macro-shocks also impacts these challenges. He noted that understanding the frequency at which firms in the manufacturing sector experience failure provides a nuanced perspective on investment tendencies. Hence, if there is a strong aversion to failure in a particular firm, the latter may adopt a cautious approach, resulting in under-investment and failure to exploit potential opportunities for growth.

Ajay Mahal outlined the significance of a different model wherein training is provided by an external partner without a direct cost to the firm. This strategy could help in enhancing workers’ skills and ensuring their retention by leveraging external expertise. Incorporating this external training model into the broader discussion can provide a more comprehensive view of the various strategies’ firms employ to balance skill development, workforce retention, and overall productivity.
Prabhat Barnwal acknowledged that the authors had touched upon the crucial interplay between training programs, promotions, and the specific organizational structure of firms. In case of the existence of a significant number of frontline workers and only a few managerial positions in an organization, the decision to promote a few workers could foment tensions or perceptions of favoritism among the workforce. On the other hand, the complementarity between trainings and promotions can be used as an advantage by firms, as the prospect of career advancement can act as a powerful incentive for workers to actively participate in training initiatives. Firms too can benefit by imparting training to workers, which would equip them to handle greater advanced responsibilities, and create a skilled and motivated workforce. However, workers are more likely to value and actively engage with training only if they perceive a clear connection between the skills they acquire and their potential for personal growth and career advancement. This underscores the importance of charting comprehensive human resource strategies encompassing training, career development, and effective communication to create an environment wherein both the firms and their employees can thrive.

The session video and all slide presentation for this IPF session are hyperlinked on the IPF Program available by scanning this QR code or going to: https://www.ncaer.org/IPF2023/Agenda.pdf
ABSTRACT This article discusses son preference in India, including both greater investment in sons and the fertility preference for sons. Regarding differential investment, I focus on child health and show that gender gaps in inputs and outcomes have narrowed in recent years. Nonetheless, girls remain disadvantaged in important ways, and making health services free is unlikely to be enough to close these remaining gaps. In addition to gender gaps, there are also stark health gaps between eldest sons, whom parents favor, and other sons. Fertility preferences likewise center on eldest sons. The desire to have at least one son—who can fill that eldest son role in the family—drives the skewed sex ratio, and this preference shows little sign of abating. In fact, the downward trend in family size is exacerbating how the desire for a son translates into sex-selection. Families’ quest for a son also imposes collateral damage on sisters’ health. The policy challenge, particularly around reducing the desire for sons, is large. Empowering women is not a panacea, and offering financial incentives to have daughters risks further concentrating girls in poorer families. While we do not know which policies will erase the disadvantages girls face, some that might help are public pensions as an alternative to old-age support from sons, increased delivery of health services through schools, and norm-change interventions that aim to increase the intrinsic value that Indian families place on girls.

Keywords: Son Preference, Sex Ratio, Son Bias, India

JEL Classification: J13, J16, O15

1. Introduction

This article summarizes some key facts and recent evidence on son preference in India. I define son preference to encompass both greater investment in sons than daughters and a fertility preference to have sons. These two dimensions of favoritism have connections, yet the root causes, trends, and policy solutions differ in important ways. In my discussion of gender-biased investments, I focus on those related to health.
I organize the discussion around ten facts:

1. Gender gaps in child health inputs and outcomes have narrowed in recent years.
2. Nonetheless, girls remain disadvantaged in important ways.
3. Unfortunately, making health services free might not be enough to close the remaining gender gaps.
4. In addition to gender gaps, there are also stark health gaps between eldest sons, who tend to be favored, and other sons.
5. The desire to have a son—specifically to fill the eldest son role in the family—is what drives the skewed sex ratio.
6. Unlike gender gaps in child investment, the desire to have a son shows little sign of abating.
7. In fact, the downward trend in family size is exacerbating how the desire for a son translates into sex selection.
8. Families’ quest for a son also imposes collateral damage on sisters’ health.
9. Empowering women is not a panacea that will solve the problem of son preference.
10. Offering financial incentives to have daughters risks further concentrating girls in poorer families.

I close by discussing policies that seem promising to reduce son preference, in particular the desire for sons. While we do not know which policies will erase the disadvantages girls face in India, some that might help are public pensions, which serve as an alternative to old-age support from sons, increased delivery of health services through schools, and attitude- and norm-change policies that aim to increase the intrinsic value that Indian families place on girls.

2. Gender Gaps in Health Inputs and Outcomes

One dimension of son bias is providing more inputs, such as food and health care, to sons than daughters. Such behavior by parents could arise if they intrinsically care more about sons than daughters or because they perceive the instrumental benefit—the financial return to the investment in the form of higher adult earnings, for example—to be higher for males. The returns hypothesis can be broken down further. There might be lower returns for girls after accounting for the benefits that accrue to everyone, perhaps because labor productivity is less dependent on health for the type of work that adult women tend to do. Alternatively, returns could be the same overall, but lower from the parents’ point of view, for example, because of India’s system of patrilocal exogamy whereby females join their husbands’ families upon marriage.
It is useful to benchmark child health inputs and outcomes in India against other countries, first, because some gender differences in outcomes are biological so parity does not always correspond to lack of discrimination, and, second, to the extent there is discrimination, it is useful to understand if it is related to India’s stage of economic development or is anomalous among countries with similar GDP per capita. India being like other countries points to a full-returns-to-investment explanation, while India being anomalous is more consistent with preferences or the investment distortions created by exogamy.

Most of the original data analysis in this paper uses India’s National Family Health Survey (NFHS), which is part of the Demographic and Health Survey (DHS) series of surveys fielded in low- and middle-income countries. The five rounds of the NFHS were conducted in 1992-93, 1998-99, 2005-06, 2015-16, and 2019-21. The surveys collect information from a representative sample of women aged 15 to 49 years, with detailed data on fertility and maternal and child health. I show comparisons both across NFHS rounds and between India and other countries.

The first fact is a welcome one:

2.1. Gender Gaps in Child Health Inputs and Outcomes have Narrowed in Recent Years

Figure 1 shows the girl-boy ratio of receiving at least four of the following nine vaccines recommended for infants: BCG, DPT doses 1 to 3, polio doses 0 to

**Figure 1. Female-male Ratio of Vaccinations Across NFHS Rounds**

Unit: Y-axis, no unit; it is a ratio

3, and measles. Here, as throughout the article, I construct variables so that a higher value is a better outcome and present female-male ratios; a higher value represents a relative improvement for girls. As seen in the figure, there was a gender gap in vaccinations that favored boys in the 1990s and 2000s, but it has closed.

Figure 2 shows a similar improvement for infant survival, i.e., the share of children who survive until at least their first birthday, using births within five years of the survey. Here, I compare India to other countries, plotting the female-male ratio of infant survival versus the country’s GDP per capita (in purchasing power parity terms), where each point represents a country. India’s improvement over time can be seen by contrasting the top panel, which uses NFHS-3, with the bottom panel, which uses NFHS-5. The comparison group for NFHS-3 includes other DHS data sets collected from 2004 to 2007, while the comparison group for NFHS-5 includes DHS data sets collected from 2016 to 2022.1

The gray line in Figure 2 marks the average female-male infant survival ratio for the comparison countries. The ratio of 1.01 means that the survival probability is 1 percent higher for girls than boys elsewhere. This advantage for girls is consistent with the well-known biological fragility of male infants (Kraemer 2000). The top panel in the figure shows that for children born in the early 2000s in India, girls had an abnormally low survival rate below 1, equivalent to “excess mortality” for 1.6 out of every 100 girls born. The bottom panel in the figure shows that while India is still below the international average for low- and middle-income countries, it has closed most of the gap.

One plausible reason for the relative improvements in girls’ inputs and outcomes is that there was more room for improvement for girls than boys, and as families’ incomes rose, parents provided more basic inputs to girls that helped them survive. Such catch-up was not a foregone conclusion, as families might instead use extra resources to let boys pull further ahead, for example, by giving them more expensive inputs like protein-rich food.

Policy also likely played a role in girls’ catch-up. Importantly, these policies need not have been gendered in their design. A striking finding in syntheses of education interventions is that gender-neutral policies that reduce the barriers to education tend to have larger impacts on girls because they are disadvantaged

1. The comparison countries for NFHS-3 are Armenia, Azerbaijan, Bangladesh, Benin, Cambodia, Cameroon, Chad, Colombia, Congo, Democratic Republic of Congo, Guinea, Haiti, Honduras, India, Indonesia, Jordan, Lebanon, Lesotho, Malawi, Mali, Morocco, Nepal, Nicaragua, Pakistan, Rwanda, Senegal, Tanzania, Uganda, Ukraine, Zambia, and Zimbabwe. The comparison countries for NFHS-5 are Albania, Angola, Armenia, Bangladesh, Benin, Cambodia, Cameroon, Colombia, Gambia, Guinea, Haiti, India, Indonesia, Jordan, Lebanon, Malawi, Mali, Mauritania, Moldova, Myanmar, Nepal, Nigeria, Pakistan, Papua New Guinea, Philippines, Rwanda, Senegal, Sierra Leone, South Africa, Tajikistan, Tanzania, Uganda, and Zambia.
to begin with (J-PAL 2017; Evans and Yuan 2022). The same pattern is likely to be true of health interventions. Gender-blind policies that have increased childbirth in health facilities and provided postnatal checkups through home visits might disproportionately help girls, narrowing gender gaps.

**Figure 2. Female-male Ratio of Infant Survival (NFHS-3 and NFHS-5)**
Unit: Y-axis, no unit; it is a ratio. X-axis, GDP per capita (PPP) expressed in 2022 USD

2.2. Nonetheless, Girls Remain Disadvantaged in Important Ways

Despite the positive trends along important dimensions, several recent studies document that girls continue to fare worse than boys in health inputs, such as dietary diversity and receipt of healthcare.

Dutta et al. (2022) document gender gaps in infant and young child feeding practices using NFHS-4 data. They find that girls under the age of six months are less likely to be exclusively breastfed than boys, and then, from age 6-23 months, they are less likely to be fed high-protein foods. Aurino (2017) uses the Young Lives data set that has dietary data through adolescence for a sample in Andhra Pradesh and Telangana. This study finds that boys enjoy a more diverse diet starting at young ages, and the pro-boy gap significantly widens between the age of 12 and 15 years, by which time girls consume fewer protein- and vitamin-rich foods such as eggs, legumes, root vegetables, and fruit.

Turning to healthcare uptake, Vilms et al. (2017) test for gender gaps in neonatal illness, care-seeking for neonatal illness, hospitalization, facility-based postnatal visits, immunizations, and postnatal home visits by health workers in a representative sample of households with infants in Bihar in 2014. Girls had a lower rate of neonatal illness and hospitalization than boys, consistent with the greater biological precariousness of males in infancy. However, in terms of care-seeking, girls were less likely to receive care if they were ill and less likely to receive a post-birth home check-up. However, there was no gender gap in vaccinations, consistent with what Figure 1 showed.

Dupas and Jain (2023) analyze claims data from Rajasthan’s Bhamashah Swasthya Bima Yojana Health Scheme (BSBY) health insurance program that offers enrollees free care in public and private hospitals. They find that females account for only 45 percent of all hospital visits, with especially large gaps among children under 10 years (33 percent of visits in this age range are for girls). This gap is particularly large for care in private hospitals and higher-value tertiary care.

These choices parents make collectively can lead to excess female mortality. In the absence of a universal civil registration system, the census of population offers a useful data source for measuring mortality, arguably better than NFHS because of the universal coverage. Guilmoto et al. (2018) use 2011 Census data to quantify excess female mortality before the age of 5 years. The study uses as a benchmark 46 countries with no known excess female mortality or sex selection and that have relatively similar mortality rates to India. The comparison countries allow one to calculate what female mortality one would expect if there were no son bias, given the observed rate of male mortality. The study finds that excess female mortality, averaged from 1996 to 2011, is 1.85 per 100 live births, with more than 90 percent of districts exhibiting excess female mortality. The five States and Union Territories with the highest rate of excess female under-5 mortality were the Hindi belt States: Uttar Pradesh,
Bihar, Delhi, Rajasthan, and Madhya Pradesh. It would be valuable to augment this analysis to examine trends over the study period and to update it when more recent Census data become available. NFHS-5 analysis is analogous to Figure 2 but for child mortality shows about 1 excess female death per 100 live births.

2.3. Unfortunately, Making Health Services Free Might not be Enough to Close the Remaining Gender Gaps

Gender gaps in health inputs exist even when the health services are free to families. This suggests that policies need to go beyond making healthcare free. Offsetting parents’ time and hassle costs might be necessary to close gender gaps in health care.

The Dupas and Jain (2023) study on Rajasthan found a gender gap despite free medical care for insurance enrollees. Travel costs or time costs are likely to be a major factor. Tandon et al. (2016) similarly find a gender gap in a context of free medical care. The male-to-female ratio of patients who received cardiac intervention, after being recommended for tertiary care through screenings at school, is 1.66, while the male-female prevalence ratio for congenital heart disease is only 1.1 to 1.25. The needed surgery was free for patients. Much of the gender gap seems to enter at the stage of who is being referred for care by the diagnosticians and cannot be explained by gender gaps in school enrollment. It is possible that girls opt out of the screenings or those doing the screenings are gender-biased in their screenings.

In an earlier study, Ramakrishnan et al. (2011) found that for children identified at the All India Institute of Medical Sciences in New Delhi as needing surgery to correct a congenital heart condition, a year later, 70 percent of the boys but only 44 percent of the girls had undergone surgery. Financial concerns are one issue, but qualitative interviews suggested that marriageability was also a factor: parents thought that the scar from surgery might hurt her marital prospects.

Other health inputs without a direct monetary cost also show gender gaps, such as breastfeeding (Jayachandran and Kuziemko 2011; Vilms et al. 2017). Another example is that, among families with one child at the time, households with an infant boy spend roughly 60 minutes more per day (about 30 percent more time) on childcare than households with an infant girl (Barcellos et al. 2014).

How can policy offset parents’ time and hassle costs to obtain health care for their daughters? In the case of medical care, policy options include reimbursement for travel costs. One could also offer incentives for follow-up care once a referral has been made; the after-a-referral provision addresses the concern that incentives could encourage overuse of medical care, but it is also possible to loosen this restriction. An alternative is to reward the outcome: payments for having healthy girls, for example, as measured by anthropometrics.
or anemia levels. This kind of policy has the advantage that it indirectly incentivizes pro-girl choices within the home such as time spent caring for children, breastfeeding, or food given to the child, which policymakers cannot directly observe, and therefore, cannot directly intervene on.

3. Eldest Son Preference and Fertility Patterns

While favoritism toward sons over daughters receives more attention, favoritism toward eldest sons relative to other sons is also an important phenomenon in India. Hinduism and patrilocal norms give eldest sons special roles in funeral rites and old-age support for parents. This centrality that eldest sons play in their parents’ life leads to greater investment in them.

A 2022 Pew opinion poll shows the strong gender norms for these familial roles, though without being specific about birth order. While 63 percent of the respondents said that sons should have the primary responsibility for parents’ funeral rites, only 1 percent said daughters should; the remaining 35 percent said responsibility should be shared (Pew Research Center 2022). Regarding the responsibility for caring for parents in old age, the majority thought it should be shared between sons and daughters, yet a large minority of respondents, 39 percent, said that sons bear this responsibility compared to only 2 percent who said that daughters do so.

**Figure 3. Not-stunted Non-eldest to Eldest Son Ratio (NFHS-5)**

Unit: Y-axis, no unit; it is a ratio. X-axis, GDP per capita (PPP) expressed in 2022 USD

3.1. In Addition to Gender Gaps, There are Also Stark Health Gaps between Eldest Sons, Who Tend to be Favored, and Other Sons

Jayachandran and Pande (2017) show that the anomalously high rate of stunting in India is related to eldest son preference. India’s stunting problem is almost as stark among non-eldest sons as among daughters, with eldest sons as the exception. These patterns are less pronounced among Muslims, who do not have strong eldest son preference as compared to Hindus, and in matrilineal parts of India, where son preference is weaker.

This pattern of eldest sons doing better than non-eldest sons continues to be true in more recent data. Figure 3 shows the non-eldest to eldest son ratio of not being stunted. Lower values map to more favoritism toward eldest sons, and India is a negative outlier.

3.2. The Desire to Have a Son—Specifically to Fill the Eldest Son Role in the Family—Is What Drives the Skewed Sex Ratio

The skewed sex ratio is concentrated at last births in the family, in cases where the previous children are daughters (Jayachandran 2015). A family that wants two children might have two daughters, try again, and use sex selection to ensure that their third child is a boy.

**Figure 4.** Sex Ratio of 3rd Child When Family Has 1 Boy and 1 Girl

Unit: Y-axis, no unit; it is a ratio. X-axis, GDP per capita (PPP) expressed in 2022 USD

This pattern is consistent with a premium on having at least one son, which differs from a general aversion to having daughters (for example, because of dowry expenses), which might lead to a high rate of sex selection even for first births. Jayachandran (2017) surveys parents in Haryana about fertility preferences and finds that they strongly want at least one son, but conditional on achieving that, prefer a balanced sex composition; they do not have a general preference to always have sons rather than daughters.

Indeed, when families with one boy and one girl give birth to a third child, there is no indication that they engage in sex selection to ensure that most of their children are boys. Figure 4 plots the female-male ratio of third-born children in families who already have a boy and a girl. For this category, India’s ratio is comparable to other countries’ and, in fact, is above 1.

Another way to see the link between eldest son preference and sex selection comes from studying patrilocality. Many cultures including India practice patrilocality, whereby a married couple joins the husband’s family and resides near or with his parents. This cultural system creates the strong perceived need for a couple to have a son so that he can support and care for them in old age. Ebenstein (2014) shows the strong association between the practice of patrilocality and the male-skewed sex ratio. Using Census micro-data and Demographic and Health Survey Data from several countries, he quantifies how often older men (age 60-plus) reside with an adult son, which provides a measure of de facto patrilocality. He finds that this measure is strongly correlated with the sex ratio at birth. As he writes, “Patrilocality is the single feature common to the social norms of Christians in Armenia, Muslims in Azerbaijan, Hindus in India, and Buddhists in China—all live with their sons when they are old” (pg. 3). These groups all exhibit a male-skewed sex ratio. The correlation also holds when comparing ethnic or religious groups within a country. For example, within India, Sikh and Jain elderly men are most likely to co-reside with a son, and these groups have especially male-skewed sex ratios at birth.

In addition to patrilocality, religious roles and the passing down of lineage and property also play a role, though it is worth noting that sex ratio is skewed even in patrilocal societies without the attendant religious premium put on sons.

3.3. Unlike Gender Gaps in Child Investment, the Desire to have a Son Shows Little Sign of Abating

Figure 5 shows that India continues to have an abnormally low female-male sex ratio at birth. The figure plots the sex ratio of births reported in NFHS, pooling the third to fifth waves and including births up to eight years before the survey. This enables a retrospective panel from the late 1990s to 2019. (I exclude 2020 and 2021 because the composition of States surveyed, year-by-year for NFHS-5, makes births in these years unrepresentative for all-India.)
The quest to have at least one son leads parents to engage in sex selection at the point when they no longer are willing to enlarge their family size to try for a son. This means, first, that the population sex ratio skews toward males and, second, the last child in the family is especially skewed toward sons.
Even when a family does not resort to sex selection, the sex ratio of the last child in the family becomes skewed through “stopping rules” (though the overall population sex ratio does not). If families keep trying to have a son, stopping once they have their sought-after son, then the son is their youngest child. Thus, the sex ratio at last birth is another metric of the desire to have a son, one that encompasses both sex selection and “trying again” as the means to obtain a son. Figure 6 shows the sex ratio of last births in India versus other countries. India’s ratio is 0.69 girls per boy, compared to 0.94 as the average among other countries.

Indian parents articulate their stronger preference to keep having children to obtain a son than a daughter. Figure 7 shows India’s exceptionalism, comparing NFHS-5 respondents to comparison-country DHS respondents. The figure focuses on those who have either two boys or two girls, using their response to a question about wanting to have another child. The variable along the vertical axis is the share of those with only boys who want another child (presumably to obtain a daughter) divided by the share of those with only girls who want to have another child (presumably to obtain a son). India’s male-biased mean of 0.36 is drastically below the comparison-group average of 0.95.

**Figure 7.** Wants Third Child if No Daughters Yet versus No Sons Yet

Unit: Y-axis, no unit; it is a ratio. X-axis, GDP per capita (PPP) expressed in 2022 USD

3.4. The Downward Trend in Family Size is Exacerbating How the Desire for a Son Translates into Sex Selection

Returning to sex-selection specifically, one reason why this practice has not abated is that the technology of sex selection has become more widely available and affordable. Another factor in sex selection is declining fertility.

The fertility squeeze is the term for the phenomenon that when family size is smaller, fewer families will have at least one son naturally (Das Gupta and Mari Bhat 1997). When parents want to have three or four children, the likelihood of naturally ending up with no sons is fairly low, but this scenario becomes more likely when couples want only two or even just one child. Therefore, as couples' desired family size gets smaller, they are more likely to resort to sex-selective abortions to obtain their desired son. Jayachandran (2014), using survey data from Haryana, documents this pattern that the desired sex ratio is more male-skewed at low fertility levels.

3.5. Families’ Quest for a Son Also Has Collateral Damage on His Sisters’ Health

The beginning of this paper discussed intentional (even if subconscious) under-investment in girls relative to boys. Girls can also receive fewer inputs than boys as a by-product of fertility choices around obtaining a son.

One reason this arises is due to total family size. A couple whose first two children are both sons, by chance, is more likely to stop having children than if the first two children are girls. The second family will keep trying to have a son. Girls, on average, grow up in larger families because of this type of fertility behavior (Yamaguchi 1989; Clark 2000). Given fixed financial resources, girls will grow up in families that have fewer resources to spend on each child. Thus, even if within the family, boys and girls receive equal inputs, because of cross-family differences, girls will receive fewer resources.

Another phenomenon, shown by Jayachandran and Kuziemko (2011), is that because women in India want to and are more likely to become pregnant again after a daughter is born, they stop breastfeeding girls sooner to regain their fecundity or because of the new pregnancy. This is detrimental to girls because of the health benefits of breastfeeding. In this case, the gap arises without parents having an explicit preference to provide more health inputs to sons. Dutta et al. (2022) similarly find a link with family composition consistent with plans for further fertility as the driver. Specifically, the lower rate of exclusive breastfeeding of girls and worse dietary diversity is especially large if the family already has two or more daughters and smaller if the family already has sons.

The desire to have an eldest son also increases girls’ stunting in India. Part of the collateral damage to girls’ health is that they are in larger families and competing with their favored brother for resources. A more subtle pattern is that later-born girls are harmed more by competition from brothers than their older sisters are (Jayachandran and Pande 2017). This arises partly because an
earlier-born girl is less likely to have a brother yet, so she is less likely to be competing with him, for example, over parental time, during the critical early stage of life. In addition, the birth of a second daughter after the first child was also female often triggers parents to adjust upward the number of children they plan to have so that they can obtain a son. This realization requires them to re-budget, and the spending cutbacks, even if spread equally across the two daughters, especially harm their second daughter because she is at the younger, more critical stage of child development. Thus, another harmful aspect of competition with the eldest son is that parents cannot anticipate their fertility perfectly (of course), and this makes outcomes for their daughters less equal.

4. Policy Implications

In this section, I discuss policy responses to the challenge of son preference, first, offering a cautionary assessment of two potential approaches and, second, discussing some tentative ideas for more promising approaches.

4.1. Empowering Women is not a Panacea that will Solve the Problem of Son Preference

The fact that the skewed sex ratio is exacerbated when family size is smaller upends some standard intuitions about what might solve the problem. For example, educating girls so that they grow up to be empowered mothers might perversely worsen the sex ratio. This is because while women’s education is associated with less son preference, it is also linked with lower desired and actual fertility (Pande and Astone 2007; Dreze and Murthi 2001). This link between female empowerment and smaller family sizes means that the sex ratio could become either more or less skewed with female empowerment.

To walk through this logic, Table 1 examines the association between maternal education and the preferences that feed into the sex ratio, following Jayachandran (2014). The key independent variable is a dummy variable for the mother having at least 8 years of education (which 40 percent of mothers in the Haryana survey sample have). The regressions control for the husband’s level of education and an extensive set of income and wealth proxies, but the results should be interpreted cautiously as unobservable factors correlated with mother’s education could be playing a role.

Column 1 of Table 1 examines the effect of female education on the sex ratio (defined as the percent of children who are sons) that the respondent desires at a family size specified by the surveyor. The data are from a survey conducted in Haryana. Because family size is exogenous to the respondent in this hypothetical scenario, the outcome variable is a “pure” measure of son preference, rather than a measure of how son preference manifests in the sex
The negative coefficient indicates that education reduces women’s son preference, as most people would conjecture. Column 2 examines the effect of education on desired family size. The outcome is based on the standard DHS-type fertility preference question which elicits the ideal family size. As has been documented often in the literature, more education is associated with a smaller desired family size.

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<td>% sons desired at specified family size</td>
<td>Desired % sons desired at desired family size</td>
</tr>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
</tr>
<tr>
<td>Mother finished class 8+</td>
<td>-0.039***</td>
<td>-0.087***</td>
</tr>
<tr>
<td></td>
<td>[0.011]</td>
<td>[0.017]</td>
</tr>
<tr>
<td>Actual family size</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>dummies</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Observations</td>
<td>2,883</td>
<td>2,597</td>
</tr>
</tbody>
</table>

These two results lay out offsetting effects: education reduces son preference at any given family size, which should decrease the desired sex ratio, but it also decreases desired family size, which increases the desired sex ratio if people want to still have at least one son. The net effect is shown in Column 3 of Table 1, where the outcome is the percentage of sons desired at the desired family size using the standard DHS-type question. The two effects almost exactly offset each other. The coefficient is small and statistically indistinguishable from zero. This null result is noteworthy: a progressive force like female education need not improve a woman’s desired sex ratio.

NFHS-3 data corroborate these patterns. Here, I analyze the actual sex ratio. Educated women have a less skewed sex ratios among their children, conditional on family size, suggesting that they have weaker son preference (or, alternatively, more power in their marriage to realize their preferences), as shown in Column 4 of Table 1. But the total effect of female education on the sex ratio, unconditional on family size, appears to be zero, as shown in Column 5 of Table 1. Female education does not make the sex ratio less skewed.

This analysis is consistent with the findings of Chhibber et al. (2021), who analyze the 2001 and 2011 Censuses and find that the sex ratio at birth is more
skewed among more educated mothers. They also find that the survival rate of girls is higher among educated mothers, but this second force is not enough to offset the first force, so educated mothers end up with fewer surviving girls. This phenomenon also means that girls are disproportionately in families with less educated mothers, a point I return to below.

To be clear, empowering women is worthwhile *per se* and seems to narrow some gender gaps affecting children, but it is far from clear that it will ameliorate the male-skewed sex ratio.

### 4.2. Offering Financial Incentives to Have Daughters Risks Further Concentrating Girls in Poorer Families

A widely used approach to address the skewed sex ratio is to offer financial incentives to have daughters. While one of the early schemes evaluated, Devi Rupak in Haryana, backfired by simultaneously trying to incentivize families to have more girls but fewer children overall, thereby worsening the sex ratio (Anukriti 2018), most policies now focus simply on the policy goal of encouraging daughters. These policies likely have increased the number of girls who are born. Biswas et al. (2023) evaluate the Government of India’s Dhanlakshmi scheme that was piloted in 11 blocks from 2008 to 2013. A family received Rs 5000 for showing proof of the birth’s registration (roughly equivalent to monthly household expenditures in the study sample), plus Rs 1250 for immunizing the girl, with further payments for schooling and remaining unmarried until 18 years. The study focuses on Sirhind block in Fatehgarh Sahib district in Punjab and finds an increase in the number of girls born. It is worth noting that some of the subsequent payments, such as to keep a girl in primary school, will be infra-marginal to families’ behavior, i.e., the family would have made this choice for their daughter anyway. Thus, the subsequent payments should also be thought of as partly just increasing the financial reward for giving birth to a daughter.

There are at least three limitations of policies that offer financial rewards for having daughters. First, they can be an expensive solution to the problem because most of the payments are infra-marginal. Suppose a program increases the share of newborns who are girls from 45 percent to 50 percent, as the Biswas et al. (2023) study roughly found. This means that for every 50 girls who were born, 45 would have been born absent the incentives, or only 10 percent of the payments were changing behavior. Moreover, 10 percent is an upper bound on how much of the program expenditure worked toward the goal of changing the sex ratio of births, as a smaller payment would have been sufficient to motivate some of those families that did change their behavior because of the reward. While the infra-marginal payments are not wasted money—the families who receive it are likely poor, and the family can use the money to invest more in their daughter—this approach is not the most targeted way to achieve either the
goal of providing anti-poverty transfers or to ensure that families invest more in their daughters.

Besides the high degree of infra-marginality, a second risk with this approach is that “extrinsically motivating” people to have daughters, by offering payment, could crowd out the intrinsic valuation of daughters.

The third and perhaps most worrisome limitation of such programs is that most of the increase in female births will be in poor families. Many of the State schemes limit participation to the poor, for example, to those with a Below the Poverty Line (BPL) card. But even without such a restriction, a payment of Rs 5000 is more likely to influence fertility choices for a poor family than a rich one. Thus, those who respond to the incentives will be poorer. As is, girls are disproportionately concentrated in poor families. One reason is that richer families have a smaller desired family size, and they can more readily afford ultrasound tests and abortions. Thus, they “need” and can engage in sex selection more. In addition, the scarcity of brides in the marriage market gives poorer families an incentive to have daughters who have an opportunity to “marry up” (Edlund 1999). Girls systematically growing up in poorer families creates societal-level gender gaps even absent within-family discrimination. Financial incentives to have daughters, which poor families are more responsive to, exacerbates this problem. While decreasing sex selection among the poor is valuable, it is important that improvement happens across the income distribution.

We are then left with the question of what policies can effectively solve this problem.

4.3. We Do Not Know Which Policies Will Erase the Disadvantages Girls Face in India, but There Are Several Policies That Warrant Pursuing or Testing

To address the skewed sex ratio, a key component of policy going forward must be to continue to robustly enforce the Pre-Conception and Pre-Natal Diagnostic Techniques Act, which bans sex selection. Enforcement is only becoming more challenging as ultrasound technology becomes cheaper and more mobile, but enforcement needs to continue to be a key part of the policy response.

Other policies that could address son bias include ramping up delivery of health services through schools, a public pension system, and policies that strengthen the intrinsic value that families place on girls.

4.3.1. Using Schools to Deliver Health Inputs and Health Care

As mentioned earlier, universal programs might disproportionately benefit girls. One example of gender gaps being narrowed through a universal program is iron supplementation through schools. Krämer et al. (2021) find that making the mid-day meals iron-fortified in Bihar schools (by providing iron-and-iodine double-fortified salt to schools to cook with) decreased anemia by 10
percentage points, or 22 percent, after one year of treatment. The point estimates suggest larger effects for girls (a 12-percentage point decline) than boys (an 8-percentage point decline), likely because girls’ baseline anemia rate is higher.

This example also highlights the importance of schools as a delivery vehicle for health interventions. India has made tremendous progress in closing education gender gaps, and this positions schools, as well as *anganwadis*, as a place to deliver health interventions. Using schools is valuable because it removes the “hassle cost” of a special trip to the health facility, which seems to be a surprisingly large barrier to girls’ health care.

Already this is happening. Child nutrition was a key motivation for setting up *anganwadis*, schools now provide mid-day meals, and health screenings at schools are common. Some recent studies have studied gender differences in the effects of these schemes. Ravindran (2021) found that the ICDS program, which encompasses *anganwadis*, had larger effects on the height, weight, and education of girls than those of boys. Ganimian et al. (Forthcoming) find larger benefits on cognitive outcomes for girls than boys of adding a worker to *anganwadis*, but, in this case, the health effects are similar across genders.

Another existing program in this vein is the weekly iron and folic supplementation (WIFS) program. While causal evidence on the effects of WIFS is scarce, various studies document implementation problems (Kapil et al. 2019). Fixing implementation problems in school-based health programs (or similarly in ASHA home visit programs that reduce time costs for parents to get health check-ups for children) will likely differentially help girls. Thus, strengthening implementation of existing gender-blind programs is likely to be helpful in closing gender gaps in health outcomes.

### 4.3.2. Government-provided Old-age Support

One type of policy that could attenuate the skewed sex ratio is a formal system for income support in old age. A government pension scheme offers older adults a substitute for support from sons, lessening the need to have a son. While the problem of the skewed sex ratio should not be the impetus for instituting a pension scheme, a decision that entails many other considerations, the key point is that such a program could have a secondary benefit related to sex-selection.

Evidence supporting this idea exists for China. Ebenstein and Leung (2010) analyze the introduction of the Rural Old-Age Pension Program, and show, first, that households without sons are more likely to participate in the pension program and, second, having access to the pension program is associated with a less male-skewed sex ratio. Guo et al. (2023) report similar results in their analysis of the more recent New Rural Pension Scheme in China, finding that the sex ratio became less skewed among those with access to the pension scheme.

The success story of a country that overcame its problem of male-skewed births is South Korea. While the keys to South Korea’s turnaround are multi-
faceted, one factor may have been pensions. In 1995, the government pension scheme in South Korea was expanded to cover self-employed workers in rural areas. Ebenstein (2014) tests the prediction that this group should experience a decline in sex selection. In a difference-in-difference design, the sex ratio indeed becomes less skewed for self-employed workers relative to salaried workers, who were already covered by the pension and experienced no change in 1995.

While none of the existing evidence is airtight, the combination of evidence from other contexts and theory suggests that alternatives to eldest-son support for Indian parents might lessen the centrality of having a son.

4.4. Changing Hearts and Minds

The desire for sons goes beyond pragmatic reasons like old-age support and takes on a life of its own as a conferrer of status. Ultimately, the status associated with having sons must dissipate to fully close gender gaps. The Government of India’s ‘Beti Bachao Beti Padhao’ (“Save girls, educate girls”) scheme that began in 2015 includes awareness campaigns, celebration of daughters, and other policies to raise the status of girls. While we do not have reliable evidence on the impacts, such efforts to “change hearts and minds” seem essential to fully solve this problem.

Here, too, schools could be a powerful venue, as seen in Dhar et al.’s (2022) evaluation of a gender equality curriculum added to Haryana secondary schools. The program, designed and run by the non-profit breakthrough, succeeded in instilling more support for equality among students, including around fertility preferences.

Beyond schools, media campaigns and messaging embedded in films seem important avenues for more innovation and effort. Testimonials from politicians and celebrities about their satisfaction with their daughter-only families seem promising too. As two-child families become typical in India, a quarter of families will be daughter-only naturally, and making this a satisfying outcome is the only way to fully address India’s sex imbalance.

References


To view the entire video of this IPF session and the General Discussion that ended the session, please scan this QR code or use the following URL

https://youtu.be/z7cNspVCIyY
Male preferences are manifested in two key ways: (i) through decisions related to fertility, specifically in choosing the gender of the child at conception or birth, even with available technologies that may be legally restricted; and (ii) through human capital investments post-birth, impacting health outcomes. The focus of the paper presented by Seema Jayachandran is on gender differences in sex ratios at birth and how these choices translate into health outcomes. However, the conversation also broadens to encompass human capital investments more generally, spanning education and health, with implications for labor market returns and adulthood outcomes. This analysis underscores the multi-faceted nature of male preferences and their influence on the decisions that households make throughout various stages of life.

Fertility Choice

The paper primarily focuses on the first aspect, namely fertility choice, and explores how these choices are influenced by social, religious, and cultural factors. The analysis highlights the persistent nature of cultural and social norms, emphasizing their resistance to change and their impact on the lower social value assigned to female children. The discussion notes that these preferences for sons are not only enduring but may potentially intensify with decreasing family sizes, as observed in India’s declining fertility rates. An intriguing question posed is whether empowering or educating women could lead to an improvement in the sex ratio, as women with increased decision-making power might opt for a more balanced gender distribution at birth. This consideration underscores the importance of understanding the interplay between cultural
norms, education, and gender dynamics in shaping fertility decisions. A table presented in the paper discusses the evolving educational attainment of women, noting a declining gender gap in education in India. I observe that policy discussions often place responsibility on women or mothers for changes in societal dynamics, especially regarding empowerment and education. However, I emphasize that fertility decisions are joint choices, involving both partners. In the cultural context discussed, husbands can influence these decisions with their preferences. This raises a crucial point about the need to understand how men’s education is affecting their preferences in terms of achieving a more balanced gender ratio. Additionally, I underscore the importance of considering and documenting data on men’s preferences, as these are integral to the joint decision-making process in family planning.

**Investment Preferences**

The second aspect discussed in the paper revolves around investment preferences after the birth of children. While cultural and religious factors shape the desire for at least one son, I shift the focus to decisions regarding resource allocation, particularly in health. This involves determining how to distribute resources for the health and education of children, with a current emphasis on health outcomes such as BMI and anemia. These investment preferences are more flexible and potentially responsive to changes in market returns. This opens up a discussion on policy interventions aimed at influencing households’ preferences regarding the gender ratio of their children. There is need to consider policy strategies to alter these investment preferences and, by extension, the impact on health and education outcomes. The first point emphasizes that gender gaps in child health inputs, such as vaccinations, and survival rates have reduced, indicating positive changes in investment preferences. Additionally, gender-neutral school-based transfer programs, particularly from the Integrated Child Development Services (ICDS) and school meal programs, have shown improvements in girls’ outcomes, both in nutrition and education. The paper, according to me, effectively documents that financial incentives to favor girl children have been inefficient or even counterproductive in some states. Instead, the paper recommends reinforcing the ban on sex-selective abortions, implementing public pensions, and utilizing nutrition and health delivery programs administered through schools. This proposed set of policies aims to address and potentially reshape households’ preferences toward a more balanced gender ratio in their children.
Policy Interventions

The potential policy interventions that can be explored are the ones with a broader focus on intra-household resource allocation, aiming to increase incentives for households to invest more in the human capital of daughters. The central question is how to encourage families to allocate resources equitably among their children. I suggest considering the labor market dynamics, but the specific details are not provided in the current context. However, the broader idea seems to involve developing policies that address and reshape traditional intra-household resource allocation patterns, ultimately promoting greater investment in the education and well-being of daughters. Thinking beyond specific programs and incentives, I urge a comprehensive approach to incentivize positive changes in household preferences and behaviors. The significant gender gaps in labor market returns highlight that women typically demand or receive lower returns. This disparity, coupled with perceptions of low market demand for women’s labor, creates challenges in justifying investments in daughters’ education and health. The additional factors influencing these decisions include issues related to exogamy, patrilocality in marriage, and dowry practices. The concern is that investing in a girl child may not yield sufficient returns for the family, as she may either contribute little due to low market returns or become part of another family. Consequently, households perceive the net returns to investments in daughters as low or even negative, potentially influencing fertility decisions. This perspective underscores the need for addressing broader societal and cultural factors that impact the perceived value of investing in the human capital of daughters.

Gender Gaps

Figure 1, illustrating the ratio of female to male daily wages, based on data from the Periodic Labour Force Survey (PLFS, 2018-19) highlights the gender gap in the returns in terms of daily wages (Afridi et al. 2023). This gap tends to decrease with higher levels of education. Notably, the average education level for women is around higher secondary, with many completing school education.

The right panel in Figure 1 depicts the average daily wage by the proportion of female employees in various occupations. The trend shows that as the proportion of female workers in an occupation increases, the average wage in those occupations tends to decrease. This suggests that certain occupational choices made by women, influenced by cultural and social factors, may contribute to the observed wage disparities. Women might be inclined toward occupations that allow them to balance domestic and market work. From a parental perspective, considering potential returns on investments in a girl child, there’s a perception that these returns are likely to be lower as compared to investments in a boy
This insight underscores the impact of occupational choices on gender-based wage differentials and its implications for family decisions.

Source: Afridi, Arora, Dhar and Mahajan (2023a).
Note: The left panel in the figure plots average daily wage rates for employed individuals in paid employment (salaried or casual) by gender and education. The right panel in the figure shows the correlation between the proportion of women workers of the total employees in an occupation (X-axis) and the log of the average daily wage in each occupation (Y-axis) in urban India. Data is from PLFS (2018-19).
Case Study: Low Adoption of Technology That Can Improve Women’s Health and Productivity

A study was conducted by Afridi et al. (2023), building on the Ujjwala program, a government initiative in India, which encouraged households to shift from solid fuels to LPG for cooking, through an information campaign. Time use survey data from the study (Figure 2) indicate that women predominantly spend their time on cooking and cleaning, making any technological change that enhances women’s productivity within the home potentially valuable. However, the study reveals that, despite the availability of this technology, households show a low incentive to adopt it due to the perceived low returns from the market. On average, the adoption of this technology accounts for only about 20 to 30 percent of the monthly household income, while the time savings, if translated into average wages, represent merely about 5 percent of monthly household income. This lack of alignment between the perceived economic benefits and the costs of adopting the technology results in a minimal incentive for households to make the switch, which can improve women’s health—the primary cooks in most Indian households.

FIGURE 2. Distribution of Rural Women’s Time in Domestic Work

Source: Afridi, Debnath, Dinkelman and Sareen (2023b).
Thus, when considering investments in women and girls, as compared to men and boys, the challenge lies in the combination of low market wages and the perception or reality of insufficient demand for women’s labor. Data suggest that along the education spectrum of women, from illiterate to graduate and above, the returns to home productivity increase significantly, but the returns to the market work do not keep pace. This raises questions about the incentives for educating women and investing in the health and education of girls.

Two influential papers underscore the need to enhance investments in the girl child, with implications for their health outcomes. The first, by Jensen (2012), involved a Randomized Control Trial (RCT) that increased awareness and access to employment opportunities in the BPO sector in States with skewed sex ratios, such as Haryana, Punjab, and Delhi. Notably, the paper found that just providing information about the higher returns girls could receive led to a substantial increase in the Body Mass Index (BMI) of 5-to-15-year-old girls in these households. This outcome suggests intergenerational effects resulting from improved awareness and corrected perceptions of the potential returns on investment in girls’ education and employment.

The second prominent paper from China (Qian 2008), highlights an increase in the market value of returns to cultivating tea, a sector where women are more engaged. This shift resulted from higher support prices post-Mao and led to less male-skewed sex ratios in China. Both the China study and the one by Jensen in India underscore that boosting the returns on investments in women can have broad implications, influencing not only the human capital investments in currently alive girls but also impacting fertility choices.

I now shift the discussion to additional policy interventions on the demand side, aiming to enhance women’s engagement in the labor market. The cultural and social factors, such as patrilocality and exogamy, which may limit the perceived returns for families investing in the education and employment of girls. Despite the legal minimum age of marriage being 18 years, a significant portion of women aged 18 to 29 years still marry before reaching this minimum age. The policy interventions to delay girls’ marriages are potentially tied to perceived returns in the labor market. Additionally, the importance of addressing physical mobility, ensuring access to workplaces, work opportunities, and ensuring safety become crucial in promoting greater female participation in the labor market while addressing associated social costs.

In conclusion, we must acknowledge the progress made but emphasize that more efforts are needed, as highlighted in the paper by Dr Jayachandran. Positive effects have been observed with certain measures addressing the skewed sex ratio and associated health outcomes. The key takeaway is the urgent need to increase the perceived returns on investments in women. The fundamental issue identified is the low value placed on women’s time and labor. Changing this persistent challenge requires a fundamental shift in the perceived and actual returns to investments in women.
Introduction

The paper by Professor Jayachandran reviews the modern significance of the phenomenon of “son preference”, a key dimension of gender-linked inequalities in India. Following a brief review of the gains on this front in recent years, mainly arising from reduced gender differentials in infant mortality, the paper presents evidence on the persistence of adverse outcomes for girl children in India, relative to their boy counterparts. The author then discusses the pros and cons of alternative policy options to address son preference and presents a future research agenda focused on investigating policy steps that appear promising.

Professor Jayachandran is especially concerned about how the desire to have a son drives a sex ratio that favors males at younger ages and lowers human capital investments among girl children. The paper notes that owing to the differential ability of households across economic strata to afford technological means (such as ultrasounds) to identify the sex of the child, the skewed sex ratio in India is accompanied by a concentration of girls in poorer households. This feature, in turn, results in lower health outcomes for households and educational investments in girl children, all else remaining the same. The trend towards lower fertility rates in India is, if anything, exacerbating sex selection because the desire for at least one male child results in the share of male children increasing in an environment of overall fewer children.

Professor Jayachandran has discussed various policy alternatives in the paper. It is suggested that strategies that empower women may not be very effective in addressing the inequalities resulting from son preference because though they would lower son preference and fertility rates, the desire to have at least one
male child could skew the sex ratio against girls. Moreover, health subsidies for curative care targeted towards women are discounted on grounds of moral hazard, alongside delivery of public health interventions through schools, taking advantage of increased school enrolments among girl children. Since at least some of the desire for son preference in Indian households stems from social expectations of the son as a provider of old age support to parents, it is suggested that publicly-funded pensions could help to limit the skewed sex ratios in India and lower investments in girl children. Finally, the author suggests focusing on interventions that address social attitudes and son preference norms.

**Thoughts on the Paper plus Some Speculation**

This paper covers a lot of ground and is engaging reading. That the phenomenon of son preference persists even 75 years after Independence, plus India’s lagging behind its neighbors such as Bangladesh and Sri Lanka in indicators of gender equality, ought to be a matter of deep policy anguish. The implications of son preference can be expected to go well beyond that of gender equity, including adversely influencing national economic growth, a subject that is close to the heart of Indian policymakers. But I also suspect that trends in population and disease dynamics currently underway are likely to ensure that the situation will not remain static, and that future changes in the status of women and the girl child are likely to occur in ways that could not have been visualized previously. In the remainder of my comments, I will expand on these ideas and additionally indulge in some speculation. Underpinning these comments is the idea that it will be important to keep track of ongoing developments in this somewhat dynamic space.

First, a few comments on the recommendations in the paper, especially those related to increased provision of old age pensions and research on interventions to influence son preference norms. I understand the rationale for these policy proposals, but I am not totally convinced that these are going to work. For pensions, I suspect that we are talking about government money on a scale that is unlikely to be forthcoming in the near term. To be considered credible, it will be good to see some estimates of just how much money is required to compensate parents forgoing the role of the older son as a source of social security. Nor will it be straightforward to bring *about norm change* from external interventions. Instead, I would argue that efforts by internal change agents, often influential members of the community, are much more likely to change parental preferences for sons but these are unlikely to be readily identifiable by experimental research projects. Unlike the author, I am not as concerned about moral hazard issues resulting from efforts to enhance gender equity via improving girls’ and women’s access to healthcare through policies that increase reimbursement for the costs of medical care. The average levels of
health services accessed are so low on average, say as compared to high-income countries, or even high-functioning States such as Kerala and Tamil Nadu, that any increase in health service use is likely desirable.

Second, policy design must consider the population and disease dynamics underway and the social changes that are likely to occur as a result. A key theme in the son-preference literature is the role of the elder son as a source of support in old age. But this role will confront an awkward fact at some point: that large numbers of elderly Indians are living much longer than before and with high levels of sickness and disability, due to the rising prevalence of non-communicable conditions. One potential consequence is that taking care of the elderly will become increasingly more strenuous in smaller households and expensive, relative to any perceived economic advantages. I suspect a role reversal could well take place—that is, it is not the economically strongest (the elder son) but the economically weakest (usually a daughter or the younger son) who ends up taking care of the elderly, ideally one who is unable to migrate or is married into a family close to where the elderly live. I suppose then that the implications for sex selection and parental investments in children of different genders going forward can be quite dramatic.

Third, I wish to suggest a way forward to help bring issues of son preference to policymakers’ attention, by a focus on the economic bottom line, and not just the associated equity dimension. These days, it is common to speak of India as enjoying a huge potential demographic dividend just waiting for the right set of policy initiatives to be properly enjoyed. How does an environment of “elder son-preference” impact this economic potential? Two arguments that have typically been used in this context are that as fertility declines as part of the demographic transition, parents can invest more in their children, which also offers an opening for women to increase their participation in the workforce. But if resource allocation distortions such as those outlined in the paper dominate, son preference would have the effect of ensuring continued high levels of investment among men who already have high work participation rates, and the neglect of women, who have the largest economic potential, given their low work participation rates. We can expect the share of marriages across the economic divide to increase (poorer women with richer men) due to a general shortage of women in richer groups, which could also drive down women’s work participation, on average, as women in lower income groups tend to have higher rates of work participation than average. Skewed sex ratios may also lead to increased age gaps among couples (older men and younger women), which may also adversely impact educational investments among women.

Related to the thesis of the preceding paragraph, I suspect the Chinese experience with the one-child policy might be pertinent for understanding another dimension of India’s growth prospects in an environment of son preference. Cameron et al. (2013) have suggested that the one-child policy was associated with parents “over-investing” in their children, producing children
who tended to exhibit traits characterized by greater risk-averse behavior, less trust in others, less reliability, and less competitiveness, that is, not well-suited to the labor market. Do the Chinese of the one-child cohort share these traits with the beneficiaries of the ‘son preference’ syndrome (the male progeny, especially the oldest male child) in India? Is that a factor in the high levels of excess demand for government jobs in India? That may be a topic for further work.

Reference


General Discussion

Maitreesh Ghatak began the discussion by mentioning the inheritance laws in India. He said that there are variations in inheritance laws across Indian States, particularly in relation to gender. Some southern States have altered these laws, which have been studied in research papers to examine their impact on factors like human capital investment. The paper raises questions about policy approaches to address this issue and their feasibility. He also highlighted the significant heterogeneity in gender outcomes presented in the paper, with regard to different Indian States, such as Haryana, Kerala, and Tamil Nadu. He emphasized the need to consider these differences, along with variations in culture, history, and economic conditions, as well as the compositional factors that influence outcomes across the income and wealth spectrums. He suggested that exploring more specific data beyond averages would offer better insights.

Ratna Sahay made a series of observations and shared a personal experience. She explained her involvement in promoting gender inclusion in macro policy-making, mentioning that the IMF's approach had changed due to female leaders' influence. She described how she initiated this work, initially seeking volunteers. However, when 25 women volunteered, she realized the need for men's participation too in the decision-making process. She noted that men, though not inherently biased, need greater awareness and involvement to make impactful decisions. She mentioned that her strategy was endorsed by 190 countries, wherein the involvement of senior men led to more comprehensive decisions. She cited Saudi Arabia's example, where leadership decisions have led to a significant increase in the female labor force participation in a short time. In contrast, India's low ranking in terms of social, cultural, and religious norms, and its impact on women's economic empowerment, even compared to several sub-Saharan and Middle Eastern countries, is a surprise. She also suggested that the author could explore additional variables such as urban
versus rural settings and higher versus lower income groups, which could also impact the outcomes.

Barbara McPake shared her insights on the tension between declining fertility rates and gender implications. She discussed the importance of policy implications, emphasizing the role of easy and accessible healthcare services in reducing gender inequities in vaccination rates. She mentioned research on children with acute respiratory infections in Uttar Pradesh and Odisha, where boys were not more likely to be treated, but they received more spending and care. She highlighted the need to focus on improving the quality of primary care and making it easily accessible for everyone to address these disparities.

Sonalde Desai appreciated the author’s distinction between investments in children and sex preference, noting that evidence suggests these factors can move in opposite directions, with some parents choosing not to have daughters if they strongly prefer sons. Second, she expressed skepticism about the link between women’s employment and investments in children or sex preference, citing research that did not find a clear connection. She also noted that while women’s employment has been falling in India, there has been a slight decline in sex preference, suggesting a complex relationship that might require further examination in future research.

Devesh Kapur flagged the paradoxical combination of low female labor force participation alongside increased investment in female education, and achievement of gender equality in education in India, reflected in the fact that more women are now graduating from college than men, a significant global trend. This paradox raises questions about how to comprehend this shift in the context of traditional barriers to investing in girls, such as patrilocality and dowry.

Manish Sabharwal asked if improvement in general prosperity and the increase in per capita income have been the primary drivers of change in female education or if it is the result of smaller, localized interventions and bans, which he referred to as ‘fireflies and froth’. He also expressed uncertainty about the actual impact of State capacity, suggesting that what is documented on paper may not necessarily translate into real-world results. The key question was what played a more crucial role—the rise in prosperity and per capita income or localized interventions and bans.

Analyzing the question raised by Devesh Kapur about the disparity between increased education parity and women’s labor force participation, Farzana Afridi emphasized the importance of taking the marriage market into account when contemplating investments in children, especially girls. She argued that the marriage market plays a significant role in influencing parents’ investments in their daughters, encompassing both health and education. This is because as long as marriage remains a universal and primary goal for most women and girls, it becomes the parents’ foremost objective. She also pointed out the need to establish a clear connection between the investments made and the returns observed in the labor market versus those in the marriage market, as
currently, this decomposition has not been explored thoroughly. She further raised another critical question: Are women receiving education that leads to significant labor market returns? For instance, many women may be choosing careers like teaching due to societal expectations, which might not have the same labor market rewards as other professions like law or engineering. In this context, she cited Claudia Goldin’s work, which highlights how structural transformations and technology changes in the U.S. have allowed women to make longer-term investments in professions like law and medicine.

Karthik Muralidharan suggested that it is crucial to examine data on time use related to elderly care. He pointed out that the traditional patriarchal norm often does involve daughters taking care of their parents in certain cultures. However, if daughters have more autonomy and income, it could enable them to contribute more to elderly care. This, in turn, might circumvent some of the challenges associated with norms and female labor force participation. He inquired about any recent data sources or attempts to examine elderly care and time use, and how norms might intersect with female labor force participation in this context. He also wondered if these norms vary significantly from village to village, district to district, or State to State, as the localization of norms is relevant for policy implications. He cited the historical example of changes in norms in the U.S. during and after World War II when women entered the workforce, a phenomenon that had far-reaching social effects.

Surjit Bhalla commented on gender parity in education, particularly in the STEM (Science, Technology, Engineering, and Mathematics) fields. He noted the significant advances in this area, highlighting that India has the fifth-highest representation of women in STEM graduation in the world. He challenged the common conclusion that there are very few women in STEM in India and argued that the situation may not be as dire as it is sometimes portrayed.

Poonam Gupta raised an important point regarding policymaking and gender parity in India. She argued that policymakers at the highest levels believe that the next phase of India's economic growth will be driven by women but are uncertain about how to facilitate this transformation. She emphasized that the discussion has revolved around not just achieving parity in areas like access to healthcare and education but also about how to harness the potential of the female workforce effectively. She pondered over the role of messaging in changing norms and promoting gender equality without necessitating extensive fiscal or logistical efforts. The Government has already invested in messaging campaigns like "save the girl child, educate the girl child", and the potential impact of public awareness campaigns and messaging in shaping attitudes and norms towards gender equality and women's participation in the workforce needs to be examined. She also raised concerns about promoting more flexibility for women to work from home. Farzana's presentation revealed that women already spend a significant amount of time on household chores, and their productivity has increased. Women are often expected to continue performing these household
tasks, and adding the expectation of working from home on top of that may not be the ideal direction to pursue. This leads to questions about the balance between work and domestic responsibilities, and whether such an approach truly aligns with the goals of promoting gender equality and women's well-being.

Dilip Mookherjee inquired about the impact of reservations of positions for women in panchayats (local self-government bodies) on gender roles in villages. He asked if any studies had examined the effects of such reservations on the dynamics of gender roles within rural communities. This question pertains to the broader discussion about gender equality and women's participation in decision-making at the grassroots level in India.

Ajay Mahal questioned whether education in the STEM fields would significantly impact women's labor force participation in India, given the prevalence of female dentists, doctors, and engineers, who are married and not working. He then addressed Poonam Gupta’s point about elderly care, mentioning research conducted in Australia showing that when the elderly take care of children, it can facilitate women's participation in the workforce. He opined that in India, the primary issue may be the limited availability of elderly caregivers other than the husband's parents.

Farzana Afridi raised important points about the challenges of capturing caregiving responsibilities and time use in data, particularly in the context of changing family structures. She mentioned that as families move towards nuclear arrangements, daughters may make occasional trips to help elderly parents, which may not be reflected in traditional time use surveys that focus on an average or normal day. She acknowledged the difficulty in accurately capturing such occasional caregiving activities in survey data. She also touched upon her work on platform and gig work, and the impact of such work on women's social networks and engagement with society. It is important to understand women's labor force participation from a rational perspective. For instance, women may choose to stay at home because the available opportunities and returns in the labor market do not justify their participation in work outside. Hence, rather than pushing women to work, policymakers should focus on creating better opportunities and improving conditions in the labor market, allowing women to make choices that align with their preferences and optimize their contributions.

Deeksha from the Ministry of Finance raised an interesting question about whether social messaging encourages women to take responsibility for caring for their parents, especially in their old age. She suggested that nudging women to consider this responsibility could potentially help shift societal norms and expectations.

The session video and all slide presentation for this IPF session are hyperlinked on the IPF Program available by scanning this QR code or going to:
https://www.ncaer.org/IPF2023/Agenda.pdf
The Past and Future of Indian Finance

ABSTRACT India’s growth story depends on the vitality of its financial system. Within the span of five years, the Indian economy has endured two unprecedented shocks: the 2019 economic slowdown triggered by a financial crisis, and the COVID-19 pandemic. As we navigate the aftermath of these episodes, one vital question emerges: how resilient will India’s financial system be in the face of future challenges? This paper embarks on three missions. First, it dissects the origins and aftermath of the Indian Financial Crisis of 2018–20, sparked by a run on the shadow banks. Second, it examines how India fortified its financial system in the wake of this financial crisis and the pandemic, consequently shielding itself from the global banking disruptions of 2023. Finally, it gazes ahead at potential challenges and opportunities, sketching a blueprint for key reforms. Overall, the future trajectory of India’s economic growth, whether a modest 5.5 percent or a bold 7.5 percent, rests significantly on the progress of ongoing financial sector reforms.

Keywords: Economic Growth; India; Indian Finance; Financial Crisis; Financial Reforms; Macrofinance; Shadow Banking

JEL Classification: E50, G21, G23, G28, O16, O53

1. Introduction

Over the past three decades, India’s growth has been extraordinary, lifting millions out of poverty. But this journey has not been without its challenges, particularly in the financial sector, which has encountered speedbumps along the way. As India continues to forge its economic path, the influence of the financial system will remain vital. The trajectory of this system will directly impact the futures of over a billion people in India and carry substantial implications for the global economy.

This paper has benefited from interactions with Vinod Agarwal, Faisal Ahmed, Surjit Bhalla, Luis Breuer, Giovanni Dell’Ariccia, Ehsan Ebrahimy, Pranav Garg, Stefano Giglio, Gita Gopinath, Xavier Jaravel, Shishir Kedia, Adnan Mazarei, Sudip Mohapatra, Marina Moretti, Sumiko Ogawa, Mahmood Pradhan, Saurabh Roy, Ranil Salgado, Alfred Schipke, Jeremy Stein, Oliver Wuensch and seminar participants at the Yale School of Management and University of Massachusetts Amherst. This paper does not reflect the views of any institutions that I am affiliated with.
Guided by this understanding, this paper dives into the realm of Indian finance. We will focus on the Indian Financial Crisis of 2018-20 and the COVID pandemic of 2020-23.

On the eve of the pandemic, India was already grappling with a major economic slowdown. By March 2020, marking the end of the 2019-20 fiscal year’s last quarter, GDP growth had steeply fallen to just 2.9 percent, a stark contrast from the 7 percent decade average. For the first time in over a decade, aggregate investment—accounting for a quarter of GDP—experienced continuous contraction, declining by more than 4 percent over three successive quarters. This paper asserts that the Indian Financial Crisis of 2018-20 was the primary driver of this slowdown, highlighting the financial system’s critical role in India’s growth story.

In parts I–III, we dissect the crisis through three lenses: (a) the accumulation of risks from 2000 to 2018; (b) the financial tremors triggered by two shadow bank defaults in 2018 and 2019; and (c) the widespread economic damage inflicted between 2018 and 2020.

In Part IV, we shift our attention to the crisis response, detailing the policy responses enacted to combat these financial challenges. We will also explore how government strategies bolstered the economy against the backdrop of the COVID-19 pandemic. These efforts eventually fortified the financial system but also served as a safeguard against the adversities faced by Western banks in the first half of 2023.

Lastly, in Part V, I highlight three central challenges facing India: (1) Addressing the funding imbalance between traditional and shadow banks (‘The Great Funding Imbalance’); (2) Expanding credit accessibility across the country (‘The Financial Deepening Hurdle’); and (3) Striking the right balance between economic growth, financial stability, and nurturing national champions (‘The Growth Strategy Trilemma’). I also discuss the potential opportunities arising from India’s digital payments revolution.

The key takeaway: The future trajectory of Indian growth, whether a modest 5.5 percent or a bold 7.5 percent, rests significantly on the progress of ongoing financial sector reforms.

1.1. A Quarter Century of Credit in India: Six Stylized Facts

India’s financial ecosystem is an ensemble of diverse actors, each vital within their sphere. Formal credit in India is granted by three types of financial entities (Figure 1):

- **Scheduled Commercial Banks**: Encompassing public sector banks, private banks, and foreign banks.
- **Non-Scheduled Banks**: Cooperative banks, small finance banks, and payment banks.
- **Non-Bank Financial Institutions**: Nonbank financial companies (NBFCs) and development finance institutions (also known as All India Financial Institutions).

In addition, a substantial informal lending network exists, particularly vital for small and medium-sized enterprises. Six critical observations about these credit providers in India can guide our analysis:

**FIGURE 1. Lending Institutions in India and the Size of their Assets**

<table>
<thead>
<tr>
<th>Lending Institutions in India</th>
<th>Percentage of GDP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scheduled Commercial Banks</td>
<td>54%</td>
</tr>
<tr>
<td>Non-Scheduled Commercial Banks</td>
<td>31%</td>
</tr>
<tr>
<td>Non-Bank Financial Institutions</td>
<td>16%</td>
</tr>
<tr>
<td>Public Sector Banks</td>
<td>54%</td>
</tr>
<tr>
<td>Cooperative Banks</td>
<td>4%</td>
</tr>
<tr>
<td>Non-Bank Financial Companies (NBFCs)</td>
<td>16%</td>
</tr>
<tr>
<td>Private Banks</td>
<td>31%</td>
</tr>
<tr>
<td>Small Finance Banks &amp; Payment Banks</td>
<td>1%</td>
</tr>
<tr>
<td>Development Finance Institutions</td>
<td>5%</td>
</tr>
<tr>
<td>Foreign Banks</td>
<td>6%</td>
</tr>
</tbody>
</table>

Source: Author’s calculation.

Note: The numbers represent the assets as share of GDP in 2022.
## Table 1. Assets of Banks & Nonbanks in India

<table>
<thead>
<tr>
<th>Category</th>
<th>Institution Type</th>
<th>Assets (in % of GDP)</th>
<th>Relative Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>2022</td>
<td>1997</td>
</tr>
<tr>
<td>Scheduled Commercial Banks</td>
<td>Public Sector Banks</td>
<td>54.1</td>
<td>40.4</td>
</tr>
<tr>
<td></td>
<td>Private Sector Banks</td>
<td>31.4</td>
<td>3.2</td>
</tr>
<tr>
<td></td>
<td>Foreign Banks</td>
<td>5.8</td>
<td>1.2</td>
</tr>
<tr>
<td>Non-Scheduled Banks</td>
<td>Cooperative Banks</td>
<td>4.4</td>
<td>1.7</td>
</tr>
<tr>
<td></td>
<td>Small Finance Banks &amp; Other Non-Scheduled Banks</td>
<td>0.9</td>
<td>0.2</td>
</tr>
<tr>
<td>Non Bank Financial Institutions</td>
<td>Non Bank Financial Companies</td>
<td>16.3</td>
<td>2.6</td>
</tr>
<tr>
<td></td>
<td>Development Finance Institutions (AIFIs)</td>
<td>5.2</td>
<td>9.5</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>118.2</td>
<td>58.8</td>
</tr>
</tbody>
</table>

Source: RBI, MOSPI, and author’s calculations.

1. **Bank and nonbank assets as a percentage of GDP have doubled in the past 25 years:** In 2022, the combined assets of banks and nonbanks were 118 percent of GDP, a leap from 59 percent in 1997 (Table 1). Moreover, in 2022, credit from banks and nonbanks constituted approximately 70 percent of GDP, with banks contributing 52 percent, and nonbank financial institutions providing the remainder.

2. **Public sector’s share of the financial ecosystem has decreased from 80 percent to 50 percent:** Public sector banks have historically been significant contributors to bank lending. In the late 1990s, these banks, together with government-directed development banks, made up nearly 80 percent of system assets. By 2022, their share was approximately 50 percent, with private banks and NBFCs filling the gap.

3. **Shadow banking (NBFCs) has grown six-fold and now represents one-sixth of the system:** In the last decade, shadow banking has gained momentum in the credit industry, which was traditionally dominated by commercial banks. By 2022, shadow banks made up over 16 percent of the financial system measured by assets. Most of these—more than 99 percent—are standard Non-Banking Financial Companies (NBFCs) and a type of NBFCs, housing finance companies.¹ These entities, while providing similar lending services as banks, usually depend more on wholesale

¹ Following the Financial Stability Board’s (FSB) methodology, the Reserve Bank of India reported that NBFCs and HFCs constitute 99.7 percent of the “shadow banking” sector in India. (RBI 2017).
funding and face less regulation. Mutual funds are key players in this shadow banking ecosystem, mobilizing resources from diverse sources and channeling them to these non-bank financial institutions. During the 2010s, these nonbanks contributed as much as a third or even half of the new credit in certain years, highlighting their growing prominence in the credit market.

4. **Foreign lending and borrowing account for less than 5 percent of assets and liabilities respectively**: The Indian financial ecosystem remains fairly self-contained, with foreign entities playing a minor role. Foreign banks contribute a small percentage of total credit, while banks’ international assets constitute about 3 percent of total assets, and international borrowing stands at around 5 percent.

5. **Credit access across India remains uneven, with bank credit to GDP ratios in wealthier states up to three times higher than in poorer ones**: Credit access varies a lot across India, with many regions still facing limited access. Bihar and Uttar Pradesh (where about 1 in 4 Indians live) have credit-to-GDP ratios between 25-30 percent, compared to the national average of over 55 percent. This stark contrast highlights the critical need to increase credit access and financial inclusion, which can stimulate further economic development.

6. **Borrower-lender relationships play a crucial role**: The Indian financial system, with its plethora of specialized entities, relies heavily on borrower-lender relationships. Consequently, institutional failure or financial channel disruptions can significantly impact the real economy, given these relationships’ essential role in maintaining credit flow.

### 1.2. Recent History: A Financial Snapshot

Historically, development banks or All-India Financial Institutions have been pivotal in providing long-term infrastructure lending. However, in the 1990s, several significant development banks faltered. This led to public sector banks (PSBs) assuming a more dominant role in infrastructure lending.

Throughout the 2000s, there was a surge in infrastructure lending in India due to the country’s escalating infrastructure requirements. Public-private partnerships thrived during this period, and Indian banks, especially PSBs, ramped up their project finance involvement. By 2014, due to their widespread

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2. The FSB defines shadow banking as “credit intermediation involving entities and activities outside the regular banking system” (FSB 2012). The FSB states that “the use of the term ‘shadow banking’ is not intended to cast a pejorative tone on this system of credit intermediation. The FSB has chosen to use the term “shadow banking” as this is most commonly employed and, in particular, has been used in the earlier G20 communications.”
presence nationwide and their significant role in infrastructure lending, PSBs provided about 70 percent of total bank credit to the real economy.

This period also marked significant growth in total bank lending from both private and public banks. From 2005 to 2013, the total bank lending expanded by over 15 percent annually in real terms. Notably, banks’ engagement in major infrastructure projects continued to rise, even against the backdrop of the global financial crisis of 2007-09.

However, by the early 2010s, the banking system faced challenges. Governance lapses in infrastructure projects significantly increased the risk of stressed assets in PSBs, and the system experienced a credit misallocation problem known as loan evergreening or “zombie lending.” Under-capitalized banks rolled over loans to large, struggling borrowers to avoid declaring them as non-performing assets (NPAs). By 2016-17, these large borrowers constituted over half of the bank loan portfolios and almost 90 percent of NPAs in the banking system.

Recognizing the severity of this challenge, the Reserve Bank of India (RBI) prioritized addressing the non-performing assets problem in the mid-2010s. A pivotal development was the asset quality review, a regulatory exercise aimed at identifying and rectifying discrepancies in loan classification by banks. This process revealed substantial underreporting of non-performing assets, leading to a collapse in public bank lending. The sudden decline in credit availability created a vacuum that spurred the growth of shadow banks, or non-bank financial companies (NBFCs), which witnessed a surge in lending activity.

The subsequent demonetization on November 6, 2016 impacted the financial system by inducing an abrupt and substantial reduction in cash circulation. This move generated both short-term and long-term effects on various sectors, including shadow banking and real estate. Despite the initial liquidity crisis, demonetization indirectly benefited shadow banks by increasing deposits in the formal banking system and lowering interest rates, thereby boosting demand for credit from NBFCs.

The Indian financial system faced additional challenges with the high-profile defaults of Infrastructure Leasing & Financial Services (IL&FS) and Dewan Housing Finance Limited (DHFL) in 2018 and 2019, exposing the vulnerabilities within the shadow banking sector. These defaults set off a contagion effect, culminating in a liquidity crisis and loss of confidence in NBFCs, ultimately intensifying the economic slowdown.

The COVID-19 pandemic struck at a time when the Indian financial system was already grappling with these vulnerabilities. The pandemic’s unprecedented disruption to economic activity and trade led to widespread job losses, business closures, and further strain on an already fragile financial sector. The government and the RBI implemented several unprecedented measures to cushion the economy. These included fiscal stimulus packages, moratoriums on loan repayments, and liquidity injections. However, the pandemic also introduced
new challenges, including a delay in the repair of the financial system that was needed after the shadow banking crisis.

As the country navigates the post-pandemic landscape, it is crucial to address both pre-existing issues and those that emerged during the pandemic in order to ensure a resilient financial system capable of supporting India’s growth and development goals.

1.3. The Indian Financial Crisis of 2018-20

The events that unfolded in India between the September 2018 and March 2020, although not widely recognized at the time, bear the hallmarks of a financial crisis. This notion may court controversy, but let’s examine why it holds true.

A financial crisis is often characterized by severe disruptions in financial intermediation, widespread defaults, and panic-driven runs on banks. During this period in India, an unusual run on shadow banks occurred. Large institutional depositors withdrew from mutual funds, leading to a startling contraction in funding for commercial paper and debt markets, thereby disrupting financial intermediation. The subsequent defaults by IL&FS in September 2018 and DHFL in June 2019 caused a palpable sense of panic in the market, akin to a traditional bank run leading to severe economy-wide damages.

In labeling this a 'financial crisis,' my intent is not to alarm but to inspire a deeper exploration of these events. The financial sector is poised to play an instrumental role in India’s growth narrative, yet it often remains sidelined in policy discussions. This could be due to the public’s limited exposure to financial affairs. But by bringing these issues to the forefront, I hope to breach this barrier, encouraging everyone to engage in this critical dialogue and contribute to the discourse on India’s financial future.

India’s shadow bank run differed from a classical bank run, with large institutional depositors (e.g., corporates) withdrawing placements in mutual funds, which in turn ran on shadow banks by withdrawing funding from commercial paper and debt markets. Two system-wide runs occurred within months of each other, each triggered by a shadow bank default: Infrastructure Leasing and Financial Services Limited (IL&FS) in September 2018, and Dewan Housing Finance Corporation Limited (DHFL) in June 2019.

The total loss mutual funds incurred because of their exposure to IL&FS and DHFL was around Rs 0.025 trillion for each, adding up to roughly 0.2 percent of mutual fund assets or 0.01 percent of GDP. However, these minor exposures caused major stress, resulting in similar dynamics as traditional bank runs. This led to massive system-wide outflows from the mutual fund industry. In response, mutual funds drastically cut funding to shadow banks, which subsequently reduced credit flows to the real economy. Due to inter-

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3. As a guide to units used in this paper note that Rs 1 lakh crore corresponds roughly to US$13 billion or about 0.5 percent of GDP in late 2010s.
linkages between traditional and shadow banking systems, problems spread to traditional banks after DHFL’s default, causing a steep decline in lending.

This raises two central questions regarding India’s economic slowdown (Figure 2). First, why did the defaults lead to system-wide stress and such large outflows from mutual funds? Second, why did a relatively small shock have such a large, negative, economy-wide impact?

The paper seeks to answer these questions by examining the mechanisms that: (1) led to the two system-wide runs on the shadow banking system and (2) amplified these runs economy-wide. The explanation revolves around a series of mechanisms that I refer to as “India’s macro-financial spiral” (Figure 3).

In brief, the IL&FS group defaulted on its debt obligations in September 2018. Rated AAA until its default by some credit rating agencies, the default shocked the financial system. Fears and uncertainties about hidden vulnerabilities in NBFCs and infrastructure/real estate sectors led lenders to reassess risks (circle 1 of Figure 3).

This initiated a flight to safety, starting with a system-wide run on the shadow banking system. The reasons include varying practices across mutual funds in valuing IL&FS debt and inconsistent timing of haircuts on such securities. This created a first-mover advantage, similar to a classic bank run, prompting investors to withdraw from mutual funds (circle 2 of Figure 3).

**Figure 2. Pre-Pandemic Growth in Real GDP and Investment**

**Source:** NSO.

**Note:** Investment is defined as Gross Fixed Capital Formation plus Changes in Stocks. Quarterly data from NSO.
**F I G U R E 3.** How the Indian Financial Crisis of 2018-20 Unfolded

**India’s Macro-Financial Spiral**

- **Run on Shadow Banking System**
  - Lenders Reduce Exposure to Potentially-Exposed Mutual Funds, Who in Turn Cut Funding to NBFCs/Banks

- **Uncertainty & Flight to Safety**
  - Fears about Hidden Vulnerabilities in NBFCs/Real Estate/Infra. Sector Force Lenders to Reassess Risks

- **Defaults Spread to Supply Chain**
  - In turn, Vendors & Lenders Exposed to Affected Firms/Borrowers are Hurt; Vulnerabilities Rise

- **Liquidity Hoarding...**
  - Forced to Preserve Liquidity, NBFCs/Banks Cut Fresh Lending, Hurting Borrowers that Rely on them

- **...Creates Insolvency Risks**
  - Unable to Access Funding, Borrowers/Firms Delay Payments to Suppliers; Ongoing Projects Stall

**Source:** Author’s calculation.

**F I G U R E 4.** Domestic Flow of Funds to the Commercial Sector

**Domestic Flow of Funds to the Commercial Sector**

(Percent of GDP)

<table>
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<tbody>
<tr>
<td>10</td>
<td>8</td>
<td>6</td>
<td>4</td>
<td>2</td>
<td>0</td>
<td>-2</td>
</tr>
</tbody>
</table>

**Source:** RBI, Author’s estimations.

**Note:** India’s Fiscal Year (FY) is April to March. Thus, FY2019-20 (April 2019-March 2020) bears minimal impact of the pandemic since India’s lockdown began in the last week of the fiscal year on March 25, 2020.
Limited funding access forced NBFCs to hoard liquidity and reduce new lending, impacting borrowers and real estate developers (circle 3 of Figure 3). As a result, credit growth slowed down, affecting the real economy, especially those sectors that relied heavily on shadow banking for credit. The real estate and construction sectors were hit particularly hard, given their dependence on NBFCs and HFCs for financing.

The slowdown in the real estate and construction sectors led to a decrease in aggregate demand, putting further stress on the economy (circle 4 of Figure 3). This economic stress, in turn, led to lower corporate revenues and reduced repayment capacity, increasing the risk of further defaults in the shadow banking system (circle 5 of Figure 3).

The increased risk of default fueled the flight to safety, reinforcing the cycle of stress in the financial system (circle 6 of Figure 3). This feedback loop between the financial system and the real economy created a macro-financial spiral, amplifying the impact of the initial shock from the defaults of IL&FS and DHFL.

A few months later, the default of DHFL restarted this spiral, with the impact this time also spreading to banks, as the default of DHFL deepened worries about the entire financial system’s cross-exposures to the troubled NBFC and the real estate sectors.

To understand the sequence of events and to recognize how big and severe the credit crunch was, it is useful to examine the decline in credit flow to the system in more detail (Figure 4). One can break down the decline in credit flow into three phases. Phase I corresponds to the crunch in public sector lending after the introduction of an asset quality review (AQR) of banks in 2015. Phase II corresponds to the crunch in lending from NBFCs after the default of IL&FS in September 2018. Phase III corresponds to the crunch in overall lending after the default of DHFL in June 2019. The paper discusses each phase in detail. In all that follows, it is important to remember the magnitude of the collapse in domestic lending to the private sector, which fell from nearly 10 percent of GDP in fiscal year 2018–19, to roughly 3 percent in FY2019–20 (i.e., excluding funds from the capital markets).

Some Puzzles

In addition to answering the two questions posed above, the paper also attempts to answer some enduring questions about the growth slowdown, including: (1) why did the problems in the NBFC sector spill over to the traditional banking system?; (2) Was there still a liquidity shortage despite significant quantities of aggregate liquidity creation by the RBI?; (3) Did credit flow fall due to a lack of credit supply or credit demand?; (4) Why did monetary policy transmission to deposit and lending rates weaken?; and (5) Why did the government securities yield curve steepen?
In responding to these questions, one key theme will be the role of asymmetric information. Due to heightened uncertainty about the solvency of some NBFCs, adverse selection issues may have gripped the market (Akerlof 1978). In turn, the NBFCs and other financial institutions exposed to them were being compelled to send a credible costly signal to project strength to the market (Spence 1978). Thus, amid the uncertainty, financial institutions were compelled to demonstrate strengthening of their loan books and addressing of asset-liability mismatches, at the cost of sacrificing fresh lending.

Another key theme will be a shortage of funding liquidity in the system. The liquidity crunch is also a central explanation in the authorities’ own diagnosis presented in the 2019-20 Economic Survey of India chapter titled “Financial Fragility in the NBFC Sector” (GOI 2020). Like many central banks, the RBI has tools to inject funds into the banking system, but the effectiveness depends on whether this liquidity reached all critical parts of the financial system. During fiscal years 2018-20, the RBI’s liquidity strategy focused on (1) injecting significant aggregate liquidity into the system through open market operations and (2) encouraging banks in turn to channel the “excess” aggregate liquidity to the NBFC sector and other financial institutions facing liquidity shortages. While helpful, this approach did not sufficiently address liquidity shortages (in the pre-pandemic period)—which persisted in various key pockets of the financial system and triggered liquidity hoarding by NBFCs and banks alike.

1.4. Fighting the Crisis & the Pandemic

In Part IV, I review the government’s policy responses in 2018 and 2019, as well as the COVID-19 emergency response and significant policy reforms from the past five years.

From implementing accommodative monetary policies and emergency liquidity provisions to introducing loan repayment moratoria and credit guarantee schemes for MSMEs, the authorities implemented a wide range of measures to fortify the economy. These measures were instrumental in strengthening the financial system and ensuring its continued functioning even in the face of unprecedented challenges.

Moreover, these concerted efforts did more than just strengthen the financial system domestically. They also acted as a protective shield, insulating the Indian financial system from the adverse circumstances that led to the collapse of several Western banks in 2023.

While the global banking sector was grappling with a series of bank failures after the default of Silicon Valley Bank in March 2023, the Indian financial system, fortified by proactive repair and restructuring initiatives, demonstrated resilience. The focus on addressing asset-liability mismatches after the IL&FS default, along with different business models, and the recent restructuring of potentially weak links (such as YES Bank), ensured that Indian banks were well-prepared to weather the global banking storm.
1.5. Reform Priorities

Part V concludes with three post-pandemic challenges India must address to foster a robust financial sector conducive to growth. These challenges include bridging the funding gap between traditional and shadow banks ('The Great Funding Imbalance'), widening credit access across all geographies ('The Financial Deepening Hurdle'), and grappling with the 'Growth Strategy Trilemma' that policymakers encounter when balancing growth, stability, and nurturing national champions. Additionally, the paper touches upon the opportunities borne out of India’s digital payments revolution and the ways to build on important reforms such as the 2016 Insolvency and Bankruptcy Code (IBC).

To tackle these challenges, the paper posits a reform agenda centered on ten policy areas: strengthening regulation and supervision, managing systemic risk, improving asset quality, enhancing the framework for bad loans and bankruptcy, reforming public sector banks, restructuring the financial sector, deepening the financial sector, improving monetary policy transmission, improving the emergency liquidity framework, and supporting real estate transactions. Through these reforms, India can lay the groundwork for a more resilient and stable financial system that bolsters long-term growth and development.

1.6. Related Literature & International Comparisons

The study of macro-financial linkages in India is becoming an expanding area of research. Several scholars and committees have contributed to the discussion around financial reform priorities for India. The Narasimham Committee I (1992) provided recommendations for banking sector reforms, while the Narasimham Committee II (1998) examined financial sector reforms more broadly. The Nayak Committee (2014) analyzed the governance of bank boards in India and made relevant recommendations. More recently, Chari et al. (2019) study the origins of the NPA crisis in the 2010s. Acharya and Rajan (2020) discussed the need for reforms in the banking sector and present a comprehensive set of recommendations. Meanwhile, Gupta and Panagariya (2022) offer a thorough argument for the privatization of public sector banks, providing policy recommendations to support their proposal. I also draw on my recent work on the design of the privatization strategy (Agarwal Forthcoming) and on macro-finance linkages (Agarwal 2022).

Further, Subramanian and Felman (2019) and the 2019-20 Economic Survey of India (GOI 2020) brought early attention to several financial sector vulnerabilities and their associated macro-financial implications. India’s experience adds to the growing body of international evidence that unaddressed financial system stress can result in a broader economic growth slowdown, especially if liquidity problems turn into insolvency issues.
When it comes to international comparisons, this paper draws on the extensive literature on macro-financial issues since the global financial crisis of 2007-09. There are some similarities between the pre-pandemic turmoil in Indian financial markets and the U.S. financial crisis of 2007-09. Both episodes saw an increase in uncertainty and a flight to safety, a run on the shadow banking system, a collapse of the commercial paper market, and significant amplification of the financial shock that affected the real economy (Gorton and Metrick 2012; Kacperczyk and Schnabl 2010). However, one key distinction between the two episodes is that India’s pre-pandemic financial turmoil saw relatively fewer large financial institutions affected. This is reminiscent of the U.S. savings and loans crisis of the 1980s and 1990s, where over 1,000 out of approximately 3,200 savings and loan associations failed. While the resilience of a few big financial institutions prevented the financial turmoil from escalating into a full-blown financial meltdown, it may have initially led to a lack of urgency in policy action. Specifically, there was reluctance to inject targeted liquidity into the troubled corners of the financial system and conduct a diagnostic of the non-bank financial sector to restore confidence.

The recent collapses of Silicon Valley Bank, Signature Bank, and Credit Suisse have generated renewed interest in financial stability issues and macro-financial risks. In this context, India’s experience with managing systemic risks and vulnerabilities in the financial sector can provide valuable lessons for researchers and policymakers. By studying India’s approach to addressing these challenges, other countries can gain insights into effective crisis management strategies and policies to mitigate the risks of future failures.

2. Part I: Three Key Macro-Finance Developments between 2000-2018

2.1. The Rise and Fall of Infrastructure Finance

2.1.1. Shift from DFIs to Public Banks (Before 2010s)

The Decline of Development Finance Institutions

In 1947, when India gained independence, there were few banks capable of offering long-term industrial financing. To catalyze growth, the government founded Development Financial Institutions (DFIs) to supply term finance to various industries, forming the DFI model.

The primary DFIs were the Industrial Development Bank of India (IDBI), the Industrial Credit and Investment Corporation of India (ICICI), and the Industrial Finance Corporation of India (IFCI). By the 1990s, they contributed to 80 percent of project financing (Mathur 2003). IDBI funded infrastructure projects, ICICI provided long-term industry finance, and IFCI financed industrial projects.
The RBI and the government backed DFIs with direct funding and other support. A key funding channel was the RBI’s National Industrial Credit (Long-term Operations) Fund, which supplied concessional loans to DFIs. The DFIs then provided term finance to the private sector at lower interest rates than those for short-term loans to increase the attractiveness of long-term investment in industry and infrastructure.

However, the DFI model faltered in the 1990s. The early 2000s economic slowdown unveiled non-performing assets and governance issues, burdening the government with fiscal costs. Consequently, ICICI merged with ICICI Bank, IDBI became a commercial bank, and IFCI’s net worth turned negative in the early 2000s.

This decline of DFIs happened when the corporate debt market was still underdeveloped (Ray 2015). This prompted public sector banks and NBFCs to take on infrastructure lending in the early 2000s. Government initiatives and regulations supported PSBs in funding long-term infrastructure projects, while large NBFCs focused on infrastructure finance, becoming vital industry financiers.

**Boom Years of Public Sector Banks Lending to Infrastructure**

To meet India’s growing infrastructure needs, the government ramped up investment in the 2000s. Public-private partnerships flourished, and Indian banks increased project finance exposure. With the decline of DFIs, public sector banks (PSBs) played a key role in this expansion of credit to large infrastructure and energy projects. They provided 70 percent of total bank credit to the real economy by 2014.

Between 2005 and 2013, Indian banks rapidly expanded lending, with both private and public banks increasing lending by around 25 percent annually. When external financing decreased during the global financial crisis of 2007-09, bank exposure to large infrastructure projects expanded (Sen 2018).

Despite weakened capital positions and deteriorating balance sheets after 2010, public banks maintained lending growth on par with private banks until FY2013-14, increasing their vulnerability. However, much of this rapid lending eventually became non-performing, setting the stage for Phase I of India’s financial sector challenges.

**2.1.2. Emergence of Stress (2010–14)**

Governance lapses in infrastructure projects, particularly those under public-private partnerships, significantly increased the risk of stressed assets in PSBs, according to Singh and Brar (2016).

The banking system faced a credit misallocation problem by the early 2010s, known as loan evergreening or zombie lending (Acharya 2017). Under-
capitalized banks were rolling over loans to large, struggling borrowers to avoid declaring them as non-performing assets (NPAs).

Both banks and large borrowers had strong incentives to continue evergreening loans. By 2016-17, these large borrowers made up over half of the bank loan portfolios and almost 90 percent of NPAs in the banking system (RBI 2019b). International experience has shown that zombie lending can be costly, as unproductive firms are kept alive by subsidized credit while more productive firms are starved of credit (Peek and Rosengren 2005; Caballero et al. 2008).

The Reserve Bank of India (RBI) recognized this challenge as a priority in the mid-2010s and took steps to address it.

2.1.3. AQR & Addressing the “Stressed Asset Problem” (2014–)

After 2014, the Government of India implemented the 4Rs strategy to restore the health of the banking system. The strategy comprised four components: recognition of NPAs transparently, resolution and recovery of value from stressed assets, recapitalization of public sector banks, and reforms of the public sector banks and the wider financial ecosystem. This marked a significant shift in the banking system.

RECOGNIZE. The asset quality review (AQR) initiated in 2015 was a crucial step to recognize the problem. The RBI withdrew regulatory forbearance on restructured loans and conducted an in-depth inspection of bank loan books. The AQR revealed significant hidden vulnerabilities in the bank balance sheets of both public and private banks. Reported NPAs tripled between March 2013 and March 2017, reaching about 10 percent system-wide. The public sector banks were particularly weak, as shown in Figure 5.

RESOLVE. To resolve and recover value from stressed assets, the Government of India passed the Insolvency and Bankruptcy Code in 2016, which overhauled the insolvency system. The framework was hailed as a landmark reform that aimed to resolve the cases of distressed debtors in a time-bound and creditor-driven manner.

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4. The RBI defines a large borrower as one with aggregate fund-based and non-fund-based exposure of Rs 50 million and above.
6. The analysis presented in Figures 5 and 6 replicates and extends the work presented in (Acharya (2018a), RBI speech. To the best of my knowledge, Acharya (2018a) was the first attempt to highlight and distill the dynamics of PCA and non-PCA banks.
7. Please see https://www.mca.gov.in/Ministry/pdf/TheInsolvencyandBankruptcyofIndia.pdf
**Figure 5. Non-performing Assets of Commercial Banks**

<table>
<thead>
<tr>
<th>Year</th>
<th>Private Banks</th>
<th>Other Public Banks</th>
<th>Public Banks under PCA</th>
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**Figure 6. Lending Growth in Commercial Banks (Percent)**

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<th>Year</th>
<th>Private Banks</th>
<th>Other Public Banks</th>
<th>Public Banks under PCA</th>
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Recapitalize. To recapitalize public sector banks, the Government of India announced a recapitalization package of Rs 2.11 trillion in October 2017. This was a critical step to allay fears about contagion from public sector banks to the rest of the financial system.

Reform. To reform weak banks, the RBI put them under special watch and imposed limits on bank activities, including restrictions on lending and distributing dividends. By the end of 2017, 11 public sector banks and one
private bank were under RBI’s prompt corrective action framework. In addition, on August 30, 2019, the Ministry of Finance announced mergers of public banks, amalgamating 10 of them into four entities. The intervention aimed to protect taxpayer liability by returning public sector banks to profitability and mitigating the need for future government capital injection.

2.1.4. **Sharp Decline in Public Sector Banks’ Lending (2014–)**

After the asset quality review, the lending growth of public banks sharply declined (Figure 6). This was due to three main factors. First, the RBI required lenders to begin insolvency proceedings under the Insolvency and Bankruptcy Code if a borrower was delinquent for 180 days. Initial disciplinary actions were targeted toward the largest defaulting borrowers, which reduced lending as the RBI put an end to the evergreening of loans to large firms. Second, weak banks under prompt corrective action had limits on new lending until they fixed their identified weaknesses. Third, the asset quality review required banks to improve the quality of their assets and reconsider their lending model by moving away from riskier sectors to previously untapped (and potentially safer) segments.

Kulkarni et al. (2019) confirm that the asset quality review and the RBI’s regulatory intervention resulted in a 10 percent increase in recognition of distressed assets, with a more pronounced effect in weaker banks.

Banking sector reform also triggered corporate balance sheet repair, as leverage had grown during the boom years. While reforming the banking system was a much-needed priority, until the repair of banks and corporates was complete, lending from public sector banks to the real economy, particularly to large industries, remained muted.

2.2. Rise of the Shadow Banking Sector and Demonetization

2.2.1. **Non-Bank Financial Companies and Housing Finance Companies**

NBFCs and HFCs are considered shadow banks, making up over 99 percent of the shadow banking sector in India ((RBI 2017)). According to the Financial Stability Board (FSB), shadow banking involves credit intermediation through entities and activities outside the regular banking system (FSB 2012).

While NBFCs and HFCs have different business models, they share the key feature of making loan provisions dependent on short-term funding, as opposed

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8. Following the FSB’s methodology, in the RBI reported that the NBFCs and HFCs constitute 99.7 percent of the ‘shadow banking’ sector in India.

9. The FSB states that “the use of the term ‘shadow banking’ is not intended to cast a pejorative tone on this system of credit intermediation. The FSB has chosen to use the term ‘shadow banking’ as this is most commonly employed and, in particular, has been used in the earlier G20 communications.”
to banks that are mainly deposit-financed.\textsuperscript{10} They largely depend on public funding, with bank borrowings, debentures, and commercial paper accounting for 70 percent of their liabilities.\textsuperscript{11}

NBFCs have become a significant credit provider to the economy, offering up to 20-30 percent of the total flow of credit, especially as conventional banks deal with their stressed asset problem. Certain sectors, such as real estate, SMEs, infrastructure, and vehicle/auto loans, are highly dependent on financing from NBFCs, as shown in Figure 7. NBFCs play a critical role in deploying credit to the real estate sector.

The NBFC sector is dominated by about 263 non-deposit taking systemic institutions (or NBFC-ND-SI), which account for about 86 percent of the system. The government-owned NBFCs, particularly the two largest NBFCs (Power Finance Corporation and REC Limited), hold about 40 percent of total assets as of March 2019.

\begin{figure}
\centering
\includegraphics[width=\textwidth]{Credit_to_Various_Sectors_by_NBFCs_and_HFCs.png}
\caption{Credit to Various Sectors by NBFCs and HFCs (Share of Total NBFC/HFC Credit, as of March 2018)}
\end{figure}

Source: RBI, NHB, and Author’s calculations.

\textsuperscript{10} Compared to several advanced countries, the shadow banking system in India—dominated by NBFCs—remains relatively small, with an estimated 20 percent of GDP in assets in 2019, but it has come to play a critical role in the Indian financial system and economy.

\textsuperscript{11} While about 10,000 NBFCs operated in India in 2019, market share was concentrated in just a handful. The largest 263 (classified as systemically important (SI)) accounting for 86 percent of total sector assets, while the top 50 accounted for about 75 percent of market share. In addition, about 88 NBFCs are allowed to take deposits from the public under some restrictions (called NBFCs-D), and accounted for about 13.7 percent of total assets of the NBFC sector as of March 2019.
Figure 8. Exposure of Banks to NBFCs

Bank Lending
(Year-on-Year Percent Change)

Demonetization →

IL&FS Default →

DHFL Default →

Overall Bank Lending
Lending from Banks to NBFCs

Bank Lending to NBFCs
(Percent of Total Credit)

Demonetization →

IL&FS Default →

DHFL Default →

Source: RBI, Author’s calculations.
As of March 2019, there were 99 HFCs, of which only 18 were deposit-taking. Non-governmental companies owned about 95 percent of the HFC sector assets.

In 2019, the RBI classified HFCs as a type of NBFC, bringing them under the NBFC category. Therefore, this paper often uses the term NBFCs to refer to both. The total assets of large NBFCs and HFCs stood at Rs 46 trillion, or about 25 percent of GDP. Additionally, over 10,000 small NBFCs exist, for which data is limited.

2.2.2. The Rise of Shadow Bank Lending (2013–18)

After the asset quality review, growth in bank lending fell below 3 percent in 2016-17, as banks strengthened their balance sheets and set aside large provisions for bad debts they had just recognized. As a result, strong demand for credit in certain segments of the market remained unmet. This led to two major shifts in credit creation.

First, most new bank credit came from private banks, which emerged from the asset quality review with relatively stronger capital positions, giving them space to lend. Consequently, their share in new lending to the real economy went from about 25 percent to 80 percent by FY2015-16 and to nearly 100 percent by FY2016-17.

Second, the interlinkage between banks and NBFCs increased significantly. The NBFCs often operate in niche markets and geographies where traditional banks are absent. This customer relationship and geographic advantage enabled NBFCs to quickly deploy funds to the real economy, including priority sectors. Thus, instead of solely relying on direct lending, banks (both private and public) found it profitable to channel part of their funds to NBFCs, who in turn lend to the real economy. Demonetization in 2016 accelerated this process.

Bank exposure to NBFCs was concentrated among a few NBFCs, increasing banks’ vulnerability to default by a single large NBFC. By 2018, more than half of bank lending to NBFCs went to the top 10 NBFCs, while the top 30 NBFCs held 80 percent of bank lending (RBI 2019a).

2.2.3. Demonetization and Its Impact (2016–17)

In November 2016, the government announced the sudden invalidation of two widely circulated banknotes, the Rs 500 and Rs 1000 denominations. This move, aimed at combating corruption, black money, and illegal assets,
eliminated a staggering 86 percent of the country’s currency overnight.\textsuperscript{14} The demonetization episode significantly altered the Indian financial system. It led to a surge in low-cost deposits into the banking system, creating an abundance of liquidity. After decelerating for a few years, deposit growth surged to 10 percent during 2016–17, much of which went to the relatively healthier private banks.

The demonetization had two crucial impacts on credit flow to the commercial sector. First, flush with liquidity, the supply of bank credit accelerated in 2017–18, with private banks providing the majority of the incremental credit. Second, commercial banks channeled a significant portion of the excess liquidity to the NBFCs (as discussed above). Post-demonetization, lending from banks to NBFCs rose from 0 percent to about 60 percent year-on-year. As a consequence, bank exposure to NBFCs rose from just below 5 percent at the end of 2016 to about 8.5 percent by the end of 2019, as shown in Figure 8.

Before the troubles in IL&FS emerged, two types of fragilities had become entrenched in the system.

- First, NBFCs evolved to have opaque balance sheets, some with risky exposure to real estate developers, home loans, and infrastructure projects, which were increasingly being funded by runnable short-term debt instruments and credit lines from banks. This combination of opacity and asset-liability mismatch exposed them to significant run risk, setting the stage for Phase II of India’s financial turmoil, which was triggered by the default of IL&FS.
- Second, linkages increased between the traditional banking sector and the shadow banking system. This set the stage for Phase III of India’s financial turmoil, which was triggered by the default of DHFL (which is discussed in a later section).

2.3. Increased Exposure to Real Estate

2.3.1. The Rise of Real Estate Lending (2013–18)

The real estate crisis can be traced back to the lending boom in real estate between 2013 and 2018. While public sector banks were focused on restructuring large loans to infrastructure and energy projects, both NBFCs and private banks were providing credit to the economy, much of which was directed to the real estate sector.

According to the RBI’s December 2019 Financial Stability Report, much of the new lending since 2013-14 from NBFCs and private banks went to the

\textsuperscript{14} A few years later, in May 2023, the authorities announced the withdrawal of the 2000-rupee note from circulation. The note, introduced into circulation in 2016, remained legal tender but citizens were asked to deposit or exchange these notes by September 30, 2023.
real estate sector. Their examination of 310 large real estate companies showed that the aggregated exposure of the financial system to the real estate sector had approximately doubled, with housing finance companies and private banks increasing their share sharply. However, this figure might understate the banking system’s exposure to the real estate sector, as it does not account for the indirect exposure of banks to the sector through lending to NBFCs.

**Figure 9. Exposure of Financial System to Real Estate**

![Graph showing exposure of financial system to real estate](image-url)

Source: RBI, Author’s estimations.
Based on supervisory data published by the RBI, the total exposure of banks to the real estate sector (directly and indirectly through NBFCs) grew 14-18 percent annually, despite a sizable fall in overall credit during this period (Figure 9, panel B). The analysis also reveals that the direct exposure of public banks to the real estate sector barely grew over the past few years, but their indirect exposure through NBFCs grew by about 12 percent each in FY2017 and FY2018 and 7 percent in FY2019 (Figure 7, panel A). Thus, the exposure of real estate is not restricted to NBFCs and private banks alone, as some public banks also have exposure to real-estate-focused NBFCs (RBI 2019a).15

At the peak of the real estate sector lending cycle, banks found themselves exposed to real estate in three ways: (1) direct lending to real estate developers, (2) indirect exposure to NBFCs highly exposed to real estate developers, and (3) mortgage and personal loans to individual borrowers collateralized by real estate.16

2.3.2. Negative shocks to the real estate sector and downside risks

The Indian real estate sector was already under pressure before the IL&FS default. The government implemented the Real Estate Development and Regulation Act (RERA) in May 2017, which required developers to keep advance payments in a dedicated bank account. This regulation squeezed a key source of working capital for the sector.

After the IL&FS default, fresh lending to the real estate sector declined sharply, leaving many projects stalled and resulting in unfinished construction sites, unpaid vendors, laid-off workers, and buyers who had pre-purchased units without homes. In September 2019, the stock of unfinished housing inventory in 35 top cities was estimated to be nearly 1.3 million units, with nearly 1 million concentrated in the largest eight cities alone.17 Worse, the stock of unsold inventory in these cities had grown by 5 percent year-on-year since September 2018, when the NBFC shock began. Based on the sales rate at the time, it would have taken approximately 3 years to sell off the unsold inventory, which was especially high in major cities such as Mumbai, Delhi, and Chennai (Figure 10). In addition, housing prices were under pressure pre-pandemic due to excess supply, leading to a contraction since mid-2019 when adjusted for inflation (Figure 11).

15. Moreover, the report found that “the flow of funds to the sector has continued, notwithstanding a general slowdown in credit growth documented earlier. Since September 2018, when the IL&FS induced risk aversion was noted, all categories of financial intermediaries have increased their exposures to REs (real estate companies), the sharpest being that of HFCs.”

16. Note that given the size and diversity of the Indian economy, we must appreciate variations within sectors. In this context, while several developers were under stress, non-negligible demand remained in some geographies and segments (such as for affordable housing).

Excess supply put pressure on real housing prices, which declined after mid-2019. The rise in stalled real estate projects raised serious concerns about some banks and non-banking financial companies (NBFCs). The illiquidity problems of real estate developers had turned into insolvency problems, with non-performing loans already on the rise in the sector. Moreover, worries remained about potentially bigger write-downs in the future. Underwriting standards may have loosened in recent years, as the financial system accelerated lending to
the real estate sector, while leverage on developers’ and buyers’ balance sheets increased significantly, leading to high debt servicing burdens relative to their incomes. These concerns around the financial system’s exposure to the real estate sector were driven by both a higher risk of default and lower recovery rates.

Exposure was sizable, amplified by the intricate interconnectedness between banks and NBFCs. Fitch Rating’s India division estimated that about $10 billion (or 0.4 percent of GDP) of developer loans were due for repayment in the first half of 2020, with several NBFCs and banks directly exposed to these loans. Banks also had sizable indirect exposure through their lending to the NBFCs. Therefore, a rise in defaults in these loans could have had a significant impact across the financial system.

3. Part II: The Defaults of IL&FS and DHFL (2018 and 2019)

3.1. IL&FS Default and NBFC Lending Collapse (2018)

3.1.1. The IL&FS Default: June–September 2018

IL&FS had been established in 1987 as an infrastructure project finance company. However, over time, the company expanded to become a conglomerate with 302 entities, with a focus on infrastructure development and financial services (Figure 12). By March 2018, the group’s reported assets had grown to Rs 1.2 trillion (about 0.7 percent of GDP), making it one of India’s biggest companies. IL&FS had a wide range of stakeholders, including private and foreign partners, and a significant stake from state-owned companies.

IL&FS was involved in both financing and developing infrastructure projects. However, many of the group’s infrastructure projects had long investment horizons (often over 10 years), which it initially financed through medium-term loans from banks. Banks had become less willing to roll over these loans in recent years, leading IL&FS to increase its reliance on short-term borrowing by issuing commercial paper and debentures. By March 2018, 35 percent of IL&FS liabilities were due to be paid to creditors within 12 months. Additionally, IL&FS was operating with very high leverage, with a debt-to-equity ratio reaching 17:1 by March 2018. The combination of an asset-liability maturity mismatch, high dependence on short-term wholesale funding, high leverage, an opaque balance sheet, governance concerns, and large exposure to stressed infrastructure/real estate sectors created a perfect recipe for a financial tragedy.

In June 2018, a subsidiary of IL&FS delayed the repayment of inter-corporate deposits and was unable to service some debt obligations. This led rating agencies to downgrade some of IL&FS subsidiaries below investment

18. Based on reported current liabilities as a share of current and non-current liabilities in the consolidated financial statement in the 2018 annual report.
19. This information is based on “IL&FS: One Year Progress Report” of October 1, 2019.
Complex pyramid structure with 302 entities

Source: IL&FS.
grade in July, putting funding pressures on the group (although still rated AAA). On September 4, 2018, it was revealed that the IL&FS group and its subsidiary had defaulted on short-term bank loans of Rs 1,000 crore and Rs 500 crore, respectively, to a development finance institution (SIDBI), followed by a series of defaults in subsequent weeks. By the end of September 2018, IL&FS had external borrowing of almost Rs 1 trillion, making it a systemic player with significant exposure to the financial system and to public sector institutions. Public banks and institutions held a majority of IL&FS debt.20 The moment of reckoning arrived on September 21, 2018, when fears about widespread defaults by IL&FS shook markets, affecting the commercial paper market and mutual funds. The 30-share Sensex index fell 1,128 points before partially recovering, while non-banking financial companies (NBFCs) were hit hard, with the DHFL share price falling 60 percent at one point in intraday trading.

To calm markets, the Reserve Bank of India (RBI) and the Securities and Exchange Board of India (SEBI) issued a rare joint statement emphasizing that they were closely monitoring the situation and stood ready to take action if necessary. To contain the risks to the system and avoid contagion, the Government of India filed a petition before the National Company Law Tribunal (NCLT) against the IL&FS Board. The NCLT allowed the government to supersede the previous board of IL&FS and appoint a new board to carry out an orderly resolution of IL&FS, motivated by substantial public interest in ensuring such an outcome. At that stage, a further wide-scale default from the group would have threatened financial stability in addition to direct adverse impact on the real economy due to IL&FS’ prominent role in the infrastructure sector.

3.1.2. The Collapse of NBFC Lending (2018-2020)

The NBFC sector suffered system-wide disruption following the collapse of IL&FS. Funding costs for most institutions surged, and some struggled to access funding markets, while those with strong fundamentals maintained access at higher costs. To make up for the shortfall, NBFCs increasingly turned to bank financing between March 2018 and March 2019. This shift saw bank lending increase from around 24 percent to 30 percent of total lending, while debentures’ share fell from around 50 percent to 40 percent. The cost of borrowing in the commercial paper market spiked for NBFCs, and their issuance of commercial paper declined sharply.

The IL&FS crisis highlighted two types of vulnerability in the NBFC sector. Firstly, it exposed funding vulnerabilities for some NBFCs with sizable asset-liability mismatches, which made those with a greater need to roll over short-term debt exposed to unforgiving investor sentiment immediately after

20. According to a petition filed before the NCLT by the Government of India an estimated Rs 0.57 trillion of IL&FS debt obligations, out of over Rs 0.9 trillion, is from public sector banks and institutions.
the default. Secondly, concerns mounted over credit risk in NBFC loan books. NBFC lending had grown rapidly, and the IL&FS shock prompted investors to scrutinize their asset quality before funding them. It brought attention to asset quality concerns and exposure of NBFCs to the ailing infrastructure and real estate sectors. With easy access to funding cut off for most NBFCs, the sector as a whole slowed down its lending plans, clogging another important flow-of-funds channel to the real economy. This, in turn, triggered a liquidity crunch across the entire economy, with the liquidity problems morphing into insolvency problems, leading to more defaults and further deterioration in corporate/financial sector health. This macro-financial spiral is discussed further in a later section.

3.2. DHFL Default and Aggregate Lending Collapse (2019)

3.2.1. Vulnerabilities in Banks Exposed to NBFCs Emerge

During Q2 2019, concerns mounted about the potential spread of shadow banking troubles from NBFCs to the broader financial system. Banks’ quarterly results released in April 2019 revealed ongoing issues with stressed assets and brought greater clarity to exposures between banks and NBFCs. This prompted markets to scrutinize bank lending to NBFCs and focus on banks with exposure to stressed groups such as DHFL, IL&FS, and Reliance Housing.21 In response, the RBI directed banks to disclose their loans outstanding to IL&FS and the provisions required against this exposure, highlighting the linkages between banks and NBFCs.22 As a result of the increased scrutiny, bank stock performance diverged, with the market differentiating between supposedly healthier banks and the rest.

3.2.2. The DHFL Default: June-August 2019

Dewan Housing Finance Corporation (DHFL), incorporated in 1984, provided loans for housing and residential properties, loans against property, construction and project finance, and SME lending. The company’s focus on tier II/III cities and suburban areas of metropolitan cities allowed it to provide financing to an urbanizing India. As of March 2019, DHFL had about Rs 1.2 trillion in assets (or 0.63 percent of GDP).

DHFL faced trouble following the IL&FS default, which highlighted NBFC asset liability mismatches and growing concerns about liquidity and credit risks. The IL&FS default caused a sharp increase in yields of debt paper issued by NBFCs, including DHFL, in the secondary market. The effectiveness of credit

rating agencies’ due diligence was also questioned in light of IL&FS’s AAA rating, adding to uncertainty about hidden vulnerabilities in NBFCs, especially those exposed to the ailing real estate sector.23

Following the IL&FS debacle, credit rating agencies became more vigilant. In February 2019, DHFL’s short-term debt instruments were downgraded, and the company’s managing director resigned. Funding pressure on DHFL surged as it struggled to roll over its short-term debt, resulting in further rating downgrades. By May 2019, the company stopped accepting and renewing fixed deposits due to a credit rating revision.

Despite its efforts to shore up liquidity, DHFL was unable to find a strategic investor, sell significant portions of its loan book, or draw liquidity from bank credit lines or the debt market.

DHFL’s default on its interest servicing obligations on June 4, 2019, triggered a series of payment defaults and a downgrade of its debt issuances to default by rating agencies. The mutual fund sector was hit hard, with several funds exposed to DHFL experiencing a decline in net asset value (NAV) and investors pulling out their money. The outflow of funds caused a major disruption in India’s wholesale funding market.

In the following months, DHFL continued to default on its payments and entered into talks with creditors and bondholders to restructure its debt. However, the company was unable to find a strategic investor to restore investor confidence or draw liquidity from bank credit lines or the debt market. On July 15, 2019, DHFL reported significant losses and defaults in its regulatory filings.

3.2.3. Contagion to the Rest of the Financial System: Summer–Autumn 2019

DHFL’s series of defaults caused concerns about the exposures of banks and debt funds to DHFL and other NBFCs. The mood in the financial markets was already grim, with Punjab National Bank reporting a second instance of fraud worth $0.55 billion. Benchmark equity indices took a hit, and banking and NBFC stocks sold off sharply. Altico Capital, a real estate-focused NBFC, defaulted on external commercial borrowing on August 12, 2019. Eight days later, insolvency proceedings were initiated against Housing Development and

23. According to the RBI’s December 2019 Financial Stability Report (RBI 2019a): “Over the last year, there have been growing concerns over the liquidity and credit issues at NBFCs and HFCs, starting with defaults on short term obligations by IL&FS followed by a sharp rise in the yields of certain debt papers issued by DHFL in the secondary market. These episodes have warranted a review of the framework under which credit rating agencies (CRAs) are operating. Inability to detect emerging financial troubles in the IL&FS group on time has also raised questions on the effectiveness of due diligence by CRAs. In November 2018, in its continued efforts to enhance the quality of disclosures made by CRAs and strengthening the rating framework, Securities and Exchange Board of India issued various guidelines to CRAs such as disclosure of parentage support, group companies and a specific section on liquidity.”
Infrastructure Limited (HDIL), a real estate firm, for failure to repay Rs 522.3 crore, affecting the balance sheets of several banks exposed to HDIL.24

Subsequently, hidden exposures of Punjab and Maharashtra Cooperative (PMC) Bank to HDIL were revealed, prompting the RBI to place the bank under directions to protect its funds and prevent erosion. These developments crystallized concerns about the banking-NBFC-real-estate nexus and deepened investors’ worries about the entire financial system’s cross-exposures to the troubled sectors.

Meanwhile, DHFL was in discussions with creditors throughout the summer, but by September, it was evident that the resolution had stalled, and creditors and bondholders were unable to reach an agreement. To expedite the resolution of DHFL, the Government of India introduced a special interim framework for insolvency resolution of financial service providers under the Insolvency and Bankruptcy Code (IBC) on November 15. To contain systemic risks, the RBI superseded the DHFL Board of Directors on November 20 and appointed an administrator to expedite the orderly resolution of DHFL under the IBC. DHFL became the first financial company to be referred to the NCLT under the code.

3.2.4. Aggregate Lending Collapse (2019Q3 to 2020Q1)

The DHFL and Altico defaults and troubles at Punjab and Maharashtra Cooperative Bank could be compared to a quick sequence of undersea earthquakes. While they were widely reported, their immediate impact was not felt nor fully understood by the wider economy. Nevertheless, the occurrence of these events—in the shadow of the IL&FS collapse less than a year earlier—forced a major re-assessment of risks in the system.

In the aftermath of these events, the financial markets were gripped by high uncertainty and flight-to-safety behavior—as if they were waiting for the tsunami to come. They crowded onto the limited space on the highest peak possible, abandoning any ground that could possibly be hit by the incoming tsunami. Thus, the ample liquidity available from RBI operations flowed to the strongest firms, while investors remained averse to firms/banks that may be exposed to vulnerable sectors/borrowers. A situation of “too much money chasing too few good assets” materialized—with the strongest firms/banks outperforming the rest by a big margin.

In turn, this led banks and NBFCs to predominantly focus on demonstrating to the markets that they had strong fundamentals. Thus, banks and NBFCs prioritized balance sheet repair and strengthening asset-liability matching rather than fresh lending. These dynamics led to a total collapse of lending in

24. Later, in October 2019, lenders to Housing Development and Infrastructure Limited learned that they must set aside provisions for their entire exposure to the real estate developer, as required by RBI’s prudential norms when a borrower is classified as fraudulent.
the system, with nearly no new lending coming from banks or NBFCs to the commercial sector (see Figure 4).

Figure 13 provided a timeline of events presented thus far and explained the macro-financial linkages in the Indian system. The numbered events (in black boxes) referred to the following sequence of events:

1. Before the NBFC shocks, a significant share of public banks was already under the prompt corrective action framework, which placed supervisory limits on bank lending, restricting bank loan growth from the scheduled banking sector.
2. Meanwhile, post-demonetization restrictions on cash transactions and income tax regulations discouraged informal money lending channels, leading to a decline in the volatility of cash.
3. The IL&FS default created fear of hidden vulnerabilities and forced lenders to re-assess risks in NBFCs and, in particular, sectors such as real estate and infrastructure, leading to a run on the money market/debt mutual funds potentially exposed to the troubled NBFCs/sectors.
4. Mutual funds and banks cut exposure to potentially troubled NBFCs/sectors to reassure customers, leading to a crash in commercial paper and short-term debt markets.
5. More robust NBFCs, striving to stand out from their weaker counterparts, focused on strengthening their loan books and liquidity positions, which curbed fresh lending.
6. Borrowers and sectors highly dependent on NBFCs were impacted, ongoing projects stalled, and liquidity problems gradually turned into solvency problems across the supply chain.
7. A second NBFC default, of DHFL, led to another re-assessment of risks in mutual funds and commercial bank exposure to NBFCs and real estate, leading to a second run on mutual funds, with the problem now spreading to private sector banks.
8. Under pressure, the commercial banks were forced to improve liquidity and contracted lending to the private sector.

4. Part III: Why the Defaults Led to a Slowdown: Macro-Finance Spiral

Part II of the paper highlighted the significant stress in the Indian financial system, leading to increased uncertainty and flight-to-safety behavior, ultimately affecting funding costs, credit flows, and the overall economy. This part explains how the financial stress has amplified impacts on the real economy through the macro-financial spiral (Figure 3).
STYLIZED FLOW OF FUNDS IN INDIAN ECONOMY BETWEEN LENDERS AND BORROWERS

NET BORROWERS: Households (Retail Lending), Firms (Commercial Lending), Government (G-Sec.)

Potentially Troubled NBFCs
(including HFCs, CICs, etc.)

Healthy NBFCs
(including HFCs, CICs, etc.)

Deposit Taking Banks
(Private Banks, PSUs, Cooperatives, etc.)

Capital Markets
(Mutual Funds, Insurance, Equities, Debt)

Informal Money Lending
(Cash Lending, B2B, P2P)

NET LENDERS: Household Deposits and Savings, Corporate Treasures, SOE Accounts

Source: Author’s calculations.
Note: Red arrows indicate clogged channels.
Section 4.1 presents evidence of rising uncertainty and flight-to-safety behavior, while Section 4.2 documents the run on the shadow banking system. In Section 4.3, we explore the spillovers to the banking system and liquidity hoarding by banks. Finally, Section 4.4 presents evidence of the broader economy-wide impact of financial stress and the amplification of the financial shock in the real sector.

4.1. Rise in Uncertainty and Flight to Safety

To document the rise in uncertainty, flight to safety, and demand for liquidity, this section presents four types of evidence.

4.1.1. Evidence 1: Rise in Credit Spreads

One method to assess the increased demand for safety or liquidity is by examining the spread between AAA-rated bonds and the yield of 10-year government securities (G-Secs). Although AAA-rated bonds are viewed as low-risk, their yields are often higher than government bonds with similar maturity—largely due to the safety and liquidity that government bonds provide, especially in times of economic uncertainty. This difference in yield is known as the convenience yield. Krishnamurthy and Vissing-Jorgensen (2012) have quantified this convenience yield, highlighting the special position of U.S. Treasuries among other safe U.S. dollar assets.

In the Indian context, however, the convenience yield may not have the same interpretation due to the non-negligible interest-rate risk associated with government securities, given the size of bank exposure to G-Secs and the high duration of the bonds (Acharya 2018b). Therefore, movements in G-Sec yields can have a significant impact on bank profitability, making them not entirely risk-free for banks (see discussion below). Nonetheless, it is informative to examine the AAA/G-Sec spread around the stress events.

A second measure of the rise in demand for safety is the corporate bond spread between AAA-rated bonds and relatively lower-rated bonds such as BAA, AA, or A-rated bonds. In advanced countries, much of the literature focuses on the BAA/AAA spread (Bernanke and Gertler 1995; Hakkio and Keeton 2009). However, since the Baa market is small and illiquid in India, this analysis will focus on the AA/AAA spread. (The results are similar for the A/AAA spread.)

During good times, the yield on these bonds will exceed the yield on AAA bonds by a small margin, as investors perceive the difference in default risk between AA and AAA bonds to be relatively small. However, during periods of increased risk perception or decreased willingness to bear risk, investors may demand a higher yield on Aa bonds, causing the AA/AAA spread to widen and reflecting a flight to quality. Furthermore, investors may worry that within the A-rated category, some A bonds are riskier than others, leading to a problem
of adverse selection that causes the A rating to move even further above the AAA yield. Therefore, the AA/AAA spread may also capture increases in information asymmetries.

Figure 14 examines the trends in both these measures in India around the key stress events. The two measures provided insight into different aspects of the story. Firstly, after demonetization, the AA/AAA spread fell by about 100 basis points (bps) as large amounts of liquidity entered the financial system, allowing debt markets to easily access funding. In this period, the market perception of relative risk between AA and AAA corporates securities declined. However, this trend immediately reversed after the IL&FS default. With a sharp decline in debt funds, the AA/AAA spread climbed back from about 50 bps to 150 bps in a few months. Then, as the spreads were starting to stabilize at a new equilibrium, the DHFL default occurred, leading to another spike in the AA/AAA spread. As of the end of 2019, Aa rated corporates had to pay about 200 bps more than AAA-rated corporates to borrow in the debt markets. This was 150 bps higher than the spreads observed pre-IL&FS-default.

As for the AAA/G-Sec spread, a similar rise was seen in the spread after the IL&FS default, with the relative borrowing cost for AAA-rated corporates increasing by about 50 bps immediately after. However, the response of the spread after the DHFL default was markedly different, with the spread registering no discernible movement immediately after, and possibly declining
by about 10 bps in the months since. This may be due to the rising fiscal concerns in the second half of 2019, which may have reduced bank appetite to buy long-duration G-Secs (more on this below).

**FIGURE 15. Inter-Bank Spreads**

![Graph showing inter-bank spreads]

Source: CCIL, Author’s estimations.
Note: CCIL, Author’s estimation. Black lines indicate liquidity easing operations by RBI.

**4.1.2. Evidence 2: Rise in Interbank Spreads**

At least two measures of financial stress are relevant from the interbank market perspective: (1) the TED spread and (2) the spread between interbank rates and the policy rate (referred to as the “MIBOR spread” for India).

The TED spread is the difference between the 3-month interest rate on interbank loans and on 3-month government securities (T-Bills). Although not a closely tracked measure in India, this spread has been the focus of considerable literature since the global financial crisis. The MIBOR spread is similar, and is calculated as the difference between the 3-month interest rate on interbank loans and the RBI policy repo rate. Both indicators measure the funding cost that banks charge each other over the short term.

The interbank spreads can be higher than the rate on a Treasury bill or the policy repo rate of the same maturity for three reasons: (1) default risk, (2) liquidity risk, or (3) adverse selection. Default risk arises when lending banks...
are concerned that the loan may not be repaid, while liquidity risk arises when banks anticipate an unexpected need for funds before the loan matures. Adverse selection occurs when lending banks have difficulty assessing which borrowing banks are good or bad risks. These two spreads can capture three distinct aspects of financial stress: flight to quality, flight to liquidity, and asymmetry of information between buyers and sellers of financial assets (Hakkio and Keeton 2009).

Figure 15 portrays the TED spread in India surrounding the critical stress events. The interbank market seems to demonstrate a similar picture of stress as the corporate debt market. After demonetization, the surplus cost of interbank borrowing declined from about 50 bps to zero, as a considerable amount of liquidity entered the system. As re-monetization occurred, this trend partially reversed, but interbank borrowing costs stayed very close to the government’s cost of short-term borrowing. In late 2017, when the RBI imposed the prompt corrective action framework on several banks, the interbank rates’ cost surged immediately by around 100 bps, which was somewhat offset by RBI’s liquidity easing operations. The cost of interbank borrowing increased again by 50 bps immediately after the default of IL&FS, and a similar increase of about 40 bps was observed after the DHFL default. Despite significant liquidity easing operations by the RBI in 2019, the interbank borrowing cost measured by the TED spread stayed elevated, indicating the persistence of strains in the interbank market. This is more evidence consistent with a potential flight to safety behavior continuing to grip the financial system.

4.1.3. Evidence 3: Stock Market Polarization (Stock Market Puzzle)

Large-cap stocks tend to outperform small-cap stocks during flight-to-safety episodes, according to cross-country evidence (Baele et al. 2020). This sheds light on the 2019 puzzle of the divergence between the real economy and equity price indices. The results of this subsection are consistent with this phenomenon.

India’s Sensex and Nifty, consisting of 30 and 50 of the largest firms, respectively, are widely followed benchmark indices. Despite a severe economic slowdown in 2019, the two indices delivered total returns of 15 percent and 12 percent, respectively, leading many to question why.

A prominent magazine, Business Today, even ran a cover story on December 15, 2019, titled The Great Stock Market Mystery: Why the Sensex is on fire even as the economy hurtles downhill?²⁵

Figure 16 illustrates the performance of small, mid, and large-cap firms during 2018-19. The dynamics of the Indian stock market align with flight-to-safety episodes seen in other countries, with large-cap stocks performing

strongly while mid and small-cap stocks lag behind. Since the end of March 2018, the Sensex’s 30 firms’ returns have increased by about 25 percent, while small-cap firms’ returns have dropped by over 20 percent, and even mid-cap firms saw a decline of around 10 percent during this period. Figure 16 shows that polarization began in Q2 2018 and accelerated around both the IL&FS and DHFL defaults. Even in 2019, nearly 80 percent of firms listed on the Bombay Stock Exchange (BSE) experienced negative returns.

Excess aggregate liquidity can exacerbate polarization in asset markets. Cheap liquidity provided by the central bank needs to be allocated to available assets, which, in a polarized environment, leads to an increase in the relative demand for safer assets, further polarizing asset prices between safe and less-safe assets (Agarwal 2022).

**Figure 16. BSE Stock Market Index by Firm Size**

It’s worth noting that the polarization phenomenon in Indian asset markets cannot be attributed solely to NBFC shocks. Rather, these shocks have accelerated a broader trend that has been ongoing since at least 2014. For example, between 2014 and 2019, the share of the top 10 firms in market
capitalization increased from about 14 percent to 23 percent. This suggests that the economic environment over the past few years has favored larger, more established firms relative to their smaller counterparts.

4.1.4. Evidence 4: Yield Curve Movements

Economists have long viewed a decrease in the slope of the yield curve, or term spread, as a reliable predictor of impending recessions (Estrella and Trubin 2006). This phenomenon is often attributed to investors’ anticipation of economic weakness and more monetary policy stimulus, leading to lower short-term rates (Adrian et al. 2013; Favara et al. 2016). During times of high uncertainty and risk, such as during the global financial crisis, government bonds can act as an insurance policy, driving investors to hold bonds even as the term premium approaches zero or becomes negative (Cohen et al. 2018).

**Figure 17.** Slope of the Yield Curve: 10-yr vs 1-yr G-Sec Spread

![Graph of yield curve slope with key events marked: IL&FS Default, DHFL Default, Interim Budget, Change in Liquidity Regulations, External Benchmarking Introduced.]

Source: CCIL, Author’s estimations.

Figure 17 uses data from secondary markets to plot the term spread in India, measured as the difference in yields between the 10-year G-Sec and the

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1-year G-Sec. The term spread flattened significantly immediately following the defaults of IL&FS and DHFL, declining by about 25 bps and 50 bps, respectively. This suggests a temporary surge in demand for G-Secs after the defaults. However, the decline was short-lived as market concerns about fiscal slippage increased.

The behavior of the term spread is consistent with the pattern observed in other credit spreads.

**FIGURE 18. Illustrative Depiction of Flight to Safety Dynamics**

Fiscal concerns are a strong driving force for longer-maturity G-Secs demand, despite having limited default risk—due to the sizable interest rate risk associated with them and their implications for bank profitability. Banks can only classify a certain quantity of G-Secs as held-to-maturity (HTM), shielding them from any valuation changes, and currently, they can only classify around half of their G-Sec holdings as HTM. For the rest, they must book losses when the value of the bonds falls, or when secondary market yields rise. (Acharya 2018b) provides a further discussion on this issue in the Indian context.

G-Secs make up approximately 20 percent of total banking sector assets, and are a vital source of profits for banks, contributing over one-fourth of total profits during certain periods. However, their contribution to profits is volatile.
because of sizable duration risk, whereby the average maturity of G-Secs held by banks is quite high, leading to large valuation changes in the non-held-to-maturity holdings of G-Secs. Therefore, in an environment where bank profits are already under significant pressure, banks require substantial compensation, in the form of risk premium, to hold additional quantities of long-maturity G-Secs.

In addition, Figure 17 demonstrates that the introduction of external benchmarking, which required banks to link their floating rate loans to the RBI policy rate starting from October 1, 2019, had a significant impact on the slope of the yield curve. This was likely driven by the fact that the external benchmarking requirements introduced additional interest rate risk for the banks for their existing loan exposures. This in turn reduced the banks’ appetite to absorb additional interest rate risk, increasing the risk premium associated with duration risk. As a result, long-term yields may have moved up. In a way, this was akin to a “reverse-crowding-out effect,” with government borrowing costs increasing because of the exposure of banks to the commercial sector.

Thus, at that juncture, the flight-to-safety dynamics pushed investors away from both (1) credit risk, and (2) interest rate/duration risk (Figure 18). The combined implication of this was unusually strong demand for shorter-term securities issued by either the government or a few AAA-rated corporates. One fundamentally strong government entity that supplied unlimited quantities of such securities was the RBI through its liquidity window. As seen in the next section, demand by banks for such liquidity instruments shot up.

4.2. A Run on the Shadow Banking System

4.2.1. Overview of Mutual Funds in India

Mutual funds played a central role in financial intermediation in India, mobilizing funds from net savers and channeling them to net borrowers, including nonbanks, banks, governments, and corporates (Figure 11). As one of the main net suppliers of funds to the financial system, they were crucial in nonbank credit creation, with NBFCs relying heavily on mutual funds for funding (RBI 2018).

As of the end of August 2018 (just before the IL&FS default), mutual funds had total assets under management (AUM) of Rs 25 trillion (or about 15 percent of GDP). Half of these resources were with mutual fund schemes investing in debt instruments, such as debt funds or money market funds, while 35 percent were with schemes investing in equities, such as equity funds or ETFs. 27,28

27. The term “money market mutual funds” is used here to refer to both “liquid funds” and “money market funds”.
28. For further details on the industry, please refer to statistics provided by the Association of Mutual Funds in India.
According to the Association of Mutual Funds in India (AMFI) data, debt funds and money market funds typically raised over 90 percent of their funding from institutional investors, such as corporates, banks, and high-net-worth individuals. On the other hand, about half of all investors in equity funds were retail investors, such as regular households. This distinction matters, as international experience had demonstrated that investments from institutional investors were likely to be relatively less sticky and thus more prone to outflows in periods of stress.

**Figure 19. Gap in Mutual Funds AUM**

<table>
<thead>
<tr>
<th>Year</th>
<th>2010m1</th>
<th>2011m1</th>
<th>2012m1</th>
<th>2013m1</th>
<th>2014m1</th>
<th>2015m1</th>
<th>2016m1</th>
<th>2017m1</th>
<th>2018m1</th>
<th>2019m1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rs. Trillion</td>
<td>-1.5</td>
<td>-1.3</td>
<td>-1.1</td>
<td>-0.9</td>
<td>-0.7</td>
<td>-0.5</td>
<td>-0.3</td>
<td>-0.1</td>
<td>0.1</td>
<td>0.3</td>
</tr>
</tbody>
</table>

Source: AMFI, Author’s estimations.

**4.2.2. Exposure of Mutual Funds to Nonbank Financial Corporations before IL&FS**

Immediately after demonetization in November 2016, mutual funds experienced large net inflows as liquidity in the formal financial system surged. According to a simple estimation that compares assets under management in mutual funds relative to the trend observed between 2010 and 2016, mutual funds received excess inflows of nearly Rs 3 trillion between the end of 2016 and mid-2017 (Figure 19).

During this period, mutual funds’ exposure to the NBFC sector also significantly increased. Although the share of debt/money market funds as a share of the total industry remained roughly stable, the composition of their assets shifted considerably toward funding NBFCs and corporates during
2017-18. Securities and Exchange Board of India data show that mutual fund holdings of spread products, such as commercial paper, certificates of deposit, and corporate debt, as a share of total debt assets under management increased from about 10 percent to 25 percent between September 2017 and March 2018. Thus, just before the IL&FS default, the mutual fund industry was one of the main suppliers of credit to NBFCs, with significantly increased exposure to the NBFC sector.

4.2.3. The Impact of the IL&FS Default

According to the Securities and Exchange Board of India, the total exposure of Mutual Fund schemes to the IL&FS group was only Rs 5,200 crore including debt issued by SPVs of IL&FS as on 31st August 2018 that is, around 0.35 percent of the debt AUM (assets under management) of the Mutual Fund industry. This exposure amounted to Rs 0.05 trillion or 0.025 percent of GDP. However, despite this small exposure, the default by IL&FS on its debt obligations led to major stress and a run on mutual funds in September 2018. The default created significant volatility in debt and money market instruments issued by NBFCs/HFCs, which in turn, created redemption pressure on mutual fund schemes that were potentially exposed to the NBFC sector.

Within a month, by the end of September 2018, the assets under management of open-ended debt-oriented schemes declined by about 20 percent. The majority of the outflows occurred in liquid/money-market schemes, where assets under management declined by 35 percent within one month (Figure 19). Overall, the outflows from mutual funds were nearly Rs 3 trillion (or 1.5 percent of GDP) in one month, 60 times the exposure of mutual funds to IL&FS.

4.2.4. Why the IL&FS Default Led to a System-Wide Run: A Crisis of Confidence

After the default, the sector was gripped by fear dynamics. This was similar to the run on mutual funds during the global financial crisis (Gorton and Metrick 2012; Kacperczyk and Schnabl 2010), where a small credit event can cause widespread fear and uncertainty.

Two factors in the Indian context may have contributed to the mutual fund panic. Firstly, mutual funds used varying valuation practices when faced with the downgrade of IL&FS debt securities, resulting in different haircuts being applied. Secondly, the timing of applying these haircuts varied, leading to investor uncertainty about true exposure to IL&FS debt.

This delay and variation in applying haircuts created a first-mover advantage, similar to that seen in a classic bank run. Those who redeemed their funds first would escape the eventual haircut on IL&FS instruments, while those left behind would suffer a larger impact of the haircut and be forced to redeem their funds at a lower net asset value.
Investors were incentivized to panic and withdraw funds from debt-oriented mutual funds. In March 2019, the Securities and Exchange Board of India discussed the impact of IL&FS debt valuation practices by mutual funds. The Board stated that such practice(s) may also have resulted in a first mover advantage with certain investors taking advantage of the gap between the credit event and the date of taking the haircut, by redeeming at a higher NAV.29

To restore the health of the mutual fund sector following the run, the Securities and Exchange Board of India took action, requiring segregated portfolios for debt and money market instruments. In June 2019, new investment norms for liquid and debt mutual funds were also released. These norms mandate that liquid mutual funds must invest at least 20 percent of their corpus in liquid assets such as cash, government securities, treasury bills, and repos on government securities.30

Despite these measures, risk uncertainty remained high in the second half of 2019, with credit spreads not returning to pre-IL&FS levels. This uncertainty was exacerbated by a series of credit events from large corporates and financial institutions, deterring investors from the mutual fund industry.31 The default of DHFL was one such major credit event.

4.2.5. The Impact of the DHFL Default

The restored calm in the mutual fund industry was short-lived as the default of DHFL in June 2019 sent another shockwave. Several mutual funds that were exposed to DHFL saw their net asset values impacted. The collective exposure of mutual funds to DHFL was similar to that of IL&FS before their respective defaults. As of the end of April 2019, mutual funds had a collective exposure of Rs 5,200 crore (or Rs 0.05 trillion or 0.025 percent of GDP). Moreover, it was later discovered that 56 percent of this exposure was concentrated in schemes held by two mutual funds.32

The DHFL default caused a similar shock to the mutual fund industry as the IL&FS case. Within a month, by the end of June 2019, assets under management of open-ended debt-oriented schemes declined by about 15 percent. Liquid/money-market schemes also saw a decline of 25 percent within a month (Figure 19).

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30. Other norms include sectoral limits on liquid funds’ investments and mark-to-market valuation of all debt and money market investments. Further liquid and overnight schemes have been prohibited from investing in short-term deposits, debt and money market investments with structured obligations, or credit enhancements.
31. In several of these episodes, holders of debt were forced to restructure the maturity of their bond holdings, but the eventual write-downs on these exposures were not immediately clear.
The total outflows from mutual funds were nearly Rs 1.7 trillion (or 1 percent of GDP) in a month, which is about 35 times the exposure of mutual funds to DHFL. The second major shock widened the gap in assets under management of mutual funds compared to the pre-2017 trend. By the end of 2019, the mutual fund industry should have been bigger by roughly Rs 2 trillion (or 10 percent), or by Rs 4 trillion (or 20 percent) if one takes into account the positive inflows from demonetization.

4.2.6. The Collapse of Commercial Paper

India’s commercial paper market was restricted to short-term, unsecured promissory notes with maturity up to one year, and only those with a minimum credit rating of A3 are eligible for issuance as per RBI rules. This market serves as a money market instrument for highly rated corporates, NBFCs, and other financial institutions to diversify their sources of short-term borrowing.

At the time of the IL&FS default in mid-September 2018, the total outstanding commercial paper was approximately Rs 6.4 trillion (or 3 percent of GDP), out of which NBFCs had issued around Rs 1 trillion.

The IL&FS default had a severe impact on the commercial paper market in India. In just three months, between mid-September and the end of December 2018, the amount of commercial paper outstanding decreased by about 22 percent. This decline caused the market to contract from Rs 6.4 trillion to Rs 5 trillion (Figure 20). The impact was even more severe for commercial paper issued by NBFCs, which declined by over 70 percent in just two months.

The commercial paper market had begun to recover by Q1 of 2019. However, the default of DHFL was another major blow. Within three months of the DHFL default, commercial paper outstanding had contracted by roughly 18 percent, or Rs 1 trillion.

The contraction of the commercial paper market led to a loss of access to cheaper short-term funds for NBFCs and some corporates. Mutual funds and other investors became wary of unsecured lending, even to highly rated institutions. This created a two-sided run, with corporates and investors running on mutual funds, who in turn ran on debt instruments issued by NBFCs and some corporates.

33. See RBI’s directions on commercial paper for more details: [https://rbidocs.rbi.org.in/rdocs/notification/PDFs/NT43D0D6575DBD184C22B71E-859294DA1969.PDF](https://rbidocs.rbi.org.in/rdocs/notification/PDFs/NT43D0D6575DBD184C22B71E-859294DA1969.PDF)


35. In addition, as per RBI data, banks subscribing to about 20 percent of commercial paper issued, reduced their exposure to commercial paper, with only about 16 percent participation in the market by March 2019. This led the collective participation of mutual funds to increase from about 69 percent to 74 percent over the same period.
These dynamics forced the NBFC sector to abruptly transition from its former business model of borrowing short-term in wholesale funding markets to lend long-term. Instead, apart from a few highly regarded institutions, many NBFCs continued to face difficulty accessing short-term debt markets. This liquidity crunch in the sector was compounded by some rating downgrades over the past quarters. NBFCs were compelled to find longer-term sources of financing and increasingly relied on banks to step in.

RBI’s efforts to address the liquidity crunch may have increased the bank-non-bank linkage as many measures to relax liquidity pressures focused on encouraging on-lending and co-lending by banks to non-banks (which is discussed in more detail below).

4.2.7. Why the IL&FS and DHFL Shocks Led to a Decline in Lending from NBFCs

Based on an analysis of audio recordings of investor earnings calls and related material in the public domain, four broad themes emerge on why the IL&FS and DHFL shocks led to a decline in lending from NBFCs:

- Precautionary saving and liquidity hoarding: NBFCs adopted a precautionary savings mode and paid higher costs to secure ample liquidity. Banks hesitated to lend liquidity to the NBFC sector due to
a lack of confidence. Only a handful of NBFCs/HFCs with excellent governance, high capital adequacy ratios, and strong parental support were able to access funding easily. The rest of the sector remained in need of liquidity. This resulted in NBFCs preserving liquidity, which meant that their target cash balances rose as a share of total assets, leading to less fresh lending to the real economy.

- **Shift in Borrowing Mix Toward Longer-Term Liabilities:** Second, NBFCs aimed to shift their borrowing mix from short-term debt to long-term liabilities and reduce leverage. This aimed to lower refinancing risks in a cautious wholesale funding market. NBFCs worried about rolling over large amounts of short-term debt when market sentiment could change rapidly. As a result, they cut back on commercial paper borrowings and increased long-term debt, primarily from banks. However, not all NBFCs managed to fully replace their short-term liabilities with long-term ones due to tight funding conditions. Consequently, NBFC balance sheets didn’t grow enough—or even shrank—compared to pre-IL&FS shock trends. This slower balance sheet growth impacted the amount of fresh lending by NBFCs.

- **Prioritize Loan Health Over Growth:** Many investors expressed concerns about asset quality, particularly in real estate. NBFC management aimed to maintain the performance of existing loans to prevent them from becoming NPAs. Several NBFC leaders prioritized preserving the health of their current loan book rather than focusing on balance sheet growth and new lending. This approach was mainly driven by NBFCs needing to reassure anxious investors that the issues causing the IL&FS and DHFL defaults were absent from their companies, confirming their fundamental strength.

- **Diversify Portfolio Toward Retail, Away From Real Estate:** Amid concerns about the real estate sector and the perceived strength of retail loans, many NBFCs—including those specializing in real estate lending—began avoiding real estate and increasing their exposure to retail. This segment had relatively low asset quality concerns based on NPA data. The IL&FS and DHFL experiences showed that large exposures to single borrowers could quickly jeopardize financial institutions. Consequently, NBFCs aimed to reduce large exposures to individual borrowers.

In summary, these four factors led to severely constrained fresh lending following the IL&FS and DHFL shock. This dynamic can be viewed through the lens of asymmetric information theory. In the NBFC context, heightened uncertainty about solvency may have led to adverse selection issues in the market (Akerlof 1978). Consequently, NBFCs felt compelled to send a credible, costly signal to showcase their strength (Spence 1978). They focused on improving
**Figure 21.** The Tradeoff between Loan Health vs Fresh Lending

- **Before NBFC Shocks**
  - Strengthen Loan Book and ALM (Signal Strength)
  - Expand Fresh Lending (Boost Market Share)

- **After NBFC Shocks**
  - Strengthen Loan Book and ALM (Signal Strength)
  - Expand Fresh Lending (Boost Market Share)

Source: Author’s calculations.

**Figure 22.** Composition of Interest-Bearing Liabilities of NBFCs (Percent)

- End-September 2017
- End-September 2019

Source: RBI, Author’s calculations.
their loan book and addressing asset-liability mismatches, sacrificing fresh lending in the process (Figure 21).

4.2.8. Overall Impact

The IL&FS and DHFL defaults triggered a major risk reassessment. Uncertainty surrounding mutual funds’ exposure to these entities and the collective exposure to the NBFC sector resulted in significant redemption pressure on the mutual fund industry. Many mutual funds faced severe liquidity challenges, forcing them to de-lever existing holdings, cut exposure to NBFCs, and reduce corporate debt issuance demand.

These developments impacted the NBFC sector and the broader economy. By October 2019, mutual funds’ exposure to NBFCs had dropped about 30 percent since July 2018 (CARE Ratings 2019), making it harder for NBFCs to roll over debt and finance the real sector. The decline in mutual fund funding for NBFCs extended beyond commercial paper, with debenture holdings also decreasing significantly. Between September 2017 and September 2019, wholesale debt financing as a share of NBFCs’ interest-bearing liabilities fell from about 60 percent to 48 percent (Figure 22). This decline included a roughly 7 percentage point drop in debentures and a 5-percentage point drop in commercial paper, with commercial paper reliance nearly halved over this period.

The following section explores the consequences of the NBFC troubles and how these issues spilled over to traditional banking, leading to liquidity hoarding among banks.

4.3. Spillover of Stress to Commercial Banks and Liquidity Hoarding

4.3.1. Funding Structure of Banks: Public versus Private Banks

Indian banks have predominantly followed a traditional model. They raise funds from depositors and market borrowings, then use these funds to lend to firms, households, and financial institutions or to purchase investment securities. Recently, lending to financial institutions, particularly NBFCs and HFCs, increased as a share of total banking assets.

As of March 2019, on the asset side, around 63 percent of banks’ interest-earning assets consisted of loans and advances, while 28 percent were investments (mostly government securities). Meanwhile, deposits accounted for approximately 88 percent of interest-bearing liabilities, with market borrowings making up the remaining 12 percent.36

These overall numbers, however, conceal significant variation within the banking system—particularly between public and private banks in terms of funding structures.

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36. About 60 percent of deposits were term deposits, while the remaining 40 percent were current and savings account deposits.
First, private banks depend more on market borrowing. In March 2019, market borrowing accounted for 17 percent of private banks’ interest-bearing liabilities, compared to 8 percent for public banks. Second, private banks have relatively less access to retail depositors than public banks. In March 2019, retail deposits made up 33 percent of interest-bearing liabilities for private banks and 60 percent for public banks (Figure 23).

**Figure 23.** Composition of Interest-Bearing Liabilities of Banks (Percent, as of March 2019)

![Composition of Interest-Bearing Liabilities of Banks](image_url)

Source: RBI, Author’s calculations.

**Figure 24.** Credit-to-Deposit Ratio of Domestic Banks (Percent)

![Credit-to-Deposit Ratio of Domestic Banks](image_url)

Source: RBI, Author’s calculations.
These features imply that only 1/3 of private bank funding is sticky (retail deposits), while they must actively compete to raise funds from wholesale funding markets, money markets, and large institutional depositors. This reliance on non-retail funding also means that private banks are relatively more exposed to funding risk—either when wholesale or money markets are disrupted or when concerns arise about their own health (e.g., due to asset quality or governance issues). Funding risk is especially relevant for banks that have aggressively increased lending and for newer or weaker banks struggling to grow their retail depositor bases.

4.3.2. Dispersion in Credit-Deposit Ratios

Between 2013 and 2018, private banks maintained strong annual deposit growth of 10-15 percent, while public banks’ deposit growth fell from about 15 percent in 2014 to near zero since then. This divergence reflected the new reality as of March 2019, with public banks having easy access to depositor funding but constrained lending, and private banks seeking to lend more aggressively but without easy access to depositor funding.

After the IL&FS default disrupted wholesale and money markets, private banks were further incentivized to compete for deposits to secure a stable funding base.

Consequently, dispersion in credit-deposit (C-D) ratios of banks in the system increased. Many private banks have lending opportunities but struggle to compete for funds (high credit-deposit ratios), while numerous public banks have lending constraints but access to ample funding (low credit-deposit ratios). Over time, credit-deposit ratios have become more dispersed, with a significant increase for private banks and a decline for public banks, especially after 2015. In fact, the credit-deposit ratio for private banks as a group has remained at or above the 90th percentile level, suggesting that the larger private banks have the highest credit-deposit ratios (Figure 24).

The rise in credit-deposit ratios for private banks since 2013 has been associated with substituting investments with loan advances and greater reliance on market borrowing. Conversely, public banks have gradually increased their investment holdings relative to loan advances.

4.3.3. Shrinkage Interbank Market and Increased Reliance on Market Borrowing

Simultaneously, the interbank market in India continued to shrink, with banks preferring to utilize their resources for loans or investment products (Figure 25). This was partly due to the introduction of new liquidity regulation (the liquidity coverage ratio (LCR)) and, more recently, high uncertainty in the interbank markets. The shrinking interbank markets compelled banks with high financing needs to increasingly rely on market borrowing to fund their operations. In this context, both public and private banks have been actively borrowing in the interbank market.
FIGURE 25. Size of Inter-Bank Market (Percent of Total Banking Sector Assets)

Source: RBI, Author’s calculations.

FIGURE 26. Net Receivables/Payables by Financial Institutions (Rs. Trillions)

Source: RBI. Exposures among entities in the same sector are excluded.
Greater reliance on market borrowing can be seen by examining cross-linkages in the Indian financial system (Figure 26). Mutual funds and insurance companies were the major fund providers to the system, while NBFCs, HFCs, and SCBs were the major receivers of funds. However, experiences varied within the banking system: private banks were net receivers relative to the entire financial sector, while public banks were net fund providers. Private banks’ dependence on the rest of the financial system is similar to that of NBFCs/HFCs, demonstrating their high non-deposit funding needs.

After the IL&FS and DHFL shocks, the divergence in the financial network became more pronounced. The net receivables of mutual funds and insurance companies from the financial sector grew at 12.5 percent (YoY) and 17 percent (YoY), respectively, as of the end of September 2019. Over the same period, public banks’ net receivables declined by 12.4 percent. On the other hand, private bank net payables to the financial system grew 20.8 percent. For NBFCs and HFCs, net payables grew 10.6 percent and 5.5 percent, respectively, primarily due to increased borrowings by public sector NBFCs and large HFCs.

### 4.3.4. **Widened Differentiation in Banking Sector**

Fears of shadow banking trouble spreading from NBFCs to the broader financial system increased in the second quarter of 2019. April 2019’s quarterly results revealed ongoing issues with stressed assets and provided more clarity on bank exposures to NBFCs and the troubled real estate sector. Markets scrutinized bank lending to NBFCs and focused on banks exposed to stressed groups like DHFL, IL&FS, and Reliance Housing. Later in April, the RBI directed banks to disclose loans outstanding to IL&FS and the provisions required against this exposure, sharpening the focus on the linkages between banks and NBFCs. Consequently, bank stock performance diverged as the market differentiated between supposedly healthier banks and the rest (Figure 27).

The DHFL defaults, as well as Altico’s default and Punjab and Maharashtra Cooperative Bank’s troubles (exposed to the defaulting real estate firm Housing Development and Infrastructure Limited), forced a major re-assessment of risks in the system. In the aftermath, financial markets were gripped by high uncertainty and flight-to-safety behavior, amplifying differentiation within banks that had started after the end of March 2019 (Figure 27). This increased scrutiny of asset quality and governance concerns in banks.

### 4.3.5. **Rise and Fall of the Certificates of the Deposit Market**

Before the IL&FS default, the CD market in India had been gradually shrinking. However, after the default, the banking system came to depend more heavily on the CD market for short-term funding, with mutual funds providing much of the short-term funds to banks in this market. The size of the market grew significantly between October 2018 and March 2019, with CDs outstanding increasing from Rs 1.5 trillion to Rs 2.7 trillion—an 80 percent increase (Figure 28).
FIGURE 27. Share Prices of Indian Banks

Share Prices of Indian Banks
(Index: 100 = Dec 31, 2018)

Q4 Results Reveal NPA Issues in Weaker Banks

Source: NSE, Author's estimations.

FIGURE 28. Certificates of Deposits (CD): Amount Outstanding (Rs. Trillions)

Source: RBI.
However, once Q4 results began revealing weaknesses in bank balance sheets in April 2019, the CD market contracted quickly. This contraction accelerated after DHFL’s default. By the end of 2019, CD market growth had almost completely reversed, with CDs outstanding standing at Rs 1.6 trillion in December 2019.

This collapse was symptomatic of the greater problems commercial banks were having in accessing short-term funding. Critically, the collapse triggered major competition for deposits by commercial banks to ensure access to a stable funding base. Unlike the commercial paper market, the issuance of CDs faces no minimum ratings requirement. All banks, independent of their credit ratings, are permitted to issue CDs, and some banks with high funding needs relied sizably on the CD market for short-term borrowing. Banks without large retail deposit bases (and those not among the highest-rated banks) were particularly hurt by the loss of access to CD financing. This triggered fierce competition in the deposit market, with some banks aggressively focusing on deposit mobilization, especially by targeting large depositors (i.e., bulk deposits) to secure a more stable funding base. This increased their term deposit rates and, owing to competitive forces in the deposit market, other banks were compelled to raise their deposit rates.

4.3.6. Competition for Deposits and Clogging of Monetary Policy Transmission

After the IL&FS and DHFL defaults, banks faced increasing difficulty raising short-term funding from market borrowing. To secure access to stable funding bases, banks aimed at expanding their depositor base. Private banks took the lead by raising their term deposit rates (relative to prevailing market rates). Due to stiff competition from private banks, public banks were compelled to follow suit by raising their own deposit rates. Initially, the spread in term deposit rates between private and public banks widened, but it gradually narrowed again (Figure 29).

Overall, term deposit growth in private banks accelerated, reaching about 30 percent annual growth by March 2019. Over the fiscal year, private banks attracted almost 80 percent of new term deposits in the system. Meanwhile, growth in term deposits remained near zero for public banks, suggesting that their term deposit rate policy was targeted to ensure no shrinkage in their depositor bases. The public banks may be acting as price takers with respect to the term rates set by private banks and, in turn, responding to choose their own term deposit rates consistent with zero growth in their depositor bases.

As a result, the spread between term deposit rates and repo rates spiked significantly—both after the IL&FS default and further after the DHFL default (Figure 29). This led to clogging of the monetary policy transmission channel, with reduced pass-through from the policy repo rate to both deposit rates and lending rates. However, this is primarily due to uncertainty in banks’ access to liquidity.
The dynamics in the spread between deposit rates and repo rates over the past five years can be broken into five phases. First, before demonetization, the spread had stabilized at about 1 percent. Second, immediately after demonetization with surplus liquidity flowing into the banking system, the spread quickly declined to about 0.5 percent. Third, with the recognition of problems in public banks post-asset quality review and the announcement of a plan to recap them in the second half of 2017, term deposit rates diverged between public and private banks. Until June 2017, term deposit rates in public and private banks had tracked each other very closely, but over the next year, a gap of about 0.25 percent emerged between them, with public banks facing constraints in growing their balance sheet. Fourth, the IL&FS default in September 2018 changed the dynamics drastically, with the spread between term deposit rates and the repo rate of all banks spiking by roughly 1 percent within 7 months. Fifth, the spread of all banks spiked about a further 0.5 percent after the DHFL default in May 2019.

Thus, even though the RBI cut its policy rates by about 1.35 percentage points since the IL&FS default, key deposit and lending rates have not fallen by much, due to the ongoing and major liquidity crunch affecting the system. Therefore, owing to liquidity shortages and uncertainty, the effectiveness of monetary policy has declined on a per-unit basis—as each basis point cut in policy rates has had less impact on the key borrowing-lending rates faced by borrowers and lenders.

**Figure 29. Gap in Term Deposit Rates vs Repo Rate**

![Graph showing the gap in weighted-average term deposit rate vs. repo rate over time, with key events such as demonetization, public banks recap announcement, IL&FS default, and DHFL default marked.](source: RBI, Author’s calculations.)
4.3.7. Liquidity Hoarding and Lending Collapse

The IL&FS default and the DHFL-triggered scrutiny of bank balance sheets caused significant liquidity hoarding by banks. These factors likely contributed to the collapse of commercial bank lending in 2019’s second half. The DHFL default highlighted contagion risks in the banking system.

We can assess the impact on banks’ liquidity hoarding by looking at the funds parked in RBI’s liquidity adjustment facility (LAF) in Figure 30. The LAF is RBI’s main tool for injecting and absorbing liquidity through repo or reverse repo transactions.

Post-demonetization in November 2016, the RBI absorbed substantial excess liquidity. Banks then deployed this liquidity to the private sector and NBFCs/HFCs by 2017’s end. While the IL&FS shock temporarily increased liquidity hoarding, it didn’t cause persistent hoarding.

In contrast, the DHFL default triggered a significant shift in banks’ liquidity strategies. By 2019’s end, banks parked excess liquidity of about Rs 3 trillion (2% of their assets) in the LAF, reaching Rs 4 trillion in January 2020’s first week. Notably, this excess liquidity equaled 40 percent of banks’ fresh lending in FY2018-19, greatly impacting the economy.

The RBI financial stability report (RBI 2019a) suggested some banks were hoarding liquidity due to precautionary motives against potential drawdown
from large credit lines to nonbank financial intermediaries (Ivashina and Scharfstein 2010).

Overall, investor behavior in markets reflected flight-to-safety dynamics and high uncertainty. Access to liquidity remained uncertain. During such times, precautionary saving is common, and evidence pointed to significant liquidity hoarding in the banking system.

The next section discusses the broader economic impact of these developments.

4.4. Broader Economy-Wide Impact

4.4.1. A Large Deficit in the Flow of Credit to the Real Economy

Determining the right amount of credit for an economy is tough. Ideally, we’d quantify the credit justified by economic fundamentals. The gap between actual credit and this amount would indicate excessive or deficit credit. However, understanding credit demand and supply factors in an economy often requires some judgment. Researchers and authorities use a statistical approach to estimate the credit gap, avoiding some complexities (see (Lang and Welz 2017) for details).

A common statistical measure is the credit-to-GDP gap, which compares the total credit-to-GDP ratio to its long-term trend. The RBI uses this gap for its countercyclical capital buffer requirements under Basel III.37

The BIS has estimated the credit-to-GDP gap since September 2016 for 44 countries, including India (Figure 31). Since 2014, India has seen a growing credit deficit, reaching about -8 percent of GDP in 2019. This negative gap suggests a severe constraint on credit flow to the real economy, highlighting the importance of financial factors in India’s economic slowdown.

A key question is why the IL&FS shock led to reduced credit supply. The next subsection addresses this.

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37. The countercyclical capital buffer (CCyB) is an additional capital layer of typically up to 2.5 percent of risk-weighted assets under the Basel III framework, which can be released so that banks may absorb growing losses during a prolonged downturn while maintaining the flow of credit to the economy. Many jurisdictions that have implemented the countercyclical capital buffer under the Basel III framework use the Basel gap as one input (but not necessarily the only input) in guiding the operation of the countercyclical capital buffer. In India, the RBI’s countercyclical capital buffer framework envisages the credit-to-GDP gap as the main indicator, which is used in conjunction with other supplementary indicators, such as the credit-deposit ratio for a moving period of three years (given its correlation with the credit-to-GDP gap and GNPA growth), industrial outlook assessment index (due to its correlation with GNPA growth), and interest coverage ratio (due to its correlation with the credit-to-GDP gap) (based on RBI 2015). In April 2018, based on the review and empirical testing of countercyclical capital buffer indicators, the RBI decided that it is not necessary to activate countercyclical capital buffer at that point in time (RBI 2018).
**FIGURE 31. Credit-to-GDP Gap**

Credit-to-GDP Gap
(Percent of GDP)

Source: BIS.

**FIGURE 32. Demand versus Supply of Loans from NBFCs**

Source: TransUnion CIBIL.
4.4.2. Demand versus Supply of Credit

The decline in non-banking financial companies’ (NBFCs) lending in 2018 and 2019 raises a crucial question: Was the reduced credit flow to the economy a result of inadequate financial system supply or insufficient demand from eligible borrowers? Disentangling general equilibrium effects in the credit market is a formidable challenge, but examining whether healthy borrowers who merit credit were being denied access can provide insights.

Loan-by-loan data from credit-reporting agency TransUnion CIBIL can illuminate this issue. Specifically, they gather information on loan inquiries (when borrowers formally initiate loan requests at financial institutions) and loan sanctions (if institutions ultimately approve these inquiries). Figure 32 presents data exclusive to NBFCs.

The micro-data indicates that loan demand had steadily risen even after IL&FS’s collapse, increasing from approximately 190,000 inquiries in the first half of 2018 to about 230,000 in the first half of 2019 (a 22% growth). Conversely, loan sanctions dropped from over 180,000 to just below 170,000 (an 8% contraction) during the same period. Consequently, NBFCs’ loan approval rate plummeted within a year, from about 95 percent to 70 percent.

Despite robust credit demand, NBFCs significantly curtailed their credit supply, resulting in a sharp decline in loan approvals. This is likely attributable to the precautionary savings and adverse selection dynamics that emerged in the NBFC sector following the IL&FS default.

Faced with tighter funding conditions and increased scrutiny of their fundamentals, NBFCs may have felt compelled to: (1) reduce new credit volume and (2) tighten lending standards to fortify their loan books and limit the rise of non-performing assets. These combined effects could account for the post-IL&FS slump in fresh lending from NBFCs—highlighting the primary role of shrinking credit supply.

4.4.3. Severe Impact on Micro, Small, and Medium-Sized Enterprises

Micro, small, and medium enterprises (MSMEs) form a cornerstone of India’s economy, contributing almost 30 percent of GDP. The Development Commissioner for MSMEs reports they employ around 111 million people and account for nearly half of total exports. Following the disruptions from GST implementation and demonetization, and with multiple public banks leaving the PCA framework, lending to the MSME sector was expected to surge in 2018 and 2019. However, the sector suffered a severe credit crunch.

Lending to MSMEs plummeted after the IL&FS default in September 2018 and further after the DHFL default in June 2019. To observe this, one must analyze lending data to MSMEs across various sectors (private banks, public banks, NBFCs, others), which TransUnion CIBIL data enables (Figure 33). Prior to the IL&FS default, both NBFCs and private banks rapidly expanded...
**Figure 33.** Composition of Credit Growth to MSME Sector (Percentage Points)

Source: TransUnion CIBIL, Author’s estimations.

**Figure 34.** Non-Performing Assets (Percent of Total Credit)

Source: TransUnion CIBIL. Based on balance sheet data. Exposures > 100 Crore classified as 'Large'
MSME lending, partly filling the void left by public banks restricted by the prompt corrective action framework. By September 2018, private banks and NBFCs more than compensated for the reduced credit flow from public banks. However, MSME credit growth sharply decelerated following the IL&FS default. The initial slowdown was due to decreased credit growth from NBFCs, while the second phase—post-DHFL default—involves deceleration from all financial institutions, including private banks.

Furthermore, restricted funding access caused MSME liquidity issues to escalate into insolvency problems. TransUnion CIBIL’s on-balance sheet credit exposure data (Figure 34) reveals that MSME defaults soared from about 8.5 percent to around 12 percent within two quarters in 2019 after the IL&FS collapse. In contrast, large firms—those with credit exposure exceeding INR 100 crore (approximately $14 million)—did not experience a significant NPA increase post-IL&FS collapse. This is partly because the insolvency process was clearing the historical backlog of large-firm NPAs, counterbalancing the rise in new NPAs among large firms. This differs starkly from the post-asset quality review in 2015, when large firms were the primary NPA drivers.

The MSME sector’s credit contraction was a serious concern. The rise in liquidity hoarding in 2019 indicated ongoing credit flow constraints. Moreover, the decline in average risk weights of bank assets suggested that lenders were shifting their loan book composition from unrated or lower-rated corporates towards top-rated corporates and the retail sector. Consequently, both the credit volume decline and credit composition shift intensified the MSME credit crunch. This likely had a significant impact on the broader economy, considering the sector’s importance.

4.4.4. Second-Round Effects as Illiquidity Turns Into Insolvency

With limited working capital and an increasing number of stalled projects, immediately prior to the pandemic, the concern was that liquidity issues had escalated into insolvency problems for otherwise healthy MSMEs and corporates. As payments were delayed and projects remained on hold, the impact spread through the supply chain, affecting various sectors. These were the second-round effects of the initial shocks to the NBFC sectors.

One way to assess the severity of these second-round effects is by examining the migration in corporate ratings. CRISIL, a credit rating agency, calculates a debt-weighted ratio representing the value of debt upgraded relative to the value of debt downgraded. A ratio below one signifies more value-weighted downgrades compared to upgrades. Figure 35 displays the 12-month moving average of the ratio. Before the IL&FS crisis, the corporate credit outlook was

---

38. Notably, various attempts to revive lending to the MSME sector were not effective, including a “loan mela” (fair) across 250 districts during the festive season in October 2019, in which public banks were called in to lend to MSMEs and retail borrowers.
improving, with the ratio exceeding 2. However, the trend reversed sharply after the IL&FS default, dropping to around 0.25 by March 2020, indicating four times as many value-weighted downgrades compared to upgrades.

This shift may have reflected both a deteriorating credit outlook and increased vigilance from credit rating agencies after the IL&FS default caught them off guard. On December 26, 2019, the Securities and Exchange Board of India fined two leading rating agencies for failing to exercise proper skill, care, and due diligence in assigning credit ratings for IL&FS debt. Some agencies maintained the highest possible AAA rating for IL&FS until its default, even though its subsidiary had defaulted a few months earlier.

Additionally, potential laxity and oversight lapses by credit rating agencies contributed to market uncertainty, as investors questioned the health of banks, NBFCs, and corporates, despite their high credit ratings. As a result, dispersion had increased for credit spreads of debt instruments issued by equally rated financial institutions.

**FIGURE 35. Value of Debt Updated versus Downgraded**

*Source: CRISIL.*
*Note: From CRISIL. A value less than 1 signifies more value-weighted downgrades than upgrades.*

Other factors driving uncertainty and worsening credit outlook at that time included ongoing issues in some cooperative banks (with deposit restrictions introduced in at least two urban cooperatives), concerns about rising defaults
in social-scheme loans (such as Mudra loans), and increased risks in retail loan segments, which had grown significantly in previous quarters.

4.4.5. GDP Impact

In this section, we examine the synchronized deceleration in sectoral credit flow and GDP growth, providing another perspective on the influence of financial factors on India’s growth deceleration. Figure 36 illustrates the sector-wise contributions to real GDP growth.

**FIGURE 36. Contraction in Manufacturing and Construction during 2019 and 2020**

A comparison of sectoral growth in 2018, just prior to the IL&FS shock, with subsequent performance offers some insights. Real GDP growth took a steep fall from 8.9 percent in Q4 FY2017-18 to a mere 2.9 percent in Q4 FY2019-20. Simultaneously, contributions to GDP growth from the manufacturing and construction sectors sharply declined from 3.2 percent to -0.7 percent. These sectors thus significantly contributed to the pre-pandemic GDP deceleration, partially offset by a robust agricultural recovery.

The analysis implies that financial factors likely catalyzed the economic slowdown, with credit-sensitive sectors like manufacturing and construction enduring the most severe disruptions to economic activity.
5. Part IV: Policy Actions and Resilience Building

This section discusses the policy responses before the pandemic (2018 and 2019), events in the financial system during the acute phase of the pandemic (2020 to 2022), and the increased resilience in the Indian financial system that enabled them to avoid the problems facing western banks in the first half of 2023.

5.1. Policy Response Before the Pandemic (2018 and 2019)

The policy response before the pandemic can be categorized under liquidity operations, monetary policy, financial policy, and fiscal policy. These are discussed below, and Table 2 provide a list of key events and policy responses in chronological order.

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
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<tbody>
<tr>
<td>14-Feb-18</td>
<td>Punjab National Bank (PNB) reports fraudulent and unauthorized transactions in its branches amounting to $1.77 billion</td>
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<td>16-Feb-18</td>
<td>RBI’s issued statement on PNB, notifying that it has undertaken a supervisory assessment of control system in PNB</td>
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<tr>
<td>20-Feb-18</td>
<td>RBI constitutes an Expert Committee to assess misclassification and frauds in banks, and measures needed to prevent it</td>
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<tr>
<td>15-Mar-18</td>
<td>Government-owned NBFCs advised by RBI to submit periodic returns</td>
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<td>Jun 2018</td>
<td>IL&amp;FS group’s subsidiary delays repayments of inter-corporate deposits and unable to service some debt obligations</td>
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<td>4-Sep-18</td>
<td>IL&amp;FS group and its subsidiary defaults on short-term bank loans of Rs 1,000 crore and Rs 500 crore respectively</td>
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<td>Sep 18</td>
<td>IL&amp;FS group and subsidiaries default on a series of payments</td>
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<td>21-Sep-18</td>
<td>Commercial paper and mutual funds affected by fears of widespread default by IL&amp;FS; Stock market crashes</td>
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<tr>
<td>23-Sep-18</td>
<td>Joint statement by the RBI and SEBI stating that they are closely monitoring situation and are ready to take action, if necessary</td>
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<td>Date</td>
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<td>2018 Q4</td>
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<td>1-Oct-18</td>
<td>GoI petitions NCLT against IL&amp;FS Board; appoints independent Board for orderly IL&amp;FS resolution.</td>
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<td>4-Oct-18</td>
<td>New Board takes charge of IL&amp;FS group with aim of achieving orderly and transparent resolution of the group</td>
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<td>2-Nov-18</td>
<td>To ease funding problems of NBFCs, RBI permits bank to provide partial credit enhancement to bonds issued by NBFCs</td>
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<tr>
<td>29-Nov-18</td>
<td>To improve systemic liquidity, RBI informs banks regarding the applicability of NSFR with effect from April 1, 2020</td>
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<td>2019 Q1</td>
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<tr>
<td>1-Jan-19</td>
<td>RBI allows a one-time restructuring of existing loans to MSMEs to relief funding stress in the sector</td>
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<td>22-Feb-19</td>
<td>To improve flow of credit to well-rated NBFCs risk weights of bank exposure to NBFCs were harmonized by the RBI</td>
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<tr>
<td>Early-Feb 19</td>
<td>Rating agencies downgrade DHFL instruments; CEO resigns</td>
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<td>2019 Q2</td>
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<tr>
<td>16-May-19</td>
<td>NBFCs with asset size of more than Rs 50 billion were advised to appoint a chief risk officer (CRO) by the RBI</td>
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<td>6-Jun-19</td>
<td>RBI introduces a minimum leverage ratio of 4 percent for systemic banks, and 3.5 percent for other banks, effective Oct 1, 2019</td>
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<td>4-Jun-19</td>
<td>DHFL delays interest payments; Net asset values (NAV) of several mutual/debt funds exposed to DHFL impacted</td>
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<tr>
<td>7-Jun-19</td>
<td>RBI releases Prudential Framework for Resolution of Stressed Assets</td>
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<td>10-Jun-19</td>
<td>Urban cooperative banks (UCBs) having liquidity stress permitted to sell securities from Held-to-Maturity (HTM) portfolio</td>
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<td>2019 Q3</td>
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<tr>
<td>Jul-Aug 19</td>
<td>DHFL defaults on a series of payments; enters talks with creditors and bondholders to restructure its debt</td>
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<tr>
<td>15-Jul-19</td>
<td>DHFL reports huge loss in regulatory filing and reveals defaults; Share price plunges on fear of DHFL collapse</td>
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<tr>
<td>5-Jul-19</td>
<td>The Union Budget announces recap of public sector banks by Rs 0.7 trillion; RBI given further authority to regulate NBFCs</td>
</tr>
<tr>
<td>5-Jul-19</td>
<td>To ease liquidity, the GoI introduced a partial credit guarantee to PSBs for purchase of high-rated pooled assets from NBFCs</td>
</tr>
<tr>
<td>5-Jul-19</td>
<td>RBI announces additional liquidity facility to banks for purchase of assets from and/or onlending to NBFCs/HFCs</td>
</tr>
<tr>
<td>30-Jul-19</td>
<td>To ease funding, RBI relaxes end-use stipulations under External Commercial Borrowings Framework for Corporates and NBFCs</td>
</tr>
<tr>
<td>Sep-19</td>
<td>DHFL resolution stalled with creditors and bondholders unable to reach agreement</td>
</tr>
<tr>
<td>13-Aug-19</td>
<td>Transfer of regulation of Housing Finance Companies (HFCs) to RBI; HFCs henceforth treated as a category of NBFCs</td>
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<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
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<tbody>
<tr>
<td>13-Aug-19</td>
<td>To boost credit for borrowers reliant on NBFCs, RBI classifies bank on-lending to NBFCs as priority sector lending</td>
</tr>
<tr>
<td>Mid Sep 19</td>
<td>Hidden exposures of Punjab &amp; Maharashtra Cooperative (PMC) Bank revealed; Few large depositors begin withdrawals</td>
</tr>
<tr>
<td>24-Sep-19</td>
<td>RBI placed the PMC Bank under Directions to protect funds; Deposit withdrawal limit of Rs 1,000 introduced</td>
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**2019 Q4**

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
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<tbody>
<tr>
<td>1-Oct-19</td>
<td>To improve transmission of policy rates to lending rates, RBI requires banks to link floating rate loans to external benchmark</td>
</tr>
<tr>
<td>Early Oct 19</td>
<td>RBI enhances withdrawal limit for depositors of PMC Bank to Rs 25,000, and later to Rs 40,000</td>
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<tr>
<td>1-Nov-19</td>
<td>To absorb large liquidity surpluses in system, RBI announces longer term reverse repo auctions</td>
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<tr>
<td>1-Nov-19</td>
<td>RBI reorganises its regulation and supervision departments to having a holistic approach to supervision and regulation</td>
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<tr>
<td>4-Nov-19</td>
<td>RBI enhances the Liquidity Risk Management Framework for NBFCs to strenghten liquidity risk management in NBFCs</td>
</tr>
<tr>
<td>5-Nov-19</td>
<td>RBI enhances withdrawal limit for depositors of PMC Bank to Rs 50,000</td>
</tr>
<tr>
<td>6-Nov-19</td>
<td>Cabinet approves a Rs 25,000 crore fund to provide priority debt financing for completion of stalled housing projects</td>
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<tr>
<td>15-Nov-19</td>
<td>Govt introduces special interim framework for insolvency resolution of financial service providers under the IBC</td>
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<tr>
<td>20-Nov-19</td>
<td>RBI supersedes the Board of Directors of DHFL and appoints Administrator to expedite resolution under the IBC</td>
</tr>
<tr>
<td>29-Nov-19</td>
<td>DHFL becomes first financial company to be referred to the NCLT under IBC</td>
</tr>
<tr>
<td>19-Dec-19</td>
<td>To lower long-term yields, RBI announces special open market operation purchase and sale of GSecs (“Operation Twist”)</td>
</tr>
</tbody>
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Sources: RBI Press Releases, RBI Annual Reports, Union Budget, and other relevant materials.

Color Codes: PNB events; IL&FS; DHFL; PMC Bank; Actions by GoI/RBI.

### 5.1.1. Liquidity Operations

The RBI’s liquidity policy in India followed a conventional lender-of-last-resort approach, focusing on injecting aggregate liquidity into the system and encouraging banks to channel excess liquidity to the NBFC sector. Measures taken include significant open market purchases, sizable net purchases of foreign currency, and various initiatives to encourage banks to channel excess liquidity to the NBFC sector.

At the onset of the financial crisis in the United States, (Cecchetti 2007) highlighted the limitations of central banks in distributing funds to the areas that need them the most. Central banks can provide liquidity to primary dealers, but they cannot ensure that these reserves are then lent out to the banks that need them.
In India, the RBI’s liquidity policy followed the conventional lender-of-last-resort approach without expanding the scope of lender-of-last-resort operations (as described by Cecchetti 2007). Since the IL&FS default, the RBI’s liquidity operations can be classified under two broad approaches: (1) inject aggregate liquidity into the system, and (2) in turn encourage banks to channel the “excess” aggregate liquidity to the NBFC sector. Actions under these two approaches are discussed below.

**Injecting Aggregate Liquidity into the System**

The RBI uses the liquidity adjustment facility (LAF) to manage system liquidity in the banking system. If the banking system is a net borrower from the LAF, the RBI considers system liquidity to be in deficit (meaning system demand for borrowed reserves is positive). Conversely, if the banking system is a net lender to the RBI, the system liquidity is considered to be in surplus (meaning system demand for borrowed reserves is negative) (RBI 2019b).

Following the IL&FS shock, system liquidity turned negative in September 2018, indicating a deficit in the banking system. However, by June 2019, the RBI successfully managed to turn the system liquidity into a surplus. This was achieved through significant open market purchases initiated immediately after September 2018 and sizable net purchases of foreign currency from authorized dealers. These measures helped to gradually bring system liquidity into positive territory, alleviating the financial stress caused by the IL&FS crisis.

**Encouraging Banks to Channel Liquidity to the NBFC Sector**

The RBI and the Government of India implemented a series of measures to encourage banks to channel excess liquidity to the NBFC sector. These measures were:

- November 2, 2018: RBI allowed banks to provide partial credit enhancement to bonds issued by systemically important non-deposit taking NBFCs/HFCs.
- February 22, 2019: RBI reduced/harmonized risk weights of bank exposure to NBFCs, improving credit flow to well-rated NBFCs.
- July 5, 2019: Union Budget announced a partial credit guarantee for public sector banks to purchase high-rated pooled assets worth Rs 1 lakh crore from NBFCs.
- July 30, 2019: RBI liberalized the external commercial borrowings framework, enabling NBFCs to raise funds for on-lending and repayment of rupee loans.
- August 13, 2019: RBI allowed bank lending to NBFCs for on-lending to agriculture, micro and small enterprises, and housing to be classified as priority sector lending, up to specified limits.
Additionally, on August 18, 2019, the Ministry of Economic Affairs removed the redemption reserve requirement for debenture issuance by NBFCs/HFCs, reducing their cost of capital. These measures aimed to provide financial support to the NBFC sector and alleviate the challenges faced during the IL&FS crisis.

5.1.2. Monetary Policy Actions

The RBI implemented three broad monetary policy actions in response to the slowdown: interest rate cuts, measures to improve policy rate transmission, and the operation twist.

1. **Interest Rate Cuts**: The RBI began cutting rates in February 2019, reducing the policy repo rate by 135 bps (Figure 37). However, in December 2019, they paused the cuts due to rising food price inflation and reduced policy rate transmission, keeping the repo rate at 5.15 percent while maintaining an accommodative stance.

2. **Measures to Improve the Transmission of Policy Rates**: In September 2019, the RBI mandated that banks link all new floating rate loans to MSMEs and retail loans (for buying homes, vehicles, and personal consumption) to an external interest rate benchmark from October 1, 2019. This aimed to improve policy rate transmission to lending rates, which had weakened since the end of 2018.

3. **Operation Twist**: In December 2019, the RBI introduced operation twist transactions, involving simultaneous purchases of long-maturity G-Secs and sales of short-maturity G-Secs. This aimed to reduce the slope of the yield curve and enhance policy rate transmission beyond short-term market rates. By mid-January 2020, the RBI had conducted three such transactions, each with a target transaction amount of Rs 10,000 crore.

5.1.3. Macroeconomic Policy

Six broad actions were taken to address the financial issues:

1. **Clean Up of NBFC Sector**: In 2018, over 10,000 NBFCs operate in India. To address the issues in the Non-Banking Financial Company (NBFC) sector, the Reserve Bank of India (RBI) withdrew the license of nearly 2,000 small NBFCs between 2018-19. This involved either canceling the Certificate of Registration of these NBFCs or having them surrender the certificates to the RBI (Figure 38).

2. **Regulatory Forbearance to the MSME Sector**: To provide relief to the Micro, Small, and Medium Enterprises (MSME) sector, the RBI, in January 2019, allowed a one-time restructuring of existing loans to
**FIGURE 37. Central Bank Policy Rate**

RBI Policy Rate: Repo Rate (Percent)

Source: RBI.

**FIGURE 38. Number of NBFC Licenses Withdrawn**

Number of NBFC Licenses Withdrawn per Month (Cancelation of Surrender of Certificates of Deposits by the RBI)

Source: RBI, Author’s calculations.
MSMEs with exposures up to Rs 25 crore as of January 1, 2019. Under this scheme, restructured loans would not lead to an asset classification downgrade, which typically requires banks to set aside 15 percent of the outstanding amount as provisions. Instead, lenders were required to set aside 5 percent of the outstanding loan amount as additional provisions while continuing to classify the loan as standard (performing).

3. **Strengthening Regulation/Supervision:** The RBI took steps to strengthen regulation and supervision. On June 7, 2019, it revised the prudential framework for the resolution of stressed assets, aligning provisioning norms between banks and NBFCs and giving lenders 30 days to review a borrower’s account before labeling it as a Non-Performing Asset (NPA) in case of default. The revised framework replaced the previous circular, which required lenders to start resolution even if there was a default of one day. On August 13, 2019, the regulation of Housing Finance Companies (HFCs) was transferred to the RBI by the Government of India, and HFCs were treated as a category of NBFCs, harmonizing regulation in the shadow banking sector. On November 1, 2019, the RBI announced the reorganization of its regulation and supervision departments to have a holistic approach to supervision and regulation.

4. **Expanding the Insolvency Process:** On November 15, 2019, the Government of India introduced a special interim framework for insolvency resolution of financial service providers under the Insolvency and Bankruptcy Code, laying the path for expedited resolution of Dewan Housing Finance Corporation Limited (DHFL). This new framework aimed to improve the insolvency resolution process for financial service providers, ensuring more efficient outcomes.

5. **Mergers of Public Banks:** On August 30, 2019, the Ministry of Finance announced mergers that would consolidate 10 public banks into 4 entities. This plan aimed to create larger, more efficient banks that can better serve the credit needs of the Indian economy:
   a. Oriental Bank of Commerce and United Bank of India would be merged into Punjab National Bank, creating India’s second-largest public bank.
   b. Canara Bank and Syndicate Bank would be merged, forming the fourth-largest public bank.
   c. Union Bank of India, Andhra Bank, and Corporation Bank would be merged, resulting in the fifth-largest public bank.
   d. Indian Bank and Allahabad Bank would be merged, creating India’s seventh-largest public bank.

6. **Expanded Support from All-India Financial Institutions:** All-India Financial Institutions (AIFIs) are government-guided development finance institutions that play a crucial role in the Indian economy. They assist in allocating resources between savers and borrowers and provide
various oversight functions. The four main AIFIs are: (a) EXIM Bank - which focuses on promoting cross-border trade and investment, (b) NABARD - which focuses on the agriculture sector, (c) SIDBI - which focuses on MSMEs, and (d) National Housing Board - which focuses on promoting housing finance. As of March 2019, AIFIs’ combined balance sheet stood at Rs 8.3 trillion (or about 4% of GDP). Over FY2018-19, their balance sheets expanded significantly, growing 19 percent year on year. Beyond their core functions, AIFIs have been involved in different schemes to support the struggling MSME and NBFC/HFC sectors. In particular:

a. On November 2, 2018, the Government of India announced an interest subvention scheme for MSMEs. This scheme provided a 2 percent interest subvention for all GST-registered MSMEs on fresh lending or incremental loans. SIDBI was designated as the nodal agency to channel the interest subvention to various lending institutions.

b. On August 13, 2019, the Ministry of Finance announced liquidity support of Rs 0.2 trillion to HFCs from the National Housing Board. This move aimed to address liquidity concerns in the housing finance sector, which had been negatively impacted by the IL&FS crisis and the subsequent credit crunch in the NBFC sector.

5.1.4. Fiscal Policy

Several targeted fiscal measures were taken.

On July 5, 2019, the Ministry of Finance announced additional tax deductions of up to Rs 1.5 lakh for interest paid on affordable housing loans. This move aimed to encourage home buyers and support the housing sector by making housing loans more attractive.

On November 6, 2019, the cabinet approved the establishment of an Alternative Investment Fund (AIF) worth Rs 0.25 trillion (Rs 25,000 crore) to provide relief to developers with unfinished real estate projects and ensure the delivery of homes to buyers. The fund’s primary purpose was to provide priority debt financing for the completion of stalled affordable housing projects, addressing the challenges faced by developers and homebuyers due to delays in project completion.

On December 31, 2019, the Ministry of Finance unveiled a national infrastructure plan worth Rs 1 trillion to be implemented over the next five years. A key aim of the plan was to front-load some of the already-identified investment projects, accelerating infrastructure development and boosting economic growth. The ambitious plan targeted various sectors, including energy, transportation, agriculture, and urban infrastructure, aiming to enhance overall connectivity and development across the country.
5.2. Policy Response During the Pandemic (2020-22)

The COVID-19 pandemic significantly disrupted the macro-financial dynamics set in motion by the defaults of IL&FS and DHFL. While the pandemic brought with it major disruptions, including strict lockdowns initially that halted the economy, the Reserve Bank of India (RBI) and the government stepped in with unprecedented liquidity support and fiscal measures (RBI 2023).

This section provides a brief overview of the key developments during COVID-19 and their consequences before we turn to the challenges ahead in the following section.

5.2.1. Key Developments during the Pandemic

The COVID-19 pandemic has significantly impacted the Indian financial system, leading the authorities to implement various measures to mitigate its effects. These measures, presented in chronological order, include:

1. **YES Bank Crisis Resolution (March 2020):** In response to YES Bank’s crisis due to a sharp increase in bad loans, the RBI intervened on March 13, 2020. The central bank approved a reconstruction plan involving an equity infusion from a consortium of eight banks and financial institutions led by the State Bank of India. As a result, a total of Rs 10,000 crore was infused into the bank, and the moratorium was lifted on March 18, 2020. The crisis highlighted the need for better governance and risk management in India’s banking sector.

2. **Loan Repayment Moratorium (March 2020 – August 2020):** The RBI initially announced a three-month moratorium on loan repayments in March 2020, which was extended to six months in August 2020. This relief measure provided borrowers facing financial difficulties due to the pandemic with additional time to repay their loans, easing their financial burden during this challenging period.

3. **Interest Rate Reduction (March – May 2020):** The RBI implemented a series of interest rate reductions to stimulate economic growth and encourage banks to lend more. Between March and May 2020, the central bank reduced the repo rate by 115 basis points, ultimately bringing it down to 4 percent. The reverse repo rate was also reduced by 155 basis points, from 4.90 percent to 3.35 percent. The reverse repo rate is the rate at which banks lend money to the RBI, and the reduction in the rate made it less attractive for banks to park their excess funds with the central bank and incentivized them to lend more to borrowers.

4. **Enhanced Liquidity Support to Banks & Nonbanks (April – July 2020):** The RBI launched various measures to ensure banks and nonbanks had sufficient liquidity to meet the economy’s credit needs.
a. **TLTRO:** In March 2020, the RBI introduced Targeted Long-Term Repo Operations (TLTRO) to inject liquidity into the financial system and ensure credit flow to specific sectors, particularly NBFCs and MSMEs. Under TLTRO, the RBI conducted auctions of targeted term repos for up to Rs 1 trillion. Through this window, banks could access three-year funding from the RBI at a floating rate linked to the policy repo rate to invest in investment-grade securities. (Later in October 2020 this scheme evolved into the “On Tap TLTRO” and in February 2021 the RBI allowed banks to provide funds to NBFCs under the On Tap TLTRO Scheme).

b. **TLTRO 2.0:** In April 2020, the RBI launched TLTRO 2.0, providing an additional Rs 0.5 trillion specifically for NBFCs, microfinance institutions (MFIs), and smaller financial institutions. Banks had utilized the TLTRO 1.0 funds for investing in high-rate corporate securities. This left out the small- and mid-sized NBFCs and MFIs, which were facing liquidity challenges. Under the TLTRO 2.0 window, banks could access three-year funding from the RBI to invest in investment-grade securities of NBFCs, with at least 50 percent invested in smaller NBFCs and MFIs.

c. **SLF-MF:** In April 2020, the RBI also introduced a special liquidity facility for mutual funds (SLF-MF) of up to Rs 0.5 trillion, which lasted until May 2020. This facility aimed to ease liquidity pressures on mutual funds during the pandemic.

d. **SAF:** In July 2020, the government launched a Special Liquidity Scheme worth Rs 0.3 trillion to help Non-Banking Financial Companies (NBFCs) and Housing Finance Companies (HFCs) overcome their liquidity problems. Under this scheme, a Special Purpose Vehicle (SPV) managed by the State Bank of India (a government-owned bank) bought short-term debt from NBFCs/HFCs using funds from a Stressed Asset Fund (SAF). The SAF issued special securities backed by the Government of India and sold to the RBI only. The Department of Financial Services at the Ministry of Finance oversaw the scheme. This scheme was different from the Partial Credit Guarantee Scheme, which required multiple deals between public sector banks and NBFCs, forced NBFCs to sell their current assets, and used funds from public sector banks. Instead, this scheme offered a single platform for the SPV and the NBFCs without affecting their current assets. The scheme also enabled the NBFCs to get better ratings for their bonds.

5. **Emergency Credit Line Guarantee Scheme (ECLGS) (May 2020):** The government introduced the ECLGS in May 2020 to provide collateral-free loans to micro, small, and medium enterprises (MSMEs) and other eligible businesses impacted by the pandemic. Offering a 100 percent
government guarantee on loans, the scheme incentivized banks to lend to businesses during the crisis.

6. RBI’s Restructuring Framework for Stressed Assets (August 2020): In August 2020, the RBI introduced a one-time restructuring framework for stressed assets. This measure allowed banks and financial institutions to restructure loans for borrowers affected by the pandemic, preventing a surge in non-performing assets (NPAs) in the banking system and providing borrowers with relief.

7. Lakshmi Vilas Bank Failure (November 2020 – December 2020): In November 2020, the RBI placed Lakshmi Vilas Bank (a private bank) under moratorium due to its weak financial position, capping deposit withdrawals at Rs 25,000. The bank was later merged with DBS Bank India on November 27, 2020. This move aimed to protect the interests of depositors and maintain financial stability.39

8. Suspension & Reactivation of the IBC (2020-2021): India’s Insolvency and Bankruptcy Code (IBC), which came into force in 2016, aims to resolve the cases of distressed debtors in a time-bound and creditor-driven manner. The framework has been hailed as a landmark reform that aims to facilitate the recovery of billions of dollars of bad loans. However, the framework has also faced some challenges, such as delays, litigation, lack of capacity, operational glitches and regulatory uncertainty. The COVID-19 pandemic added to the woes of the framework, as it forced the government to suspend it for nine months to protect the businesses from insolvency. The suspension was lifted in March 2021, and also introduced a new pre-packaged process for small and medium enterprises (Pre-Packaged Insolvency Resolution Process or PIRP), which allows them to negotiate a resolution plan with their creditors before approaching the tribunal. The government plans to extend this process to larger firms as well.

9. Creation of a Bad Bank (February 2021): In February 2021, the National Asset Reconstruction Company Limited (NARCL) was announced, which is 51 percent owned by public banks. It was established as a ‘bad bank’ to help dispose of the stressed assets of commercial banks. The NARCL would purchase NPAs with 15 percent of the sum paid in cash and 85 percent in tradable securities. The government will guarantee Rs 306 billion against these securities, valid for 5 years.

10. Bank Privatization (August 2021): In August 2021, the government announced plans to privatize two public sector banks. This initiative aimed to improve the banking sector’s efficiency and reduce the government’s

39. Prior to this, on April 5, 2019, the board of Lakshmi Vilas Bank approved a merger with the country’s second-largest housing finance company, Indiabulls Housing Finance. However, the plan was discarded after the RBI refused to give approval.
financial burden. In the Union Budget 2021-22, the government identified two public sector banks for privatization and initiated the process of selling its stake in IDBI Bank to strategic investors.

11. Addressing Regulatory Arbitrage (October 2022): The Reserve Bank of India (RBI) introduced a scale-based regulatory framework for NBFCs. The regulatory structure for NBFCs comprises of four layers based on their size, activity, and perceived riskiness. The scale-based framework encompasses different facets of regulation of NBFCs covering capital requirements, governance standards, prudential regulation, and others. This framework aims to further reduce potential regulatory arbitrage between banks and NBFCs and became effective in October 2022.

12. PMC Bank Crisis Resolution (2019 – 2022): The Punjab and Maharashtra Co-operative (PMC) Bank crisis came to light in September 2019 when the RBI placed the bank under regulatory restrictions due to severe financial irregularities. Investigations revealed that PMC Bank had a significant exposure to the financially troubled Housing Development and Infrastructure Limited (HDIL) group, with over 70 percent of its loan book concentrated on this single borrower. The bank’s management had hidden this exposure by creating thousands of fictitious accounts to conceal non-performing assets. The crisis raised questions about the governance, risk management, and regulatory supervision of cooperative banks in India. In response, the RBI announced measures to strengthen the regulatory framework for urban cooperative banks (UCBs), including revised exposure norms, governance reforms, and increased reporting requirements. In June 2021, the RBI granted approval to an NBFC, to set up a small finance bank that would acquire the assets and liabilities of PMC Bank. This was completed in January 2022.

13. A New Development Bank (2021-2023): The National Bank for Financing Infrastructure and Development (NaBFID) was established by an Act of Parliament in 2021 with the primary objective of addressing gaps in long-term non-recourse finance for infrastructure development in India. The DFI has a dual focus on both developmental and financial objectives and aims to boost the country’s economy by strengthening the development of bonds and derivatives markets. In December 2022, NaBFID disbursed its first loan of Rs 520 crore for a National Highway project, and its loan pipeline stands at Rs 50,000 crore (or about 2.5 percent of GDP). The bank is expected to disburse Rs 15,000 crore in the first quarter of 2023.

Overall, during the COVID-19 pandemic, various developments unfolded in the financial system. The RBI implemented a range of measures such as cutting interest rates, providing targeted liquidity support to specific sectors, and implementing loan moratoriums to help borrowers navigate the crisis. Meanwhile, the government introduced several fiscal packages to support businesses and individuals affected by the pandemic. The period also saw a
number of bank resolutions, regulatory changes, and the introduction of new government-guided institutions.

5.3. Financial Health Restored?

Reflecting on the past ten years, we can see a concerted policy effort to repair balance sheets, a process that unfolded in three significant stages. The journey began with the asset quality review in 2015, progressed with a comprehensive crisis response in 2018 and 2019, and culminated with the implementation of a pandemic playbook from 2020 to 2023. The critical question that emerges is: did these policies ultimately succeed in rejuvenating the health of the financial system?

**FIGURE 39. Rise and Fall of Non-performing Assets**

[Graph showing the rise and fall of non-performing assets]

As of mid-2023, the answer leans towards the affirmative. After years of diligent efforts, these policies eventually succeeded in reviving the financial system by enhancing asset quality and strengthening capital and liquidity positions (Figure 39). Still, it’s important to balance these gains against the cost of the economic activity that was sacrificed during the nearly decade-long credit crunch, even though quantifying this cost poses challenges. Moreover, it is important to recognize that some favorable external factors, such as the global interest rate decline prompted by the pandemic, also contributed to the mending of balance sheets.
The financial sector policies of the past decade have produced two significant positive outcomes. First, the policy response to the pandemic, implemented from 2020 to 2023, successfully staved off a financial meltdown. This was achieved through a blend of accommodative monetary policy, emergency liquidity, guarantees, fiscal measures, and regulatory easing. Authorities deserve credit for a broad range of initiatives such as loan repayment moratoria, credit guarantee schemes for MSMEs, and emergency liquidity measures, which fortified the financial sector and facilitated its repair.

Second, a decade of active repair, coupled with a shift towards prudent lending policies after the Indian Financial Crisis of 2018-20 and accommodative policies during the pandemic, steered numerous banks and non-banks back to profitability and stronger balance sheets. This happened due to at least five factors:

1. **Corporate Deleveraging:** Envision a corporation as a mountaineer, burdened by a heavy backpack of debt, striving to reach the peak of financial success. What if this mountaineer could shed some weight, making the ascent less strenuous and more efficient? Since 2018, Indian corporations have been systematically unburdening themselves of debt, a process known as deleveraging. This shedding of debt has been propelled by a confluence of factors. Some firms have liquidated assets, channeling the proceeds towards debt repayment. Others have prioritized settling existing loans over acquiring new ones. In certain instances, insolvency resolutions under the NCLT processes have facilitated debt reduction. This deleveraging trend was already underway pre-pandemic, but the health crisis accelerated the process.

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40. Over the past few years, Indian banks have cut down their bad loans and increased their capital, making them more robust against economic stress. The rate of bad loans in relation to total loans for Indian banks has been decreasing since it hit 10.8 percent in September 2018. This ratio dropped from 7.3 percent in March 2021 to 5.8 percent in March 2022 and further to 4.4 percent by the end of 2022. Also, banks have been setting aside more money for bad loans, reaching 71.5 percent coverage by September of that year. The health of banks, measured by their Capital to Risk Weighted Assets Ratio (CRAR) and Common Equity Tier 1 (CET1) ratio, stood at around 16 percent and 13 percent by the end of 2022. These figures are above the minimum regulatory requirements of 9 percent and 5.5 percent, respectively. In comparison to their U.S. counterparts, Indian banks have less risk associated with changes in interest rates. The NBFC sector also showed a strong recovery after the pandemic, with the quality of assets continually improving. The rate of bad loans in this sector (excluding core investment companies) dropped from 6.9 percent in June 2021 to 5.1 percent by September 2022. Although some stress remains in specific NBFC groups, the sector’s capital position stayed robust, with a CRAR of 27.4 percent as of end-September 2022. New regulations starting from October 1, 2022, require all NBFCs to collect the full overdue amount to upgrade a bad loan. The classification of bad loans will now start from the exact overdue date, unlike the previous practice of starting 90 days from the end of the month in which the loan became overdue. These regulatory changes may affect the sector’s near-term assessment of asset quality.
2. **Pandemic Policies & Lower Interest Rates:** During the pandemic, the RBI implemented several policy measures that had a positive impact. These measures included reducing interest rates, providing liquidity support, implementing regulatory forbearance, and granting a moratorium on loan repayments. These actions effectively alleviated liquidity pressures, lowered borrowing costs, and offered relief to borrowers in distress. These policies also helped deleveraging efforts. The reduction in interest rates by the RBI contributed to a decrease in borrowing costs for both businesses and consumers, making it easier to manage debt payments. Additionally, the decrease in the reverse repo rate encouraged banks to allocate more funds to productive sectors of the economy, ultimately enhancing the flow of credit.

3. **Limited Fresh Lending & Decline of Bad Debts:** Banks witnessed a decrease in their non-performing asset (NPA) ratio and an increase in their capital ratio. Meanwhile, listed firms demonstrated a decline in leverage, and delinquency rates decreased across various sectors and borrower types. These advancements can be attributed to the recovery of the corporate sector, as mentioned earlier, with financial institutions prioritizing balance sheet repair over fresh lending. Additionally, efforts to address existing bad debts gradually, without accumulating significant new ones, have contributed to this positive trend. Furthermore, the unexpected surge in metal and commodity prices following the Russian invasion of Ukraine inadvertently provided support to certain infrastructure, metal, and energy sector corporates, who were sizable contributors to the bad debts problem.

4. **Temporary Shift Away from Infrastructure Financing:** In recent years, there has been a noticeable shift in infrastructure financing, with the government assuming a more prominent role. This change has allowed banks and nonbank financial institutions to reduce their exposure to the sector. The establishment of NaBFID in 2021 exemplifies the government’s increasing involvement in infrastructure financing and its recognition of the need for specialized financial institutions to support infrastructure development. This initiative signifies a return to the Development Finance Institution (DFI) model, which was previously abandoned in the early 2000s. NaBFID’s primary objective is to provide long-term financing for infrastructure projects in India, aiming to foster economic growth and development. Additionally, the creation of NARCL in 2021, a ‘bad bank’ with a majority stake held by public banks, demonstrates the government’s willingness to use the public balance sheet more freely to address losses arising from failed past project lending.41

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41. For instance, in 2023, NARCL acquired its first stressed asset, a loan extended by IDBI and other lenders to an infrastructure development company, Jaypee Infratech.
5. **STRENGTHENED SUPERVISION:** The RBI’s new supervisory approach integrates the supervisory processes for commercial banks, NBFCs, and urban cooperative banks. The RBI now focuses more on risk, supervises continuously, and strengthens both on-site and off-site surveillance. New regulatory frameworks for NBFCs and cooperative banks, issued in October 2021 and July 2022 respectively, have also been implemented to improve governance and risk management.

While the Indian financial sector has made significant strides, it continues to navigate a turbulent global environment and some domestic headwinds in 2023. With global inflation driving interest rates up and pandemic-related support coming to an end at home, new challenges emerged. Complicating matters further, the global banking system experienced turmoil in 2023, with bank failures affecting both the United States and Europe.

Notably, even though substantial regulatory changes such as the new scale-based framework have been implemented, some important financial reforms (such as bank privatization) have moved slower. Some of this delay stems from the understandable need to pivot between crises during the pandemic’s onset. Still, some vulnerabilities revealed by the failures of IL&FS, DHFL, and Yes Bank are yet to be fully addressed.

As India charts its course post-pandemic, it is crucial to maintain focus on financial reforms. We will delve deeper into these reform priorities in Part V.

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5.4. A Calm Amidst Global Storms (2023)

5.4.1. **Bank Failures in the US and Europe**

March 2023 marked a tumultuous period for the global banking system, with a wave of bank failures sweeping across the US and Europe. The epicenter of this financial earthquake was the collapse of Silicon Valley Bank (SVB), a titan in tech industry lending, on March 10. SVB found itself in the throes of a classic bank run as customers, fearing losses from its holding of long-dated securities, withdrew their deposits *en masse*. Despite the US government’s Federal Deposit Insurance Corporation (FDIC) stepping in to take control, the damage was irreversible.

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42. In the 2021 budget speech, the government announced intentions to privatize two state-run banks as a part of their disinvestment plan. NITI Aayog, in response, proposed two such banks for privatization to the disinvestment department in April 2021. However, by mid-2023, no final decision has been taken. The government also drafted the Banking Laws Amendment Bill in 2021 but it has not been introduced in Parliament yet. The bill aims to amend the Banking Companies Acts of 1970 and 1980 and make necessary changes to the Banking Regulation Act of 1949, with the goal of streamlining the privatization process of state-run banks. Media reports from mid-2023 suggest that the government is considering the formation of a panel to prepare a new list of public sector banks that could be potential candidates for privatization.
The fall of SVB sent shockwaves through the markets, leading investors to question the solvency and liquidity of other banks with similar profiles. The tremors reached Signature Bank, another US regional bank, which was shut down by the FDIC on March 13, after failing to meet its obligations to creditors and depositors. Signature Bank’s downfall was precipitated by its heavy investment in long-dated securities, which lost value due to delayed interest rate increases.

The crisis then crossed the Atlantic to Europe, where Credit Suisse, one of the continent’s largest and most influential banks, grappled with a liquidity crunch. Struggling for years to restore its profitability and reputation after a series of scandals and losses, Credit Suisse’s share price plummeted to a record low on March 15, as it failed to secure sufficient capital from markets or shareholders.

In response to this dire situation, the Swiss central bank and financial regulator intervened, brokering a takeover deal between Credit Suisse and its rival UBS. Announced on March 16, the deal saw UBS acquiring Credit Suisse’s core businesses and assets, while a ‘bad bank’ was left to wind down the remaining liabilities. This drastic measure was seen as a last-ditch effort to stave off a systemic collapse of the European banking system.

These bank failures in the US and Europe laid bare the vulnerability of many financial institutions to interest rate risk, as they had taken substantial positions in long-dated securities that depreciated due to delayed interest rate hikes. The crisis also unveiled the fragility of some banks’ balance sheets and liquidity positions, which had relied on short-term funding sources and risky assets to inflate their profits.

The crisis has sparked a debate about the adequacy of global banking regulation and supervision, as well as the effectiveness of crisis management and resolution mechanisms.

The aftermath of SVB’s collapse echoed worldwide, leading investors to contemplate the possibility of a similar collapse in their own countries.

5.4.2. Is the Indian Financial System Insulated?

In the wake of these global banking failures, the question arises: is the Indian financial system exposed to similar risks? Despite having grappled with crises like IL&FS, DHFL, and YES Bank, various factors suggest that India is unlikely to experience a collapse of this nature at present.

The primary reason for SVB’s collapse was an asset-liability mismatch in the wake of rapidly rising interest rates, triggered by persistently high inflation and geopolitical events like the Russian invasion of Ukraine. However, most Indian banks are better insulated against such risks due to stringent regulatory norms and a diversified loan portfolio.

Indian banks are required to invest a portion of their deposits in bonds, predominantly government securities, to meet the mandatory Statutory Liquidity Ratio (SLR). The Reserve Bank of India (RBI) has also put in place
enhanced held-to-maturity (HTM) limits to insulate SLR from mark-to-market losses.

Unlike SVB, which was heavily concentrated in Silicon Valley and largely funded start-ups and technology companies, most Indian banks have a geographically and industrially diverse deposit base.

Moreover, unlike SVB, which predominantly had bulk deposits, Indian banks’ deposits are granular, with retail deposits contributing nearly 60 percent of total deposits.

The resilience of the Indian financial system can also be attributed to the proactive decade-long repair and restructuring of the system—in part driven by RBI’s efforts to strengthen financial supervision. This initiative, which also targeted asset-liability mismatches following the IL&FS and DHFL defaults, fortified Indian banks and non-banks, preparing them to weather the global banking storm triggered by SVB’s default.

Additionally, the recent restructuring or merger of vulnerable banks, like YES Bank, helped effectively removed potential weak links. This further strengthened the system against significant risks.

In summary, while the collapse of SVB underscores the inherent risks associated with banking, the Indian financial system appears to be relatively well shielded from SVB-like shocks in the near term. Yet, banks or nonbanks could still face unexpected risks from areas of their balance sheets previously considered safer.

6. Part V: Challenges and Opportunities

As the Indian economy exits the acute phase of the pandemic, several structural challenges remain (which may remain hidden until the next crisis hits). At the same time, the authorities are confronted by a difficult global environment with high global inflation, still-rising interest rates, and major stress in the global banking system after the failures of Silicon Valley Bank and Credit Suisse in March 2023. On the domestic front, economic growth appears to be slowing down as per national accounts data from early 2023.

Against this backdrop, this section discusses the challenges ahead for the Indian financial system and outlines the necessary steps to ensure its long-term stability and resilience. This requires addressing three macro-financial structural challenges: (1) India’s Great Funding Imbalance, (2) India’s Financial Deepening Hurdle, and (3) India’s Macro-Finance Trilemma. In addition, a comprehensive approach to financial sector reform must include measures to enhance regulatory oversight, strengthen the balance sheets of financial

43. Note that a discussion of these three challenges also features as a Comment in the India Policy Forum 2023 (Agarwal Forthcoming).
institutions, improve risk management practices, and foster transparency and accountability. By addressing these fundamental vulnerabilities, India can build a more robust financial system capable of weathering future crises and supporting sustainable economic growth.

6.1. Challenge #1: India’s Great Funding Imbalance

Indian banks predominantly adhere to a traditional model, gathering funds from depositors and market borrowings to lend or invest. However, public and private banks in India exhibit stark differences in their funding sources. Private banks rely more on market borrowing, making them more susceptible to funding risks, while public banks benefit from a higher proportion of retail deposits.

In the 2010s, the banking landscape shifted as several public banks faced lending constraints under the RBI’s Prompt Corrective Action (PCA) framework, while private banks aggressively pursued deposit growth. However, the defaults of two major non-bank financial institutions (IL&FS and DHFL) in 2018 and 2019 disrupted wholesale and money markets, heightening competition for deposits and destabilizing funding for non-bank financial institutions.

The Great Funding Imbalance in India’s financial system stems from public sector banks and a few large private banks enjoying access to affordable depositor funding, while the rest of the system faces funding scarcity despite vast lending opportunities in the Indian economy. This results in higher borrowing costs for many Indian households and businesses, particularly those outside Tier 1 cities or big business houses.

We can see the greater reliance of private banks on market borrowing by examining the cross-linkages in the Indian financial system (Figure 26). In inter-sectoral exposure, mutual funds and insurance companies were the major fund providers to the system, while NBFCs and HFCs were the major receivers of funds. However, experience varied within the banking system: private banks were net receivers relative to the entire financial sector, and public banks were net providers. As Figure 26 demonstrates, the private banks’ dependence on the rest of the financial system is like that of the NBFCs and HFCs—highlighting their high non-deposit funding needs.

India’s Great Funding Imbalance was muted during the COVID crisis—mainly due to the RBI’s massive injections of aggregate liquidity. In the first 18 months of the pandemic alone (Feb 2020 to Sept. 2021), the RBI implemented liquidity measures worth 8.7 percent of the GDP. Even afterward, the RBI has kept the financial system flush with surplus liquidity, even though the acute phase of the pandemic is over. However, persistently high inflation may put greater pressure on the RBI to withdraw liquidity. Once the wave of aggregate liquidity recedes, the funding imbalance will become prominent again. This is especially concerning as many much-needed reforms in the financial system could not be prioritized due to the pandemic and remain unaddressed.
Any privatization efforts or reorganization of the Indian financial system is an opportunity to address the Great Funding Imbalance. A significant risk is that India’s retail deposit base becomes concentrated in the hands of a few large private banks. That scenario will lead to a persistence of the Imbalance, just under a different guise. Such an outcome is likely to hinder India’s growth significantly. Instead, ensuring better access to stable and cheap funding for medium-sized banks, NBFCs, and HFCs will potentially support convergence in incomes across states, rural and urban areas, and families. This may require some well-managed non-banks to become deposit takers. It will also require careful attention to the ex-post distribution of deposits in the banking system after the privatization of public banks.

To summarize, the concrete implication of challenge #1 is to situate the reorganization of the financial sector (including privatization efforts) amidst a broader strategy to address India’s Great Funding Imbalance. This could include the following steps:

- Design a path for well-managed non-bank financial institutions to convert into deposit-taking institutions.
- Consider mergers between strong and well-managed non-bank financial institutions and medium-sized (public and private) banks.
- Support the development of the wholesale funding market—including by reducing asymmetric information through frequent and transparent asset quality reviews. This will reduce the funding advantages of public banks, in turn helping address the underlying problems that lead to the need for privatization in the first place.

6.2. Challenge #2: India’s Financial Deepening Hurdle

The Financial Deepening Hurdle for India is the critical need to increase access to financial services across the country, including credit and insurance. One way to measure this challenge is through the credit-to-GDP ratio, which represents the amount of credit provided by banks relative to the size of the economy.

Bank credit-to-GDP ratios remain very low in poorer states—and are up to three times lower than those in richer states (see Figure 39). For instance, the bank credit-to-GDP ratio in Bihar and Uttar Pradesh, two of the country’s most populous states, is much lower than the national average. Bihar and Uttar Pradesh (where about 1 in 4 Indians live) have credit-to-GDP ratios between 25-30 percent, compared to the national average of over 55 percent. Many people in these states have limited access to credit, which can impede their ability to start businesses, invest in education or healthcare, and build wealth.

The dispersion in the credit-to-GDP ratio can have significant consequences for the overall growth and development of the country. When some regions have
limited access to credit, it can lead to a less efficient allocation of resources, hampering economic growth and exacerbating regional disparities.

In recent decades, the government of India has taken steps to address the financial deepening hurdle. For instance, the Pradhan Mantri Jan Dhan Yojana, a national financial inclusion program launched in 2014, aims to provide every household with access to basic financial services. And, as Figure 39 shows, there has been a modest increase in the credit ratios among the poorer states during the 2010s.

Yet, since the 1970s, India’s primary financial deepening tool has been Priority Sector Lending (PSL). Under this policy, banks must lend 40 percent of their total credit to agriculture, small-scale industries, and other marginalized sectors.

Banks that fall short of meeting the required percentage of lending to priority sectors can make up for the deficit in one of three ways. They either (i) purchase Priority Sector Lending Certificates (PSLCs) from other banks, or (ii) invest in Rural Infrastructure Development Fund (RIDF) deposits, or (iii) lend funds to non-bank institutions for “on-lending” to priority sectors. Private banks tend to be more active in buying PSLCs and in on-lending to non-banks to meet their priority lending targets—as public banks are more active in priority sectors due to their historical and social role. Thus, the burden of this policy de facto falls much more on the public sector banks than the private banks.

The priority sector lending policy has several shortcomings. For instance, the policy incentivizes banks to lend to specific sectors and areas, regardless of their creditworthiness. Also, the policy leads to a crowding-out effect, as banks divert funds from profitable sectors to meet their priority sector lending targets. This results in reduced profitability and competitiveness of banks, ultimately harming the economy. Lastly, it has increased financial stability risks as it has deepened interlinkages between banks and non-banks due to on-lending activities.

Overall, it will be important to assess how the reorganization of the financial sector interacts with the distortive effects of priority sector lending and related policies. Further, priority sector lending is a type of “push policy” as it pushes finance first and waits for growth to happen. Instead, there is a need for greater emphasis on “pull policies” that encourage the development of a pipeline of high-quality projects in all areas of the economy and improves financial literacy (RBI 2020; RBI 2021a). Without attention to such complementary policies, the privatization efforts may not yield the desired benefits and could even heighten the systemic interlinkages in the system.

To summarize, the concrete implication of challenge #2 is to ensure that India’s financial sector reform is part of a comprehensive strategy to overcome India’s Financial Deepening Hurdle. This could include the following steps:
• Assess the effectiveness and distortions of the priority sector lending and related policies.
• Place greater emphasis on “pull policies” to develop a strong pipeline of projects in neglected areas (e.g., through cash-flow-based lending and leveraging digital financial services).
• When choosing a pool of buyers, pay attention to the lending functions of public banks and their niches (e.g., geographies, sectors, etc.).

**Figure 40.** Bank Credit to GDP Ratio (%) across States

Source: RBI, Author’s calculations.
6.3. Challenge #3: India’s Growth Strategy Trilemma

The Growth Strategy Trilemma poses a complex challenge for governments seeking to balance economic growth, financial stability, and nurturing national champions. Pursuing any two of these objectives necessarily comes at the cost of partially sacrificing the third, thus making it a trilemma. I refer to this as the Growth Strategy Trilemma (see Figure 41), which is based on Agarwal (2023).

The Safe Champions strategy focuses on financial stability and reliable national players, sacrificing high economic growth. In India, the Tata and Bajaj Groups exemplify this strategy, maintaining long-term sustainability and dominating industries like steel and automobile production.

The Bold Champions strategy prioritizes aggressive growth and market-driven national champions at the expense of stability. The 2018 Infrastructure Leasing & Financial Services (IL&FS) crisis and other infrastructure lending episodes serve as examples of this strategy.

Fair-market capitalism emphasizes financial stability and economic growth without picking winners, instead promoting free entry. However, governments may avoid this strategy due to growth anxiety, fear of instability, or electoral cycles.

India’s financial sector reform faces the trilemma in at least four ways.

First, India has set in motion a large-scale plan to revamp its transport infrastructure with a projected expenditure of $1.7 trillion, equivalent to 8
percent of its GDP, within the next half-decade. As part of this initiative to enhance connectivity within ports, coal, steel, fertilizer, and food grain sectors, the government has designated 100 critical transport infrastructure projects for augmented investments. During the Budget speech for 2023-24, delivered on February 1, the Finance Minister stated these projects would be prioritized with a proposed investment of Rs 75,000 crore, inclusive of Rs 15,000 crore from private entities. As of 2023, capital expenditure on roads and railways accounts for about 11 percent of the central government’s capital spending, a fourfold increase from ten years ago. Despite the necessity of such infrastructure advancement to address significant growth bottlenecks in the country, any nation undergoing such swift capital spending growth could face governance challenges. In this context, it would be prudent for the authorities to exercise judicious support, avoiding any over-emphasis on ‘national champions’. Lessons from emerging markets have repeatedly shown that, under particular situations, large infrastructure conglomerates could encounter complexities including cronyism, politically-guided lending, inefficient project allocation, related party dealings, or substantial debt accumulation—all of which ultimately hurt the taxpayers and economic growth.

Second, the creation of the NaBFID in 2021 marks a renewed focus on development banks. India’s history of challenges in long-term infrastructure finance, as seen through the collapse of development finance institutions (DFIs) in the 1990s, public sector banks in the 2000s, and shadow banks like IL&FS in the 2010s, underscores the need for robust oversight in infrastructure lending. Financial institutions in this sector have often faced setbacks, leading to fiscal expenses. Addressing governance and structural concerns in lending is essential to ensure that the new development bank does not become a national champion that is subject to capital misallocation and fiscal costs in the long run.

Third, if the privatization of public sector banks is mishandled, it could unfairly favor established champions, leading to anti-competitive results and further cementing ‘too-big-to-fail’ financial institutions. It’s also crucial to guarantee that prospective owners are incentivized to extend their lending to underbanked areas or non-traditional sectors such as rural India or Tier 2 and 3 cities. Additionally, selecting winners during the privatization process could foster a monopolistic environment, thereby solidifying the supremacy of incumbent players in the financial system. This could inhibit the entry of new participants, curb competition, and obstruct innovation and growth. Moreover, centralizing deposits and power within a few large banks could worsen the macro-fiscal nexus, as these banks become more deeply involved with the government and pose a larger risk to fiscal stability during a crisis. All in all, policymakers must evaluate the implications of privatization initiatives and advocate for a more inclusive and robust financial system.

Fourth, the corporate sector may favor national champions, supporting ‘too-big-to-fail’ firms active across diverse sectors. The centralization of economic
activity in the hands of a few potent firms can result in capital market aberrations due to elements such as market power, asymmetric information, systemic risk, moral hazard, decreased competition, barriers to entry, and ineffective resource allocation. Large firms can secure favorable financial terms, overshadow smaller businesses, and create entry barriers, thereby promoting moral hazard and systemic risks. This may lead to asset mispricing, diminished innovation, and an overall decrease in productivity and economic growth. To counteract these distortions, policymakers can encourage competition, consider dismantling select large business conglomerates, improve financing opportunities for smaller businesses, and confront systemic risks tied to dominant firms.

To summarize, the concrete implication of challenge #3 is to pay careful attention to India’s Growth Strategy Trilemma when designing the financial sector reforms, competition policies, and infrastructure plans. This could include the following steps:

- Establish strong oversight and address governance, lending standards, and risk-sharing issues in long-term infrastructure financing—whether projects are budget financed or development bank financed.
- Mitigate fiscal vulnerability by spreading the risks associated with infrastructure projects and fostering the development of the corporate bond market. Alongside suitable protective measures, think about allowing a greater degree of foreign ownership as this could improve transparency and enforce accountability.
- In the privatization process, consider the ex-post market concentration in deposits and implications of 'too big to fail' when determining the potential buyers. Facilitate free market entry through simplified licensing and standardized regulations.

6.4. A Unique Opportunity: India’s Digital Revolution

India’s emergence as a global leader in digital payments, with the Unified Payments Interface (UPI) at its forefront, marks a significant stride toward digitizing the economy through the India Stack initiative. This initiative, designed to move the population into the digital age, is structured around a comprehensive four-layered model: Identity, Payments, Data, and Aggregators, with a particular emphasis on leveraging the Aggregators layer to unlock digital lending opportunities.44

44. See Carriere-Swallow et al. (2021a) and Carriere-Swallow et al. (2021b) for a discussion of the India Stack in the international context. Also, for a more detailed discussion on digital payments in India, see RBI (2021b) and RBI (2022).
Identity Layer (Aadhaar): Launched in 2010, Aadhaar introduced a biometrically authenticated digital identity system, issuing unique 12-digit IDs to citizens. This initiative has enrolled over 1.2 billion individuals, linking Aadhaar to bank accounts and enhancing financial inclusion by simplifying ID verification for banking and reducing fraud risks. The Pradhan Mantri Jan Dhan Yojana, aimed at universal bank account access, further capitalized on this infrastructure, significantly increasing the number of banked individuals and improving service delivery despite challenges of account inactivity.

Payments Layer (UPI): UPI, introduced in 2016, revolutionized India’s payment landscape by enabling instant bank-to-bank transactions via mobile platforms. As a cornerstone of the India Stack, UPI facilitated over $1 trillion in transactions by FY 2021–22, integrating 400 banks and processing billions of transactions monthly. This layer has democratized access to digital payments, benefiting small traders and contributing to financial inclusion and economic transparency.

Data Governance (DEPA): The Data Empowerment and Protection Architecture represents the third layer of India Stack, focusing on secure and consent-based data sharing. DEPA contrasts with global data governance models by prioritizing individual control over personal data, building on the digital identity and payment infrastructure to enhance access to financial services and ensure data privacy and security.

Aggregators Layer (AA): The Account Aggregators framework, a novel component of India Stack, facilitates secure financial data sharing, aiming to revolutionize financial services access. By enabling consented data flow between financial entities, AAs promise to lower barriers to credit, especially for underserved sectors like MSMEs, showcasing rapid growth and potential in enhancing financial inclusion.

To maximize the potential of digital lending in India, the following initiatives could be explored:

1. **Credit Scoring Based on Digital Transactions**: Develop a mechanism to assess creditworthiness based on UPI or digital transaction history. This would enable users, especially those with limited financial history, to build credit profiles and access formal financial services from banks and NBFCs.

2. **Expanding UPI’s Capabilities**: Allow non-banking entities, subject to meeting capital and prudential regulations, to issue credit cards or provide overdraft facilities via UPI. As of April 2023, the RBI has proposed expanding UPI’s digital payment capabilities to include credit offerings through pre-approved bank lines. This expansion could increase credit access and utilization on the UPI platform.

3. **Encouraging Peer-to-Peer Lending**: Support sandbox experiments to integrate peer-to-peer lending platforms within India Stack.
Simultaneously, ensure that regulations and data protection measures under DEPA preserve the safety and integrity of these transactions.

6.5. Orchestrating Reforms

India’s financial sector, standing at a pivotal juncture, holds the promise to drive long-term growth and promote inclusion. Realizing this potential requires a robust reform plan, one that addresses present challenges while capitalizing on emerging opportunities.

In conceptualizing this reform agenda, I have identified ten critical elements. When orchestrated together, these reforms could create a harmonious, resilient, and inclusive financial system—a foundation for sustainable, long-term growth that reaps benefits for the economy and society at large.

While Annexes I and II of the working paper version of this paper provide a deeper, more technical dissection of these ten elements, I present here a high-level overview using a metaphor. The ten elements can be grouped into three categories, akin to conducting a successful orchestra performance: Rhythm (Financial Stability), Harmony (Financial Sector Performance), and Melody (Financial Development and Access).

Steady Rhythm in Financial Stability. As in a symphony, a consistent rhythm is crucial. It sets the pace, binding disparate instruments together. In the financial realm, this rhythm signifies the stability imperative to keep the system on track and prevent disruptions. It encompasses the enhancement of regulation and supervision, systemic risk and asset quality management, improvement of the framework for handling bad loans, bankruptcy, and resolution, and the fortification of the toolkit for emergency liquidity assistance.

Harmony in Financial Sector Performance. Each instrument in an orchestra contributes to the overall harmony of the performance, producing a balanced ensemble. Likewise, the performance of different financial institutions in a competitive financial landscape is crucial, assuring system efficiency and profitability. This element covers the improvement of asset quality and infrastructure financing, the reform of public sector banks, and the restructuring of the financial sector.

Accessible Melody in Financial Sector Development. An orchestra aims to create an engaging melody that resonates with a broad audience. Similarly, financial sector development and inclusion represent the score that engages the wider society, particularly the underserved segments. This sphere covers financial sector deepening, the improvement of monetary policy transmission, and the support of real estate transactions.

I invite the readers to read Annex I and II in the working paper version to learn more about each of these elements.
In this orchestral analogy, the government assumes the role of the insightful conductor, coordinating the reform agenda elements to ensure harmonious, coherent outcomes. The government also charts the vision and trajectory for the financial sector, ensuring it aligns with the national objectives and aspirations.

**Final Thoughts**

With over 1.4 billion inhabitants, India represents about one-sixth of the world’s population. India’s financial system holds the key to its progress, impacting both the domestic and global economies as India claims a bigger share of the world output.

As the COVID-19 pandemic was about to strike, India was already wrestling with one of its most pronounced economic downturns. By March 2020, as the last quarter of the 2019-20 fiscal year wrapped up, GDP growth had tumbled to a mere 2.9 percent, significantly lower than the 7 percent decade average. For the first time in over a decade, aggregate investment—which forms a quarter of GDP—underwent continuous contraction, shrinking by over 4 percent across three back-to-back quarters. This paper contends that the Indian Financial Crisis of 2018-20 was the primary driver of this slowdown, underscoring the critical role of the financial system in India’s growth story.

Even with the current balance sheet improvements, a well-functioning financial system remains critical for saving mobilization, resource allocation enhancement, and risk diversification—all integral to India’s growth path.

Thus, the relevance of financial reforms in India’s economic narrative is undeniable. Yet, these reforms sometimes take a backseat in policy discussions, potentially due to the general public’s limited interaction with financial policies. This paper aspires to bridge this gap and foster wider participation in these pivotal debates.

The field abounds with intriguing and vital questions that remain unanswered. These explorations will greatly benefit from the engagement of a diverse community of scholars, policymakers, and the broader public. My hope is that this paper will serve as a guide for future work in this field and an analytical record of India’s experience with two unprecedented shocks—the Indian Financial Crisis of 2018-20 and the COVID pandemic of 2020-23.

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Introduction

The Indian financial landscape has experienced significant transformations over recent decades. Ruchir Agarwal presents intriguing and exhaustive data illustrating the evolution of financial intermediation in India. I recommend this insightful paper to anyone interested in Indian banking. My commentary, however, will not encompass the vast array of data he presents but will rather concentrate on the recent financial crisis in Indian banking to comprehend the underlying economic mechanisms. In particular, my focus will be on the default incidents of Infrastructure Leasing & Financial Services (IL&FS) and Piramal Capital and Housing Finance Limited [(earlier Dewan Housing Finance Corporation Ltd. (DHFL))], the emergence of shadow banking, and the ensuing macroeconomic repercussions. What triggered these defaults, and do they have implications for India’s growth narrative, if any?

Intermediation Channels and Bank Balance Sheets

Diamond and Dybvig (1983) underscore the vulnerability associated with maturity transformation. Banks perform maturity transformation by borrowing short-term and lending long-term, a process vital for economic growth yet making them susceptible to self-fulfilling runs, as explained by Diamond and Dybvig (1983). The risk of bank runs induced by coordination failure can be mitigated by deposit insurance, thus ensuring financial system stability. Banks’
assets are typically illiquid with longer maturities, while their liabilities are more liquid and short-term. This structure allows banks to earn returns on equity by paying lower interest on liabilities than the returns earned on assets. Shadow banks, such as securitization vehicles and money market mutual funds, also adopt this balance sheet structure but operate mostly outside the regulated banking system. While the Diamond–Dybvig model depicts a run induced by coordination failure, in the Dang, Gorton, and Holmström (2020) model, a financial crisis is essentially an information event. Adverse news about collateral backing short-term debt depreciates the debt, leading to a crisis due to the fear of adverse selection in securities, resulting in a reluctance to hold the debt. Such an event constitutes a financial crisis. To maintain information insensitivity, measures like issuing less debt, increasing the haircut in repos, shortening the maturity, or enhancing collateral can be adopted. Any of these crisis events in intermediation can have significant consequences for the macroeconomy. According to Bernanke (1983), the failure of banks disrupts established banking relationships, leading to severe credit crunches with significant macroeconomic repercussions. Data on U.S. per capita GDP illustrates the profound impact of banking activities during the Great Depression and more recently, the Great Recession. A substantial body of work provides empirical support for this mechanism. The intermediation failure to GDP effects, as highlighted by Bernanke, disrupts the intermediation of credit between lenders and borrowers, yielding severe credit constraints for bank-dependent borrowers and magnifying economic downturns. Collateral constraints (debt financing constraints) on borrowing, as shown by Gertler, Kiyotaki, and Prestipino (2020) and others, act as an additional magnification channel for macro shocks. Adverse net worth shocks on intermediaries limit their ability to raise capital and constrain their lending capabilities.

The NBFC Shock

In India, following the Asset Quality Review and demonetization, NBFCs emerged as significant credit providers, marking a shift in the financial intermediation landscape away from traditional banks. The default of shadow banks and the subsequent run on money market funds, which highlight a substantial systemic risk, a core idea in Ruchir Agarwal’s paper, is reproduced in Figure 1, depicting a graph taken from the paper. The defaults of the two shadow banks, labeled as ‘NBFC Shock Begins’, coincide with a decline in GDP. The NBFC shock pertains to the crises involving IL&FS and DHFL. Non-Banking Financial Companies (NBFCs) are shadow banks that lend long-term but rely on short-term non-deposit borrowing. IL&FS, established to finance infrastructure projects, became vulnerable due
to its high leverage ratio and reliance on short-term borrowing. The subsequent default by DHFL, closely following the IL&FS crisis, led to significant market panic. NBFCs had become a crucial credit provider credit to the economy recently. There was significant growth in NBFCs following the Asset Quality Review and demonetization. The paper argues that the government increased its focus on infrastructure in the 2000s, leading to rapid credit expansion by banks between 2005-2013 (25 percent year-over-year), with public banks playing a key role (accounting for 70 percent of the credit). By the early 2010s, this turned into what is termed as ‘zombie lending,’ followed by the Asset Quality Review (AQR) in 2014-15 to clean up banks. By the end of 2017, 11 public banks and 1 private bank were under the PCA framework. Figure 2 (also taken from the paper) documents the decline in lending by commercial banks.

**Identification: Liquidity versus Solvency**

Why did a small shock to NBFCs have a significant impact on mutual funds (MFs) and the macroeconomy?

The total exposure of MFs to the IL&FS group and DHFL was only 0.35 percent of the MF assets (or 0.025 percent of GDP). However, despite this minimal exposure, the defaults by IL&FS and later by DHFL on their debts led to major panic. Outflows from MFs in one month were 60 times and 40 times the exposure, respectively. The paper posits that MFs' large exposure resulted...
from a collapse in public bank lending toward capital-intensive investments, leading MFs to become providers of short-term capital to shadow banks. The IL&FS and DHFL defaults led to a significant run on mutual funds, highlighting the sensitivity of the financial sector to information and market sentiment.

Does this NBFC shock episode indicate a liquidity crisis, as the paper argues? The distinction is far from clear; it could represent either a liquidity crisis or a solvency crisis. Distinguishing between crises driven by liquidity and those driven by solvency is crucial for formulating appropriate policy responses, preventing inefficient asset liquidation, or avoiding unjustified bailouts. In a liquidity crisis, healthy firms collapse because they lack access to credit. The central bank can address such a crisis through the provision of temporary liquidity. On the other hand, in a solvency crisis, companies cannot survive despite any temporary liquidity provisions. The Central Bank is incapable of resolving a solvency crisis, which may occur if the economy enters a recession due to exogenous factors, such as a negative supply shock (e.g., a rise in input prices). The economic solvency of shadow bank investments remains a point of ambiguity. If the profitability of these investments is expected to decline, particularly with an expected decline in GDP, then a run on shadow banks is likely, which would subsequently impact their creditors, including mutual funds. The paper does not conclusively address this significant issue of channel identification and therefore, its policy implications are also somewhat unclear.

In the context of the 2008 Great Recession, Taylor and Williams (2009) highlight the distinct roles of liquidity versus counter-party risks. They argue that the turmoil in the interbank market was not merely a liquidity problem solvable by central bank liquidity tools. Instead, it primarily involved counter-
party risk (solvency issues), tracing back to the fundamental causes of the financial crisis.

Policy Questions and Considerations

Central Bank Intervention: The feasibility and mechanisms of central bank interventions in liquidity crises need to be both clear and politically viable. The trade-off between higher prospective growth through investments in capital-intensive projects (e.g., infrastructure) and the associated solvency risks necessitates careful evaluation of the funding model for a capital-starved economy.

Conclusion

The intricate interplay between financial intermediation, macroeconomic stability, and policy interventions underscores the complexity of managing a dynamic and interconnected financial system. The cases of IL&FS and DHFL defaults exemplify the systemic risks inherent in the financial architecture. Understanding the underlying mechanisms of crises, distinguishing between liquidity, solvency, and counter-party risks, and formulating prudent policy responses are paramount for maintaining financial stability and fostering sustainable economic growth in the Indian context.

References

In the run-up to the COVID-19 pandemic, the Indian economy was in a precarious condition, which manifested in a sharp decline in the real GDP growth rate from 8.9 percent in January–March 2018 to 2.9 percent in January–March 2020. This paper contends that the Indian Financial Crisis of 2018–19 inflicted widespread damage on the economy between 2018 and 2020, and was primarily responsible for the drastic growth contraction. Through this assertion, the paper highlights the role of the financial sector in India’s growth story. In addition, it also describes the COVID-19 pandemic of 2020–2023, focusing on the policy responses by the Government to tackle the financial challenges that had arisen in the pre-pandemic period.

The paper emphasizes that the actions taken by the Government during this period were responsible for bolstering a fragile financial system and shielded Indian banks against the shocks faced by the Western banking system in 2023. Finally, the paper discusses at length three challenges that the Indian economy faces, namely, a funding imbalance between shadow banks and traditional banks; lack of credit accessibility; and striking a balance between growth, financial stability, and nurturing national champions. The paper also talks about the potential of India’s digital payments revolution and concludes that India’s growth is a critical function of financial sector reforms.

This is an extensive and voluminous paper that covers a wide gamut of issues involving various facets of the Indian financial sector. In particular, it provides a comprehensive description of the manner in which the Non-Banking Financial Company (NBFC) defaults of 2018–19 impacted the rest of the financial sector and the larger economy. My comments are divided into three broad sections: (i) Main Thesis of the Paper, (ii) Objective of the Paper, and (iii) Some Gaps in the Paper, as detailed below.

**Main Thesis of the Paper**

According to the paper, the default by two large NBFCs triggered a macro-financial spiral, which in turn, led to a sharp slowdown in the Indian economy. This thesis is based on a somewhat narrow view and does not pay adequate attention to the developments in the financial sector that unfolded during the decade preceding the pandemic, and in particular, to the protracted problems in the banking sector that were also responsible for the economic slowdown.

In India, NBFCs (net of bank credit) account for less than 3 percent of the total commercial (non-government) credit whereas banks contribute more than
65 percent. Banks are the largest providers of credit. While it is true that in the last decade, the NBFCs also emerged as important sources of credit, the banking system accounts for nearly half of the funding for these NBFCs. The non-performing loans crisis that engulfed the Indian banking sector roughly from 2013 to 2019 was arguably bigger, and more severe in terms of its impact on the real economy as compared to the NBFC defaults, and this does not receive a commensurately nuanced treatment in the paper. While the paper mentions some of the developments in the banking sector, it constitutes only a small portion of the entire description provided and there too, the motivation seems to be to explain the rise of the NBFC sector, as opposed to connecting these developments to the economic slowdown. Given the near simultaneous occurrence of problems in these two sectors and their close interconnections, it is also difficult to disentangle the effects and attribute the economic slowdown to any one of these two sectors.

Moreover, by the time the Infrastructure Leasing & Financial Services (IL&FS) default took place in September 2018, the economy was already in significant stress. In India, official GDP data, especially the 2011-12 base year series, suffers from a wide range of measurement issues and the credibility and reliability of this data have been repeatedly questioned over the years by a number of experts (see for example, Sapre and Sinha 2016; Dholakia et al. 2018; Nagaraj et al. 2019; and Subramanian 2019; among others). This GDP series shows that the economy was growing on average at 7 percent during the decade preceding the pandemic. However, multiple high-frequency indicators show that the economic slowdown had started much before the NBFC defaults took place and the NBFC crisis amplified the existing stress in the system.

**Banking Sector Crisis**

During the period from roughly 2014 to 2019, the Indian economy was grappling with the Twin Balance Sheet (TBS) crisis, which manifested in the form of high levels of Non-Performing Assets (NPAs) on bank balance sheets, especially for the inadequately capitalized public sector banks (PSBs), combined with over-leveraged and financially stressed companies in the private corporate sector (see, for example, Government of India 2017; Sengupta and Vardhan 2017; 2019; 2022).

After several years of staggering credit growth in the banking sector, there was a steep increase in the proportion of restructured loans in total loans from roughly 2008 to 2013 (Figure 1). A slew of restructuring schemes initiated by the Reserve Bank of India (RBI) (such as Corporate Debt Restructuring scheme or CDR, Strategic Debt Restructuring scheme or SDR, Scheme for Sustainable Structuring of Stressed Assets or S4A, etc.) enabled banks, especially PSBs, to
hide the bad loans, and engage in “loan evergreening”. This often amounted to banks lending to financially stressed companies at the expense of the healthier ones, and hence resulted in capital misallocation.

**FIGURE 1.** Share of Restructured Loans in Total Advances of Public Sector and Private Banks

![Graph showing share of restructured loans in total advances of public sector and private banks from 2005 to 2018.]

In 2015-16, the RBI introduced the Asset Quality Review (AQR), which forced all banks to recognize the bad loans on their balance sheets. Consequently, the gross NPAs increased manifold and by 2018, reached a level of almost 14 percent of the total loans (Sengupta and Vardhan 2022). It was significantly more acute for PSBs (Figure 2). According to the paper, the RBI recognized the problem in the banking sector and implemented the AQR to resolve it. However, the paper is silent about the role played by the RBI in the pre-AQR period in aggravating the problem through the alphabet soup of restructuring schemes, which suppressed the true extent of the problem for years, and deferred NPA recognition, thereby further weakening the balance sheets of the banks. The paper also does not talk in detail about the TBS crisis, and only mentions the NPAs in the banking sector.
In reality, alongside the banking sector, the corporate balance sheets were also severely stressed. Credit Suisse reported that by early 2017, around 40 percent of the corporate debt monitored by it was owed by companies that had an interest coverage ratio of less than 1; they did not earn enough to pay the interest obligations on their loans. The stress in the private corporate sector, especially in the large, infrastructure companies, was a critical factor in the TBS crisis, which adversely impacted the real economy.

What is also missing in the paper is a detailed discussion of the various ways in which this crisis dealt a severe blow to the larger economy, presumably a shock that the economy was still reeling from by the time the pandemic hit India in 2020. On one hand, the punitive actions taken by both the RBI and the Government to address the TBS crisis resulted in heightened risk aversion in the banking sector, as demonstrated by a decline in the risk asset density, which is the ratio of risk weighted assets to total assets of the banking system. This ratio which was 65 percent until 2016, and dropped below 55 percent by 2020 (Figure 3). The growing risk aversion in the banking sector was also reflected in the rising share of investments in safe government securities (called the Statutory Liquidity Ratio or SLR investments). Against the regulatory requirement of 18 percent, the banks’ investment in SLR securities increased to more than 22 percent of Net Time and Demand Liabilities.

On the other hand, the balance sheet stress faced by the private corporate sector resulted in a collapse of demand for credit, both for capacity expansion...
as well as for working capital requirements. In fact, the pre-pandemic period witnessed a remarkable deleveraging trend in the corporate sector. Large companies systematically reduced their leverage, especially from 2015 onwards.

**Figure 3. NPAs and Risk Aversion in the Banking Sector**

![Gross NPAs and Risk Weighted Assets/Total Assets](chart)

<table>
<thead>
<tr>
<th>Risk Asset Density (RHS)</th>
<th>Gross NPA % (LHS)</th>
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<tbody>
<tr>
<td>FY12 FY13 FY14 FY15 FY16 FY17 FY18 FY19 FY20 FY21 FY22</td>
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Source: Sengupta and Vardhan (2022).

The net result was a dramatic decline in bank credit, the biggest source of commercial credit in the economy. Even before the NBFC crisis, by 2017, total bank credit was growing at a decade’s low of 8.4 percent per year.\(^1\) The growth rate of bank credit fell from 14.6 percent in 2011–15 to 8.8 percent in 2016–2020 (see Sengupta and Vardhan 2022). The share of the banking sector in total commercial credit declined from 73 percent in 2011 to 63 percent in 2018. The banks gradually reduced their share of credit to industry [large companies and Micro, Small and Medium Enterprises (MSMEs)] and increasingly began to focus on lower-risk weight carrying retail loans (Figure 4). The share of industry in bank credit fell from 44 percent in 2011 to 35 percent in 2018 and during this period, the share of consumer credit increased from 19 percent to 25 percent, thereby ushering in a phase of “consumerisation of bank credit” (see Sengupta and Vardhan 2021).

\(^1\) All growth rates reported here are Compound Annual Growth Rates (CAGRs).

Source: Sengupta and Vardhan (2022).
Note: The numbers on the stack bars are the share of the segment in overall credit. Years are financial years ending March of that year. Credit refers to total commercial or non-government credit.
While the paper talks about the decline in lending growth of PSBs, it misses the important point about increase in risk aversion of the banking sector, which continued well into the pandemic and was also arguably one of the factors responsible for the shift in focus of the banks from lending to industry to lending to retail sector; this, in turn, has a direct implication for GDP growth.

Along with the sharp decline in bank credit growth, and fall in the share of industrial credit, another important feature of the decade preceding the pandemic was the steady deterioration in private sector investment. The paper looks at official data on Gross Fixed Capital Formation and concludes that in 2019–20, for the first in more than a decade, aggregate investment contracted by more than 4 percent over three consecutive quarters.

However, data from the Capex database of the Centre for Monitoring Indian Economy clearly shows that in nominal terms, private sector projects (across all industries) under implementation, an indicator of the strength of economic activity, had been steadily declining from 2013 onwards. Likewise, announcements of new projects in the private sector, an indicator of business optimism, had been falling in nominal terms from 2011 onwards, and after a brief recovery during 2015–2017, began falling again from 2017 onwards. In other words, private sector investment in India, one of the primary drivers of economic growth, had been deteriorating much before the NBFC crisis of 2018.

The economic slowdown that gets reflected in the official data in the run-up to the pandemic in 2019-20 was, therefore, not simply a function of the NBFC defaults of 2018-19 and resultant repercussions on the financial sector, but also of the prolonged crisis in the banking sector and the private corporate sector, which led to an investment collapse. As mentioned earlier, it is difficult to disentangle causality and attribute the slowdown only to the problems in the NBFC sector.

**Objective of the Paper**

The paper, on one hand, covers a wide spectrum of myriad issues, such as the health of the financial system, policy actions during the pandemic, India’s economic growth strategy, digital revolution, and financial sector reforms. On the other hand, it is also quite narrow in its focus, with the main emphasis on the NBFC crisis and the repercussions thereof. As a result, the objective of the paper is not clear nor is the motivation properly laid out. It would have been better if the paper had a core point around which a comprehensive and relevant discussion could be centered.

Relatively, the title of the paper gives the impression that it will include a detailed discourse on the important developments in every critical segment of the Indian financial sector in the past as well as throw light on the potential new developments in the financial landscape going forward, and the associated
challenges and opportunities. Yet, the paper looks at only a specific set of financial sector entities, namely the banks, and to some extent, mutual funds, but predominantly the NBFCs.

The financial sector in India does not only consist of these institutions but markets such as the equity market and debt market, among others, also matter substantially for the overall economic growth. In fact, these markets have grown in importance over the last several years. For instance, the share of the bond market in total commercial credit went up from 16 percent in 2011 to 20 percent in 2020. During this decade-long period, credit from the bond market outpaced that from banks with a CAGR of 15.5 percent as against 11.3 percent for bank credit. Credit through the commercial paper market also grew faster than bank credit. But the paper does not include a discussion of these markets and only mentions them to describe the impact of the NBFC crisis. Even in the context of financial institutions, the paper is silent about the role played by the private equity funds in facilitating the deleveraging process of the large companies during the TBS crisis or about the growing importance of pension funds and insurance companies as investors in the bond market or about the emergence of a private credit market in India led by the Alternative Investment Funds (AIFs).

To improve its focus, maybe the paper could talk about the past and future of India’s institutional credit landscape. Alternatively, it could focus only on the NBFC crisis of 2018–19 and its ramifications for the economy. However, an extensive literature exists on both these topics in India and the paper would need to add value to contribute to that literature in a meaningful manner. This also highlights the gaps in the literature review that is included in the paper. Several Indian studies on the financial sector have not been referred to even though these studies have already described many of the issues touched upon (see, for example, Sengupta and Vardhan 2022; Sengupta, Son, and Vardhan 2021; among others).

Some Gaps in the Paper

I have mentioned here a few important gaps in the paper, with the objective that addressing these might help to improve the paper. For instance, the paper discusses at length the problems in the real estate sector of India during the period from 2013 to 2018. The critical problem of the last decade, especially in the context of stress in the Indian financial sector, was, however, in the infrastructure (comprising roads, ports, power, aviation, telecommunications) sector. In fact, the 12 largest corporate default cases against which the RBI directed the banks to trigger the IBC in 2017, were all in the infrastructure space. A commensurate discussion of this issue is missing in the paper.
Secondly, it is important to note that the NBFCs are not a monolith in India; instead they are highly heterogenous. This is relevant because depending on their size and ownership, the NBFCs were impacted differently by the default of IL&FS. For instance, the top 20–25 NBFCs, which account for nearly 70 percent of the total NBFC loan book, could still issue bonds after the crisis but at higher costs. They also had access to bank funding. It was mostly the small and mid-sized NBFCs, which in any case cannot access the bond market, that suffered the most because bank funding to them shrank in 2018–19. The paper is also silent about why the NBFCs failed; it was a function of unsustainable credit growth and hence, it might help to have a discussion on the role of suitable credit risk assessment, which applies to the banking sector as well.

Third, the paper mentions that the dependence of the private banks on the financial system is similar to that of NBFCs and Housing Finance Companies (HFCs) because of their reliance on market borrowing for funding themselves. Comparing banks and NBFCs on the basis of their liability structures is inherently problematic. Indian banks, private or public, cannot issue bonds other than capital bonds (i.e., Tier 1 and Tier 2 bonds) unlike NBFCs for which a substantial portion of the overall funding (around 30 percent for the whole system and more than 50 percent for large bonds) comes from bonds. On the other hand, while NBFCs do not have access to public deposits, these constitute more than 70 percent of bank funding. Another related and important point that the paper misses is that the stress on the debt mutual funds (such as the Franklin Templeton case) following the NBFC defaults effectively helped the banks garner deposits as investors moved away from debt funds to banks.

Fourth, a critical factor that aggravated the problems in the Indian financial sector, especially the banking sector, during the decade preceding the pandemic was weakness in banking regulation and supervision. This was responsible not only for the worsening of the NPA problem in the PSBs but also for the fragilities in private banks such as ICICI Bank, Axis Bank, and Yes Bank, all of which unfolded during this period. While the paper discusses the steps taken by the RBI to deal with the NPA problem or the Yes Bank crisis, it is remarkably silent about how lax supervision and regulatory weaknesses on the part of the RBI led to these problems in the first place.

Fifth, in the context of the funding imbalance mentioned in the paper, it is important to note that there is indeed a comparative advantage here. The PSBs are good at getting deposits (because their social mission calls for them to establish branches in places that the private banks cannot do profitable business in), while the private banks are good at identifying lending opportunities. There is no way to alter this situation, short of privatizing the PSBs, and even if the PSBs are privatized, which is nearly impossible in the Indian political environment, the government is likely to insist that it maintain its village branches. So, the proper objective of the RBI must be to minimize the risks that arise from this structural situation. Private sector banks or NBFCs might need to hold more capital or
have less risky loan portfolios, to take account of the fact that their liabilities are more likely to run. Relatedly, the suggestion that well-managed NBFCs should convert into deposit-taking institutions is also problematic. RBI stopped giving licenses to deposit-taking NBFCs back in the 1990s and converting NBFCs into banks will rob them of their comparative advantages and defeat the purpose of having a non-banking sector in the first place.

Finally, given that the paper also talks about the future of Indian finance, some interesting developments in the financial sector that might become crucial going forward and might usher in structural changes in the overall financial landscape are conspicuous by their absence in the paper. These include the emergence of a private credit market led by credit AIFs, the shift of banks from lending to industries to lending to the retail sector and the consequent consumerization of bank credit, the growing importance of the bond market, especially for the highly-rated companies, the emergence as a result of a less bank-centric credit ecosystem, and the potential shift of credit oversight and regulation from the RBI to the Securities and Exchange Board of India (SEBI). In particular, while the banking sector health may have improved significantly as compared to the days of the TBS crisis, the resumption of bank credit growth, however, has been primarily driven by growth in unsecured consumer credit and home loans. Lending to industry has not shown any substantial improvement and this has a direct bearing on the future investment and growth path of the Indian economy. The RBI’s latest Financial Stability Report shows that the growth rate of bank loans to industry fell from close to 10 percent in 2021-22 to 4.9 percent in 2022-23.

In summary, there is a lot of good material in the paper and some are presented in elaborate detail. I would recommend sharpening the focus of the paper and plugging in some of the gaps mentioned above and also positioning the paper in the context of the existing Indian literature to highlight the value-added.

References


General Discussion

Arvind Panagariya commenced the discussion by raising the question regarding the timing of the RBI’s response to the financial crisis. He pointed out that concerns about the crisis were evident as early as 2013, and he had himself written about it in 2014. He wondered as to why the RBI had waited until 2015 to take action, suggesting that earlier intervention might have been more effective in addressing the crisis. He acknowledged the importance of Ruchir Agarwal’s paper in shedding light on Non-Banking Finance Companies (NBFCs) and their role in the financial crisis. He concurred with the point raised by Rajeswari Sengupta that the financial crisis had been going on for an extended period and that the banking crisis was occurring alongside other significant developments. This underscores the complexity and interconnected nature of financial crises and their impact on the broader economy.

Rajeswari Sengupta argued that the political economy had played a significant role in the delay, given that a large portion of Indian banks were government-owned, and the Non-Performing Assets (NPAs) of public sector banks accounted for a substantial share of the total loans. Stopping restructuring schemes and mandating NPA disclosures would have required banks to set aside significant capital to cover losses, which would ultimately have had to come from the government. This complex situation likely contributed to the delay in
taking decisive action. She also emphasized that the government’s willingness to recapitalize the banking sector played a crucial role in determining the RBI’s actions. The Asset Quality Review was a turning point, revealing the inadequacy of capital in many banks. Subsequently, the government had to grapple with political and economic challenges to determine how much capital it could provide to the banks, leading to significant losses for public sector banks as they had to accept substantial haircuts during the Insolvency and Bankruptcy Code (IBC) process. She also clarified that the RBI did not have the discretion to end the restructuring schemes earlier, and suggested re-orienting the focus of the paper to address specific aspects of the NBFC crisis rather than the broader economic slowdown.

Ravi Bansal commented on the paper’s lack of details regarding the price of the transfer to the new government structure and its current valuation. He, however, noted that the positive aspect was that the government did not incur any financial losses in this process. He asserted that this transfer appeared more like a liquidity event, indicating the need for a robust mechanism to manage such situations if and when they recur in the future.

Surjit Bhalla raised two points regarding the discussion. First, he questioned how a solvency crisis could be identified without a preceding liquidity issue. He noted that liquidity problems resulting in high interest rates or a slowdown could be understood, but the reverse causality was less clear. Second, he talked about the time frame given in the paper, and expressed disagreement with the argument that the paper solely focused on the period from 2018 to 2020, as the paper also extensively discussed events dating back to 2014, leading up to the period 2018-20. However, the paper did not comment on whether these actions were necessary or not. He emphasized that infrastructure projects worldwide often lead to the creation of supernormal profits and rents; and taxing these supernormal profits is an effective way of addressing the political economy problems associated with infrastructure development, including issues related to rents and bailouts. This approach is well-recognized globally and aligns with the need for market mechanisms to correct such problems. Foregrounding the unique challenge caused by the exemption of taxation on agriculture, land, or property in the country, he noted that since a significant portion of infrastructure projects is carried out in rural areas, this lack of taxation on agriculture creates additional challenges.

Martin Wolf commented on the broader financial crisis and the state of balance sheets of public sector banks. According to him, a significant challenge in addressing these issues is the reluctance of politicians to acknowledge the extent of the problem and the potential need for capital increases in these banks. He noted that this reluctance is not unique to any specific country but is a common challenge. The second question he posed was whether it is reasonable to conclude that the challenges in the Indian banking and financial system are over, and if it can now support sustainable growth. He also touched
upon the complex issue of financing infrastructure, highlighting the importance of revenue capture in infrastructure projects, and averred that the feasibility of revenue capture is not just a regulatory matter but often a political one. He further noted that successful infrastructure projects often lead to increased property prices. One way to achieve revenue capture, especially when the public sector is involved in financing, is through mechanisms related to land, such as land prices, land rents, or land taxes.

Ratna Sahay outlined the RBI’s role in risk assessment and whether it had been aware of certain risks but may have disregarded them for political reasons. She also posed a question on risk assessment in the context of financial stability and infrastructure financing. Responding to an earlier observation regarding land taxes in China, she pointed out that comparing land ownership models between China and India is not entirely fair. In China, individuals cannot own land; instead, they hold long-term leases, typically for 99 years or similar durations. In this system, land benefits primarily accrue to local and provincial governments.

Ram Singh discussed the challenges related to the funding of infrastructure projects, particularly the constraint posed by political and economic factors. He mentioned that property or land taxes are typically levied and regulated by municipalities and State governments, which can limit their use in federally-funded projects. Proposing an innovative approach for infrastructure funding, he suggested that in the case of road or railway projects that involve land acquisition, the government could explore the option of acquiring land and then renting it out for various purposes. He cited the example of the Delhi airport as an experiment in this direction. This approach could potentially provide an alternative revenue source for funding infrastructure projects, addressing some of the challenges associated with traditional funding models. Touching upon the issue of co-funding of infrastructure projects, he cited the example of the Yamuna Expressway or Taj Expressway project, funded by the JP Group, which entailed the development of five townships as part of the overall plan. However, these mechanisms necessitate drawing up well-designed contracts with the private sector. He also noted that there is a perception among policymakers that the public sector may not always get a fair deal in such arrangements, leading to risk aversion toward adopting this approach.

Poonam Gupta highlighted the evolving landscape of infrastructure finance, suggesting that what is currently referred to as infrastructure finance will soon be recognized as climate finance. She drew parallels between the challenges of financing infrastructure and climate-related projects, particularly the question of who would bear the financial burden. She mentioned Martin Wolf’s idea of property tax as a potential source of funding. Additionally, she referred to the previous day’s discussion about privatizing State-owned assets, noting the possible challenges in this approach, including the size and ease of privatization. She also raised the issue of financial intermediation, emphasizing
the complexities involved in both securing financing and effectively channeling it to the intended projects. She also alluded to her earlier NCAER paper titled, “Slowdown in 2019-20: Enigma or Anomaly”, which had explored three hypotheses and contributing factors to the slowdown, carefully analyzing data down to the last available data point. The paper concluded that it was indeed an anomalous year, and while banking sector issues did not appear to be an additional contributing factor that year, two other factors were at play: the onset of COVID-19, which began impacting economic activity in the last quarter of that year, and the slowdown in global trade.

Charan Singh shared insights from his experience as the chairman of a government-owned public sector bank with a significant branch network. He reflected on the evolution of banking institutions in India, noting that earlier, development institutions like IDBI and private sector banks like ICICI played a substantial role in infrastructure financing. However, during a phase when India transitioned to universal banks, many of these institutions merged, including the recent reverse merger of HDFC. He highlighted that public sector banks increasingly entered infrastructure financing during this phase, which subsequently led to the rise of NPAs. These banks were originally commercial banks and were not necessarily equipped to assess the commercial viability of infrastructure projects. The Government had also established the National Bank for Financing Infrastructure and Development (NaBFID) to address these issues. He further clarified that the shift from infrastructure financing to retail lending, particularly in housing, is a relatively recent development and is seen to be highly collateralized.

Manish Sabharwal expanded on Arvind’s earlier comment regarding discretion and the recognition of bad loans in State-owned banks. He provided specific data, noting that corporate lending by State-owned banks increased from Rs 18 lakh crores to 52 lakh crores between 2008 and 2014. This increase in lending was the result of a voluntary decision by the banks, and exceeded what may be referred to as the ‘speed limit’. He highlighted that there was a ‘tone from the top’ at the RBI, indicating that regulatory forbearance was necessary to facilitate infrastructure development. This tone was set within the RBI itself rather than being an external influence. He pointed out that the liquidity and solvency crises were mainly associated with private sector banks, suggesting that public sector banks could declare significant NPAs without causing a corresponding significant change in deposits. There was discretion and awareness of the NPAs in public sector banks, but there were no immediate constraints on revealing the extent of the NPAs because depositors believed in the sovereign guarantee for the vast deposits held by nationalized banks.

The Chair, Ratna Sahay, concluded the discussion by asserting that the answer to the critical question about accountability during financial crises might vary depending on the specific circumstances of the crisis. However, it is important
to understand and establish accountability in order to prevent similar crises from occurring in the future. She highlighted the need for clear mechanisms and responsible parties to address financial crises and their underlying causes effectively. This is a crucial aspect of financial regulation and oversight to ensure stability and prevent systemic risks.

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