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FINANCIAL INCLUSION AND ACCESS IN INDIA: ANALYSIS USING A STRUCTURAL MODEL¹

Greater financial inclusion and enhanced access to credit have been longstanding policy objectives in India. Concerted policy efforts have been made towards these objectives, such as increasing access to the formal financial system by the agricultural sector and small and medium-size enterprises. This chapter examines India's efforts at financial inclusion and related outcomes, and then analyzes the effect of greater financial access on macroeconomic indicators, such as GDP growth, as well as inequality and financial stability using a micro-founded general equilibrium model.

1. While India scores well on creating an enabling environment for financial inclusion, outcomes lag peer countries.

On the household side, survey data indicate that about 59 percent of households had bank accounts at the time of the 2011 Census of India. Furthermore, there is considerable variation across the population, as people in rural areas, women and low-income individuals are even less likely to be part of the formal financial system. Furthermore, despite increasing financial deepening (measured by the credit-to-GDP ratio), access to credit has improved mostly for relatively large firms, indicating that smaller firms face constraints in accessing finance. As a result, potential entrepreneurs do not have access to working capital and investment funding at reasonable rates, dragging down growth. Despite having the Priority Sector Lending program in place to channel resources to SMEs (as well as agriculture), ninety percent of small firms do not have access to bank services (Mor Committee, 2014). Tackling financial exclusion, as well as addressing inequality more broadly, has been an important policy priority in India for many years (Box 1). This chapter focuses on firms' access to finance, given the absence of detailed financial data at the household level, and models different constraints and the impact of removing them on growth and inequality.

Model Description and Data

2. Obstacles to financial inclusion in emerging market and developing countries vary and can be grouped into three broad categories:

- **Access barriers.** These typically reflect high documentation requirements by banks for opening, maintaining, and closing accounts, and for loan applications. Also they reflect various forms of immeasurable rationing, including red tape and the need for informal guarantors as connections to access finance. These obstacles increase the cost of participation in the financial system.
- **Obstacles to depth.** The amount firms can borrow is generally determined by collateral requirements, which depend on the state of creditors' rights, information disclosure requirements, and contract enforcement procedures, among others.

¹ Prepared by Era Dabla-Norris, Sonali Jain-Chandra, D. Filiz Unsal and Eva Van Leemput.

- **Intermediation efficiency.** This is generally associated with the state of competition and the degree of asymmetric information facing financial institutions, and is reflected in interest spreads and banks' overhead costs.

3. The analysis of financial access by firms along these three dimensions is based on the micro-founded general equilibrium model developed by Dabla-Norris et al (2015). This overlapping generations model features heterogeneous agents who are distinguished from each other by wealth and talent, and who choose in each period whether to become an entrepreneur or to work for a wage. In equilibrium, only talented agents with a certain level of wealth choose to be entrepreneurs, while the untalented and those who are talented but wealth-constrained choose to be workers. There are two states of world, or "financial regimes," one with credit and one with savings only. Individuals in the savings regime can save but cannot borrow. Participation in the savings regime is free, but (following Greenwood and Jovanovic (1990) and Townsend and Ueda (2006)) to borrow, i.e. to move into the finance regime, individuals must pay a participation cost whose size is one of the determinants of financial inclusion. Once in the credit regime individuals may obtain credit but its size is constrained due to limited commitment (i.e. poor contract enforceability) which leads to the need to post collateral as Evans and Jovanovic (1989). Thus collateral is another determinant of financial inclusion affecting financial sector depth. Finally, because of asymmetric information between banks and borrowers, higher interest rates are charged on borrowing to account for costly monitoring of highly leveraged firms following Townsend (1979). Because more productive and poorer agents are more likely to be highly leveraged the higher intermediation cost would be another source of inefficiency and financial exclusion.

4. The model provides a framework for examining the linkages between financial inclusion, output, and inequality. In the model, greater financial inclusion affects output and inequality (as measured by the Gini coefficient) mainly through two channels. First, it allows for a more efficient allocation of funds among entrepreneurs, thereby increasing aggregate output. This occurs as funds are channeled to talented entrepreneurs, increasing their output disproportionately more than that of less-talented ones. Second, more efficient financial contracts limit waste from financial frictions (e.g., the credit participation and monitoring costs) leading to higher GDP. If increased output is achieved through the reallocation of funds to more talented, higher-income entrepreneurs, income inequality can rise in theory. In fact, different dimensions of financial inclusion can result in different distributional consequences. Financial inclusion through lower credit participation costs can crowd-in relatively untalented individuals, and thereby benefit the poor, while wealthy individuals can lose somewhat as a result of higher interest rates and wages.

5. In the baseline, the model is calibrated to Indian data to analyze financial access. Firm-level data for 2005 from the World Bank Enterprise Survey are used, in addition to standard macroeconomic and financial variables (saving rate, NPL ratio, and interest rate spread). The parameters are estimated by matching the simulated moments to actual data. The gross savings rate is matched to estimate the bequest rate, ω ; the average value of collateral is used to calibrate the degree of financial friction stemming from limited commitment, λ ; while the financial participation cost, ψ , intermediation cost, χ , recovery rate, η , probability of failure, p , and the parameter governing the talent distribution, ρ ,

are jointly estimated to match the moments of the percentage of entrepreneurs with credit, NPLs as a percent of total loans, interest rate spread, and the employment share distribution (using four brackets of employment shares—top 5%, 10%, 20%, and 40%).

Results

6. We conduct policy experiments to identify the most binding constraint to financial inclusion and access in India and study the macroeconomic effects of removing these frictions. In the first experiment, we simulate policy-induced changes in financial access and analyze their effects. The simulations are performed for both 2005 and 2009 to shed some light on the dynamic aspects of financial inclusion. Three simulations include: (i) reducing the financial participation cost, ψ , (ii) relaxing borrowing constraints in the form of collateral requirements, λ , and (iii) increasing intermediation efficiency, χ .² Figures 1–3 present the simulation results. In the second experiment, the impact of priority sector lending (PSL) on output and inequality is quantitatively assessed through a counterfactual policy evaluation.

Reducing Participation Cost

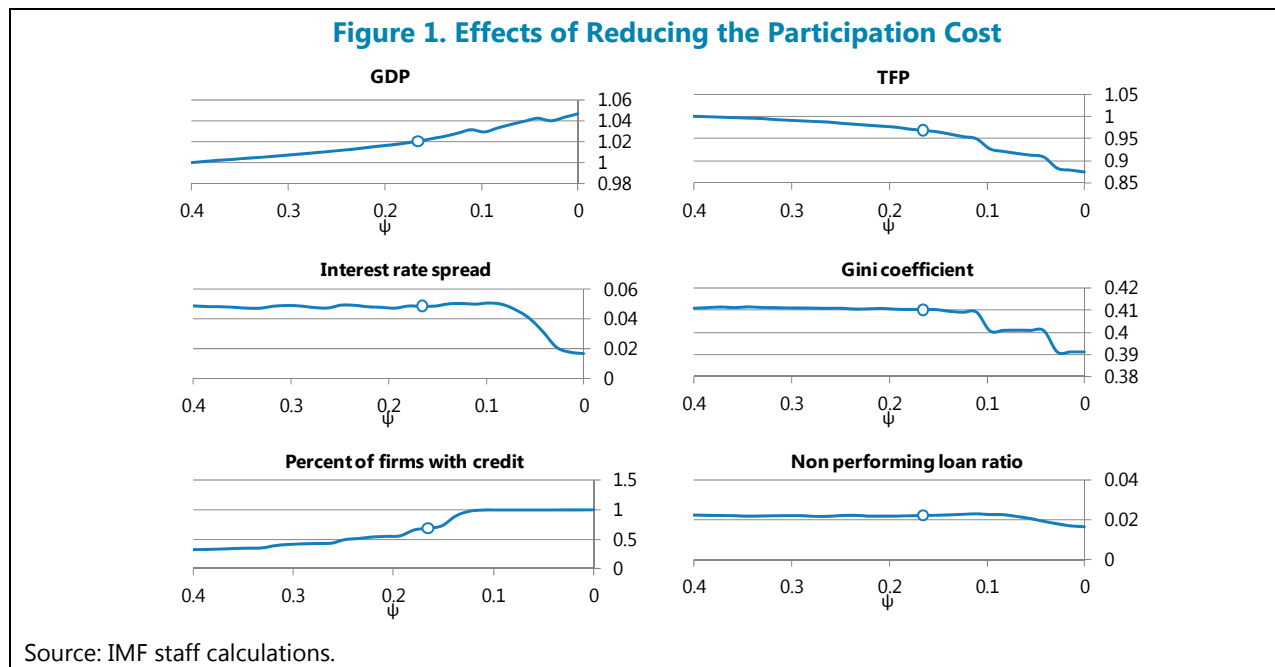
7. The impact on GDP of a decline in the financial participation cost, ψ , from its current level (0.2) to the best possible value (0) is favorable (Figure 1). A decrease in the participation cost increases GDP through its positive effect on investment. First, a lower ψ enables more firms to have access to credit, leading to more capital invested in production. Second, fewer funds are wasted in unproductive contract negotiation, allowing more capital for investment. However, average factor productivity (AFP) declines as the participation cost, which is fixed, has a higher weight in the income of small firms (which are less productive). As these previously excluded firms enter the financial sector they push down the economy-wide AFP.

8. The interest rate spread and NPL ratio are very stable when financial participation cost is high, but they eventually decrease as ψ approaches zero. This is because a decrease in ψ has two countervailing effects on interest rates in the model. First, it has a wealth effect—entrepreneurs become richer (as they need to pay less to get credit), and tend to deleverage, which results in a lower average interest rate spread and NPL ratio. Second, a smaller ψ enables some severely wealth-constrained workers to become entrepreneurs. These entrepreneurs choose a very high leverage ratio, driving the average interest rate spread up. Since the borrowing constraints are tight (high λ) in India, the first effect dominates the second effect.

9. As financial inclusion increases, income inequality decreases. A decrease in ψ is disproportionately more beneficial for constrained workers and entrepreneurs without credit. With lower

² These examples are illustrative, as the calibration for the financial inclusion process is chosen arbitrarily. It may well be possible to increase λ beyond 3 in a shorter period of time compared to that necessary to achieve other changes, with greater positive effects on the Gini coefficient. Moreover, as many reforms are implemented on various fronts contemporaneously they are likely to affect the frictions in unison with additive effects.

ψ , relatively poorer individuals earn a higher income (also there is an increase in the percent of firms with credit), and the Gini coefficient decreases.



Relaxing Collateral Constraints

10. Relaxing borrowing constraints by varying λ from its current level of 2.2 to 3 has a large positive effect (Figure 2).³ The increase in aggregate GDP is greater than in the participation costs simulation. This is due to India's high savings rate—the decline in the collateral requirements unlocks financial resources, leading to a significant increase in GDP. Indeed, this suggests that credit constraints are one of the major obstacles to financial development in India. As λ declines, AFP increases, implying more efficient resource allocation across firms.⁴

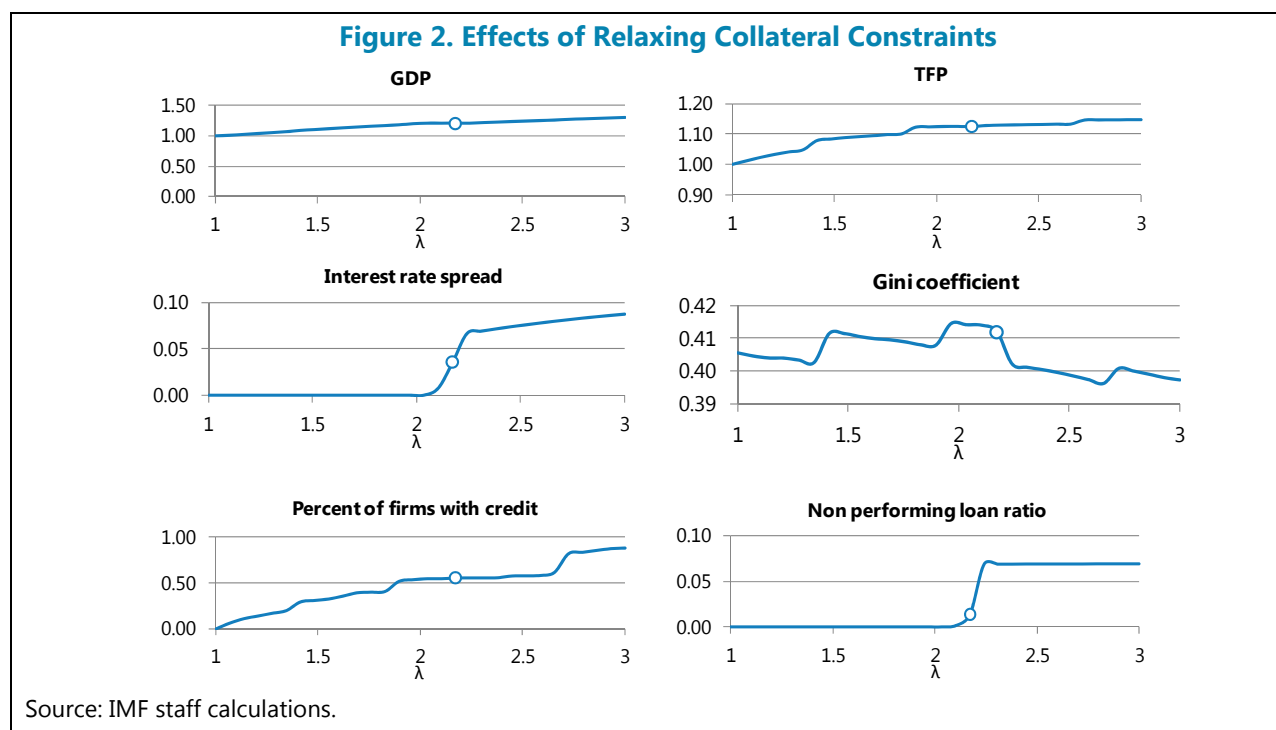
11. The interest rate spread and NPLs increase with higher λ . As λ increases above a threshold, agents leverage more, the share of non-performing loans and the interest rate spread start increasing. This occurs as a relaxation of collateral constraints opens the door for small new entrants who tend to be more leveraged.

12. Relaxing collateral constraints first pushes up inequality and then decreases it, consistent with the Kuznets' hypothesis. When λ increases from low levels, talented entrepreneurs leverage more and increase their profits, driving up the Gini coefficient. However, as λ becomes larger, the sharp

³ A value of 3 for λ represents the level of collateral as percent of loan observed on average in advanced economies

⁴ A relaxation of borrowing constraints benefits talented entrepreneurs more as it is profitable for them to operate at a larger scale than untalented entrepreneurs. With higher λ , all entrepreneurs borrow more, but, on average, untalented ones do not borrow as much.

increase in the interest rate shrinks entrepreneurs' profits, leading to a lower Gini coefficient. The stage in which India is now (i.e. its current value of λ) suggests that inequality should be declining with more relaxed collateral constraints.



Increasing Intermediation Efficiency

13. In Figure 3, the financial intermediation cost, χ , is reduced (from its current level of 0.35 to 0). When χ decreases, lending rates decline, output increases but less so compared to the case where λ is lowered. At higher levels of χ , better intermediation efficiency only benefits the highly-leveraged firms which are few in number (due to the presence of high participation costs and tight borrowing constraints). As χ decreases further TFP increases because the lower intermediation cost facilitates the allocation of capital to more efficient entrepreneurs.

14. The interest rate spread increases initially for lower levels of χ and decreases sharply as χ approaches zero, displaying an inverted V shape. Two opposing forces are in operation here. First, the decline in the cost of borrowing due to a more efficient intermediation induces enterprises to leverage more, pushing up NPLs. This also increases the endogenous interest rate spread. Second, the decline in χ decreases the interest spread directly through its effect on lending rates. The Gini coefficient increases as χ is reduced. This occurs as more efficient intermediation disproportionately benefits a small number of highly leveraged firms who are already in the financial system and have higher incomes. In fact, the percent of firms with credit remain unchanged.

15. These simulations enable the identification of the most binding financial constraint. Table 1 shows a comparison of changes in GDP, AFP and the Gini coefficient when financial inclusion is increased along different dimensions. The main finding is that relaxing constraints on collateral appears

to offer the greatest benefits in terms of Indian output and productivity. Yet, the effect on inequality is lower compared to the case when the participation cost is reduced. In fact, entrepreneurs who are already included in the financial system benefit more from the reduction in collateral requirements and less so from a reduction in the fixed participation cost which is a relatively lower share of their income. The latter, however, benefits potential new entrepreneurs more which in turn leads to decreasing inequality. Nevertheless, the “poor” may still be better off in absolute terms (albeit not relative to the “rich”) under the lower collateral requirements scenario. Not surprisingly, increasing intermediation efficiency does not boost GDP significantly, as it only benefits small number of highly leveraged firms.

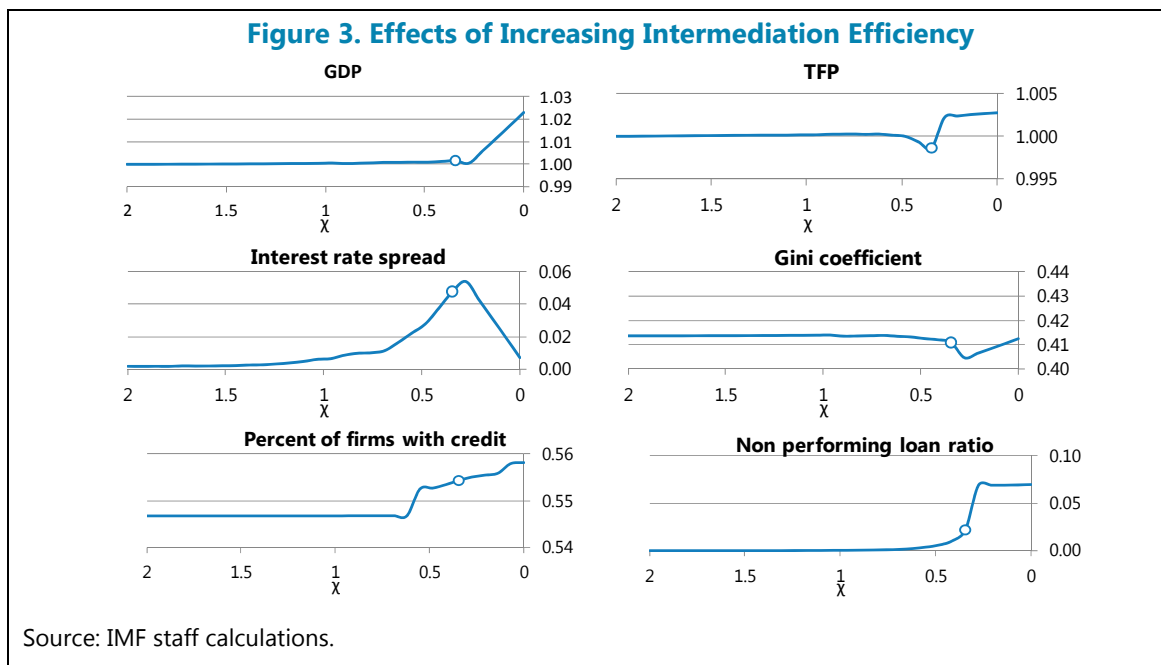


Table 1. Comparative Statistics, 2005 versus 2009

	Part. Cost ψ			Borr. Constr. λ			Intermed. Cost X		
	GDP	Gini	Average Productivity	GDP	Gini	Average Productivity	GDP	Gini	Average Productivity
India 2005	3.9	-4.8	-12.0	8.5	-2.7	3.1	1.6	0.3	0.4
India 2009	2.8	-4.7	-9.8	7.4	-3.6	2.0	2.2	0.4	0.4

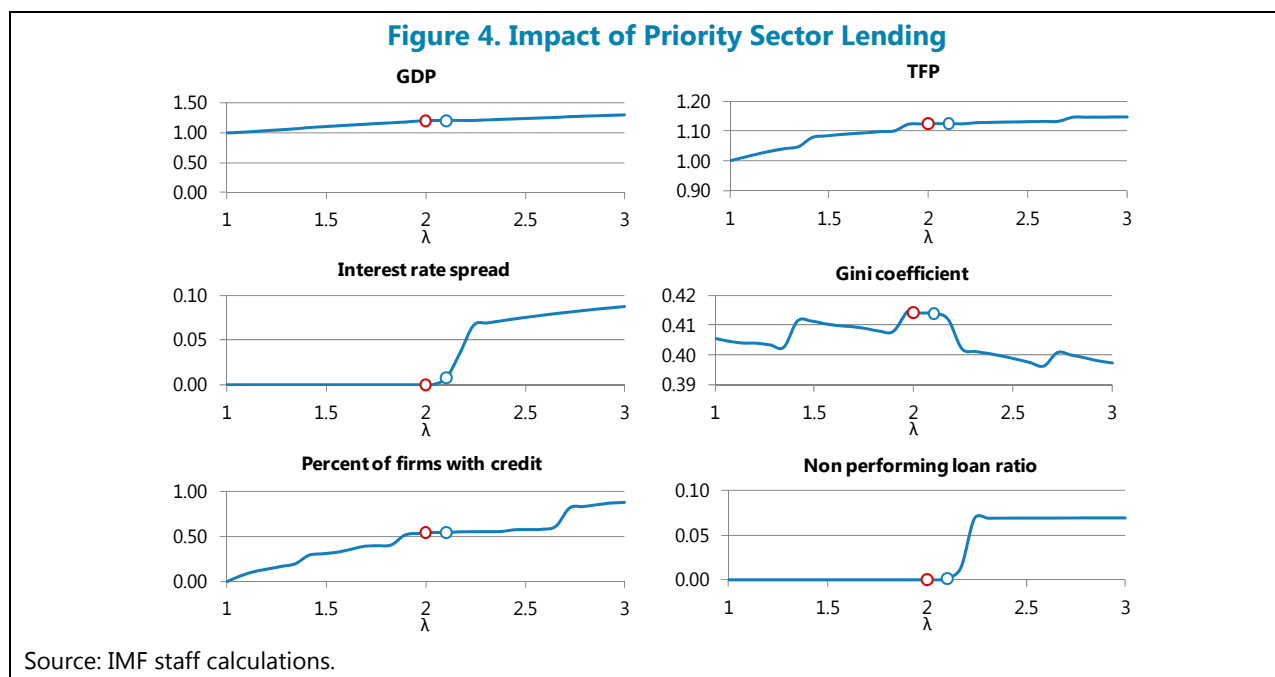
Source: IMF staff calculations.

Priority Sector Lending Viewed Through the Lens of the Model

16. The model is next used to perform counterfactual policy analysis to evaluate priority sector lending (PSL) in India. Specifically, the model is calibrated with no PSL by changing the collateral constraint (decrease λ to about 2 from its current value 2.2) such that the credit is reduced by

about 20 percent, holding other parameters fixed.⁵ In Figure 4, red dots represent the “no PSL” scenario, and the blue dots represent a regime with PSL.

17. PSL has had a large impact on financial inclusion by boosting enterprises’ access to credit, but has led to a slight increase in NPLs. As more firms have borrowed from financial institutions or have increased their borrowing, they have invested more, increasing output and productivity in India. The impact on inequality has been also favorable. However, a side effect of the policy has been increasing spreads and NPLs in line with the discussion above. Low NPLs are not necessarily welcome as they may be a reflection of limited lending. The entry of new entrepreneurs could however still point to the need for close monitoring of NPLs and possibly consideration of mitigating macroprudential measures.



Conclusions

18. Different financial inclusion strategies have varied effects on the macroeconomy, inequality and financial stability, and there are tradeoffs among these aspects. The impact of relaxing collateral constraints on output and productivity is the largest, but decreasing participation costs is the most effective in reducing income inequality in India. At this stage, increasing intermediation efficiency does not appear to lead to a particularly strong effect as collateral constraints and participation costs are more binding financial sector frictions in the case of India. Greater intermediation efficiency would be enjoyed only (or disproportionately more) by entrepreneurs that are already included in the financial system, and would not have a sizeable impact on inequality.

⁵ Using past policy changes to PSL in 2000, a number of papers (Banerjee and Duflo (2014), and Kapoor, Ranjan, Raychaudhuri (2012)) estimate that the impact of PSL on credit is about 20 percent. The impact of PSL on lending costs or access are estimated to be negligible, therefore we focus here on collateral constraints.

19. Priority sector lending appears to be effective in boosting financial inclusion and benefiting the poor, but there are some unintended side effects. The impact of the policy on output, productivity and inequality has been favorable and significant. In that sense, relatively poor individuals have benefited the most from PSL. However, the impact on financial stability may need to be closely monitored.

Box 1. India's Efforts to Enhance Financial Inclusion

India has traditionally placed considerable emphasis on financial inclusion, and many different initiatives have been tried over the years. The government has invested much effort and resources into reducing constraints to access to financial services for small and medium-sized enterprises as well as low-income households. These include:

- Expanding the access by universal basic bank coverage. In 2005, the RBI advised banks to make available basic bank accounts which were no-frills accounts with low minimum balances- services include deposit taking and cash withdrawal and receipt/credit of money through electronic payment channels or checks. In 2006, the RBI- with the objective of ensuring greater financial inclusion- enabled banks to use the services of NGOs and other organization as intermediaries in providing financial services through use of "Business Facilitator and Business Correspondent Model".
- More recently, in April 2014, new bank licenses were granted (to two financial institutions) by including financial inclusion as one of the criteria. Also in order to promote inclusion among low income households, Know Your Customer (KYC) norms were simplified.
- The RBI issued draft regulations on payments banks (2014). Payments banks will provide a limited range of products (accept deposits, facilitate remittances), and will have a widespread network of access points to remote areas (own branches/business correspondents).
- The authorities announced the Prime Minister's Jan Dhan Yojana (2014). Pillars include universal access to banking facilities with at least one account for every household, and include insurance cover, and RuPay Debit card. The authorities eventually plan to channel government benefits using the Direct Benefits Transfer scheme. As of mid-January 2015, around 115 million accounts have been opened under this scheme.