Corporate Investment in India

Lack of Investment Opportunities or Lack of Funds?

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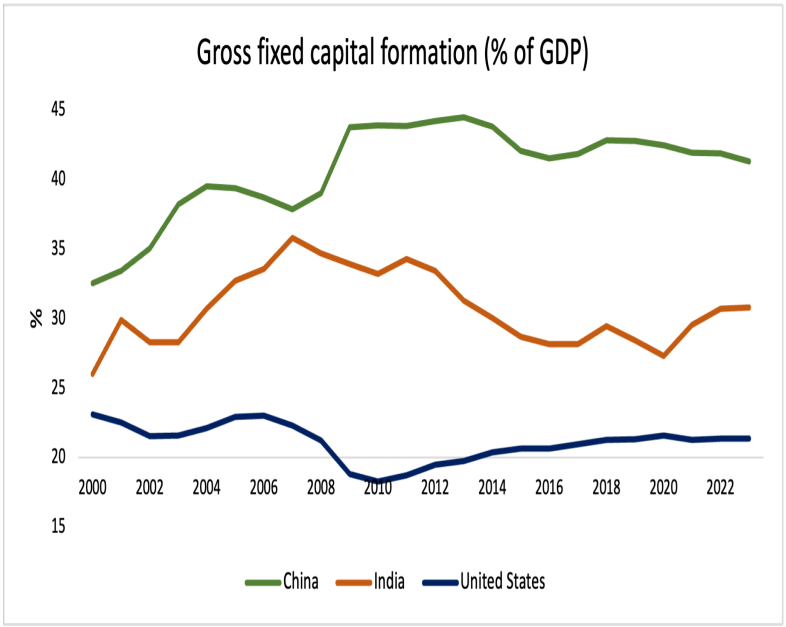
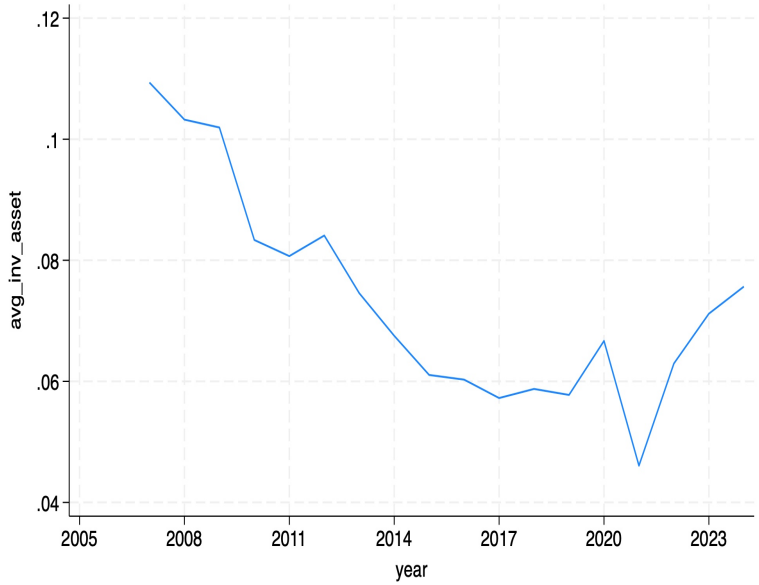
India's Economic Ambitions

- Can we become an upper-middle-income country by 2050?
- 4–5$\times$ increase in per capita income needed
- GDP growth of 6–8% per annum required
- Huge private sector investment is necessary

Investment Trends: Comparative View



Private sector investment across countries.



Investment-to-Asset Ratio for Indian Firms over time.

What Drives Private Investment

- Two fundamental drivers:
  - Investment opportunity set
  - Access to finance

- Why and how much financial constraint do Indian firms face?
  - Why?
    - Limited commitment
    - Asymmetric information
    - Weak institutions and enforcements
  - Set of reforms aimed at minimizing these constraints:
    - NPA cleaning up, Bank capitalization.
    - Bankruptcy reform.
    - Industrial organization of banking.

Empirical Challenge

- How do you measure investment opportunity?
  - Non-trivial task: Tobin's Q (market value to replacement value of asset) is a widely used measure.
  - Key idea: if Q is high, assets are valued more inside the firm than outside.

- How to measure financial constraints?
  - Key idea: how much friction does a firm face in raising external capital
  - Typically guided by economic intuition and institutional setting: smaller firms, younger firms, unlisted firms

A simple empirical approach

- How sensitive are corporate investments to:
  - measures of investment opportunity, and
  - dependence on internal funds.

$$\frac{I_{it}}{A_{i,t-1}} = \alpha_i + year_t + \alpha Q_{i,t-1} + \beta \frac{CF_{i,t}}{A_{i,t-1}} + \epsilon_{it}$$

- I_{it}: investment made by firm 'i' in year 't', scaled by lagged asset value $A_{i,t-1}$.
- Q_{it}: market-to-book ratio of assets, a measure of investment opportunity.
- CF_{it}: internal cashflows of firm, a measure of dependence on internal funds.

Sample and Data

- CMIE Prowess Dataset of Indian Firms
- Annual frequency: 2006-2024
- Exclude financial firms
- Main sample: about 2,000 listed firms with over 16,000 firm-year observations

Table: Summary Statistics - Listed Firms

	N	Mean	SD	p25	Median	p75	p90
CashFlow/ Asset	19,821	0.07	0.11	0.01	0.07	0.13	0.19
Equity/ Asset	22,486	0.47	0.22	0.30	0.45	0.63	0.78
Investment/ Asset	17,862	0.07	0.08	0.01	0.04	0.09	0.17
Collateral/ Asset	22,422	0.31	0.19	0.15	0.29	0.44	0.58
Q	22,486	1.64	1.29	0.89	1.15	1.84	3.28
BankBorrowing	18,272	2,069.19	3,011.80	35.80	474.75	2,708.20	8,743.10
NBFIborrowing	18,272	17.47	44.54	0.00	0.00	0.00	142.00
MarketBorrowing	18,272	110.94	266.41	0.00	0.00	0.00	846.40
BankBorrowing/totborrowing	17,117	0.60	0.39	0.23	0.68	0.96	1.06
NBFIborrowing/totborrowing	17,117	0.03	0.10	0.00	0.00	0.00	0.09
MarketBorrowing/totborrowing	17,117	0.06	0.16	0.00	0.00	0.00	0.21

Note: Borrowing-related variables are summarized for post-2010 observations. Sample of all listed firms covered in Prowess database. Ratio variables are winsorized at 2.5% from both tails.

Base Regression Model

Table: Investment-Q and Cash Flow Regression

	Investment/Asset		
	(1)	(2)	(3)
Lagged Q	0.1994***	0.1920***	0.1921***
	(0.0168)	(0.0169)	(0.0171)
Internal CashFlow		0.0592***	0.0572***
		(0.0121)	(0.0121)
Log(Assets)			-0.3404***
			(0.0522)
Firm Fixed Effects	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes
Sample	Listed Firms	Listed Firms	Listed Firms
Nobs	16,898	16,612	16,612
Adjusted R-squared	0.2541	0.2551	0.2590

standard errors in parentheses
* $p < .10$, ** $p < .05$, *** $p < .01$

All variables standardized to mean=0,sd=1

Interpretation of the Evidence

- Reasonable variation across investment opportunity set.
  - Investment-Q sensitivity about half of U.S. estimates (Fazzari et al. (1988))
- Strong financial constraints in India.
  - Need more external financing (bank debt, bonds) for investments.

Variation Across Access to Equity Market

Table: Investment-Listed and Unlisted Firms

	Investment/Asset	
	(1)	(2)
Listed Firm	0.1818***	0.1749***
	(0.0423)	(0.0421)
Internal CashFlow	0.0536***	0.0520***
	(0.0088)	(0.0089)
Listed Firm * Internal CashFlow	0.0111	0.0086
	(0.0143)	(0.0144)
Log(Assets)	-0.5708***	-0.5952***
	(0.0316)	(0.0319)
Firm Fixed Effects	Yes	Yes
Year Fixed Effects	Yes	Yes
Industry-Year Fixed Effects	No	Yes
Sample	Full Sample	Full Sample
Nobs	37,920	37,824
Adjusted R-squared	0.2807	0.2925

standard errors in parentheses
* $p < .10$, ** $p < .05$, *** $p < .01$

Variation Across Firm Age

Table: Investment-Firm Age

	Investment/Asset	
	(1)	(2)
Internal CashFlow	0.0772***	0.0927***
	(0.0130)	(0.0248)
Internal CashFlow * Firm Age	-0.0007**	-0.0011**
	(0.0003)	(0.0005)
Log(Assets)	-0.5518***	-0.3393***
	(0.0313)	(0.0523)
Lagged Q		0.1932***
		(0.0170)
Firm Fixed Effects	Yes	Yes
Year Fixed Effects	Yes	Yes
Sample	Full Sample	Listed Firms
Nobs	37,920	16,612
Adjusted R-squared	0.2803	0.2592

standard errors in parentheses
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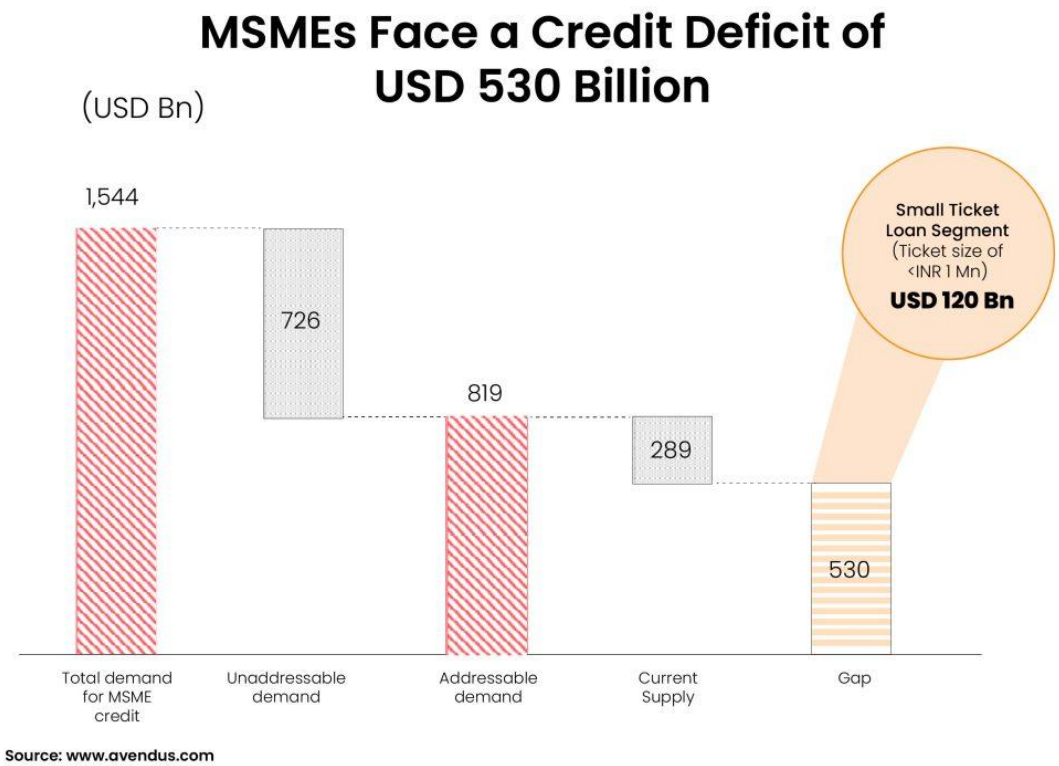
Interpretation of the Evidence

- Access to equity market does not seem to matter much.
- Younger firms (tend to be smaller) face greater constraint.
- Credit constraints, especially by smaller firms, seem to matter more.

India's Credit Problem



- Over 80% of MSME not served by formal credit institutions.
- Credit gap of over $500 billion.

What happened since reforms?

- Key idea behind reforms:
  - Improve project selection and recovery
  - Improve contract enforcement
  - Risk-sensitive decisions
- Difficult to isolate the effect of specific reforms (e.g., NPA cleanup vs. Bankruptcy Code)
- We look at pre- and post-2015 as a simple proxy for these set of reforms

Investment Drivers After Reforms

Table: Investment-NPA Reform

	Investment/Asset	
	(1)	(2)
Lagged Q	0.1469***	0.1388***
	(0.0286)	(0.0285)
postNPA * Lagged Q	0.0524*	0.0678**
	(0.0269)	(0.0276)
Internal CashFlow	0.0574***	0.0951***
	(0.0121)	(0.0202)
Log(Assets)	-0.3569***	-0.3511***
	(0.0531)	(0.0531)
postNPA * Internal CashFlow		-0.0596**
		(0.0232)
Firm Fixed Effects	Yes	Yes
Year Fixed Effects	Yes	Yes
Sample	Listed Firms	Listed Firms
Nobs	16,612	16,612
Adjusted R-squared	0.2593	0.2598

standard errors in parentheses
* $p < .10$, ** $p < .05$, *** $p < .01$

Interpretation of the Evidence

- Improvement after the series of reforms.
  - allocative efficiency: want higher sensitivity of investment to Q
  - constraint relaxation: want lower sensitivity of investment to internal cashflows
- Conjecture: quality of investment increased, not the quantity.

Interpretation of the Evidence

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- Next series of tests: focus on sources of financing

Table: Investment Regression-Bank Dependence

	Investment/Asset		
	(1)	(2)	(3)
Lagged Q	0.1926***	0.1923***	0.1961***
	(0.0170)	(0.0170)	(0.0172)
Internal CashFlow	0.0512**	0.0573***	0.1380***
	(0.0205)	(0.0121)	(0.0374)
Bank Borrowing	-0.0219	-0.0341	-0.0384
	(0.0233)	(0.0408)	(0.0411)
Bank Borrowing * Internal CashFlow	0.0086		-0.0652
	(0.0236)		(0.0433)
Log(Assets)	-0.3409***	-0.3412***	-0.3343***
	(0.0522)	(0.0522)	(0.0525)
postNPA * Bank Borrowing		0.0167	0.0228
		(0.0429)	(0.0431)
postNPA * Internal CashFlow			-0.1207***
			(0.0426)
postNPA * Bank Borrowing * Internal CashFlow			0.0988**
			(0.0502)
Firm Fixed Effects	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes
Sample	Listed Firms	Listed Firms	Listed Firms
Nobs	16,612	16,612	16,612
Adjusted R-squared	0.2590	0.2590	0.2595

Sources of Non-Bank Credit

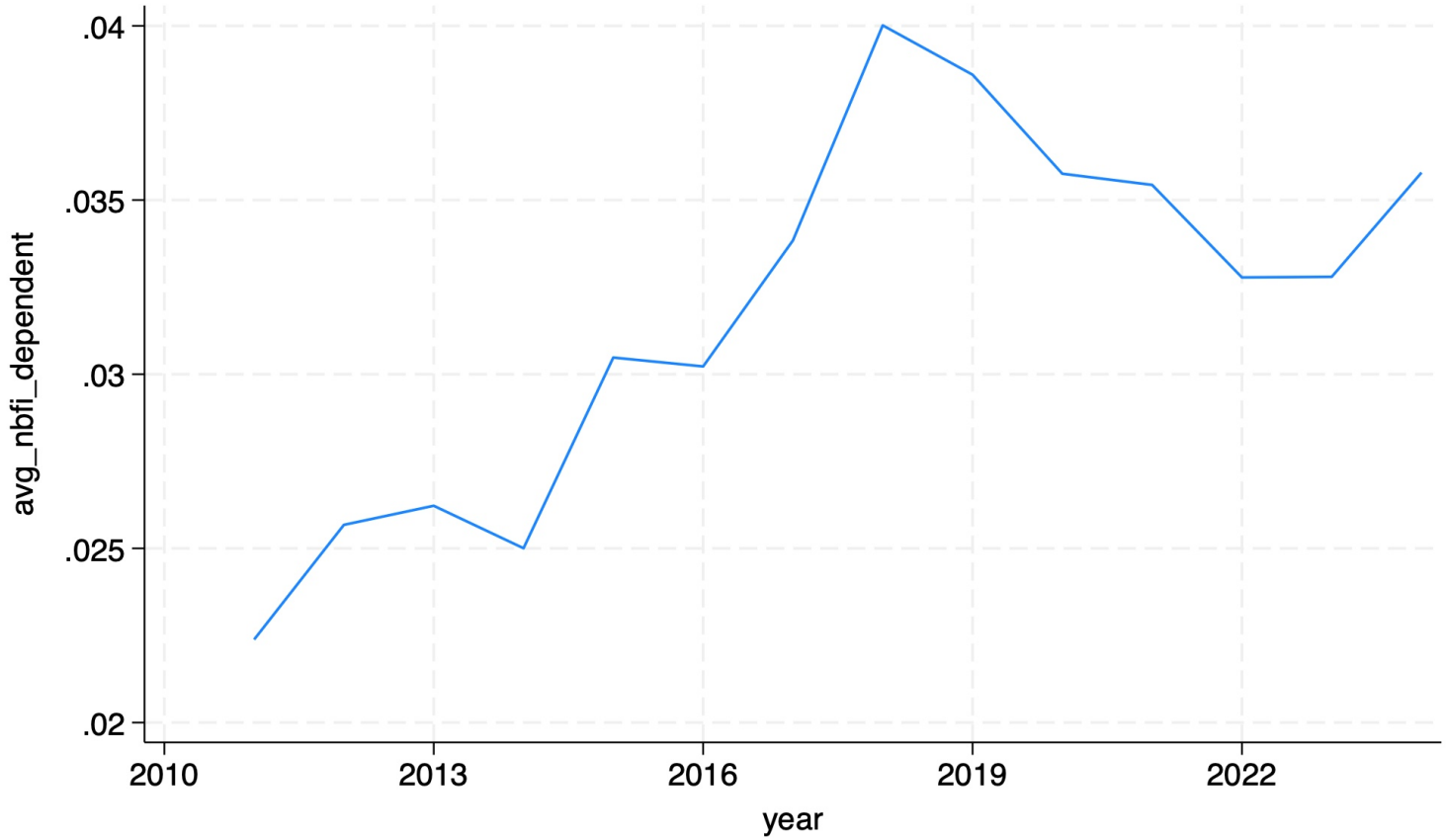

Figure: Borrowing from NBFI

Not a Free Lunch: Disruption in NBFIs

	Investment/Asset		
	(1)	(2)	(3)
Lagged Q	0.1926***	0.1927***	0.1924***
	(0.0170)	(0.0171)	(0.0170)
Internal CashFlow	0.0576***	0.0559***	0.0573***
	(0.0121)	(0.0160)	(0.0121)
Log(Assets)	-0.3428***	-0.3427***	-0.3443***
	(0.0522)	(0.0528)	(0.0523)
NBFI Dummy	0.0773**	0.0782**	
	(0.0338)	(0.0342)	
NBFI Dummy * postILFS	-0.0686	-0.0695	
	(0.0475)	(0.0476)	
NBFI Dummy * Internal CashFlow		0.0088	
		(0.0422)	
postILFS * Internal CashFlow		-0.0037	
		(0.0224)	
NBFI Dummy * postILFS * Internal CashFlow		0.0227	
		(0.0603)	
NBFI Borrowing			0.0165**
			(0.0075)
postILFS * NBFI Borrowing			-0.0199**
			(0.0099)
Firm Fixed Effects	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes
Sample	Listed Firms	Listed Firms	Listed Firms
Nobs	16,612	16,612	16,612
Adjusted R-squared	0.2592	0.2591	0.2593

Concluding Remarks

- A simple (not perfect) way to understand how firms invest and where they face frictions

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- A simple (not perfect) way to understand how firms invest and where they face frictions
- Improvement after the series of reforms.
  - allocative efficiency: firms seems to be investing for the right reasons (recall the investment boom of early 2000)
  - constraint relaxation: for larger firms with access to non-bank credit
- Conjecture: quality of investment increased, not the quantity.
- Natural question: how to strike a balance?