

Anatomy of a Liquidity Shock on Non-banks

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5-7 July 2023
CEBRA Annual Meetings

*Disclaimer: Views are personal and do not represent the viewpoint of Reserve Bank of India (RBI) or CAFRAL.

Motivation

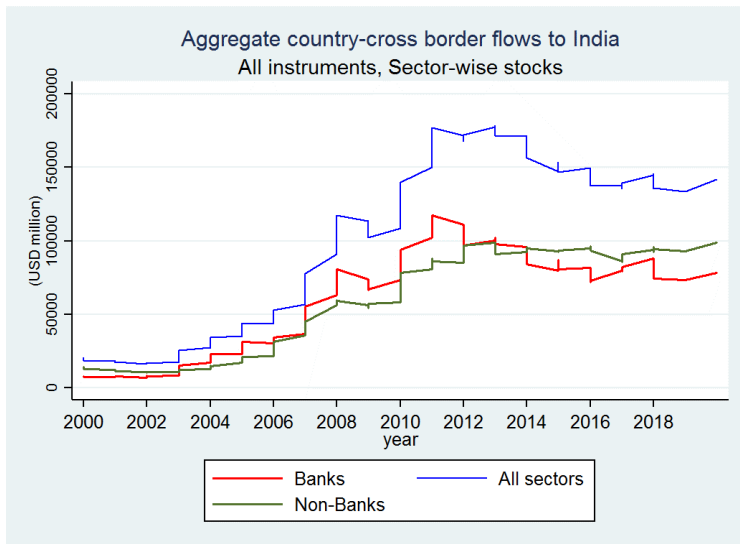
- ▶ Maturity mismatch is inherent in financial institutions
 - ▶ Banks: Inherent Asset-Liability Maturity (ALM) mismatches → deposit insurance, LOLR → Moral hazard concerns that are then managed through regulation (Farhi and Tirole, 2020)
 - ▶ NBFCs: Similar ALM mismatches, but lighter regulation vis-a-vis banks with no deposit insurance and LOLR
- ▶ We know about the effects of traditional banking shocks, but less about the impact of shocks on non-banks.

Why do we care?

Non-banks contribute to:

1. Facilitates MP transmission to fin intermediaries
 - ▶ Through stable interest rate spreads (Acharya, 2020)
2. Financial stability
 - ▶ Increasing credit share in total financial assets in India & globally (Agarwal, 2023)
 - ▶ Attracting more foreign investors through cross-border flows (Sinha, 2023)

Cross-border flows in India



(Sinha, 2023)

This Paper

Setting: In September 2018, a large NBFC defaults on short-term debt of a financial institution

- ▶ Mutual funds (MFs) started facing redemption pressure
- ▶ → Mutual funds, comprising 60% of the commercial paper (CP) market for NBFCs start pulling out
- ▶ → NBFCs that rely on short-term funding from the CP market are unable to secure short-term funding

Research Questions

We study effects of a **Liquidity Shock** on:

- ▶ Short-term funding:
 - ▶ Commercial Paper (CP) funding (first order effect)
 - ▶ Bank/bond market funding (second order effect)
- ▶ Asset-side
 - ▶ Impact on Credit & investment
- ▶ Spillover to other segments:
 - ▶ **Contagion effects**: What happens to the traditional banking sector lenders?
 - ▶ **Real Effects**: What happens to the borrowers of the NBFCs at firm-level?

Identification: Exploit ex-ante heterogeneity in the < 1 -year liquidity exposure that made certain NBFCs more susceptible to the “shock”.

Key insights

1. Post-shock, CP funding ↓ 14.5 pp for NBFCs with higher ex-ante exposure.
 - ▶ Attributable majorly to fall in CPs subscribed by MFs
 - ▶ Larger (& more exposed) NBFCs suffer more; no effect of operating efficiency.
2. High-exposure NBFCs cannot make up for CP funding declines by borrowing from banks and debentures
3. NBFC-lender data for a subset (57 NBFCs) shows that NBFCs ↑ borrowing from banks only if they are 'healthy'.
4. Credit ↓ (retail, industry, services), no effect on investments
5. High-exposure NBFCs pass on their credit constraints to borrowers in the short-run.

Related literature

1. Mechanism of shocks:

▶ Short-term effects:

- ▶ lending (Ivashina and Scharfstein (2010), Puri, Rocholl and Steffen (2011))
- ▶ investments (Campello, Garaham, and Harvey, 2010)
- ▶ consumption (Damar, Gropp and Mordel, 2014)

▶ Long-term effects:

- ▶ Gropp, Ongena, Rocholl, and Saadi (2022)
- ▶ Mukherjee and Proebsting (2016): crises clean the market for corporate control by intensify productivity-enhancing M&A activity.

2. Cleansing effects:

- ▶ Allocative efficiency increase post bank runs (Schumacher, 1998)
- ▶ But ... can decrease in the presence of safety nets (Acharya, Das, Kulkarni, Mishra, and Prabhala, 2022; Penas and Unal, 2004; Iyer et al., 2019)
- ▶ Bank-Non-bank relationships (Agarwal, 2023)

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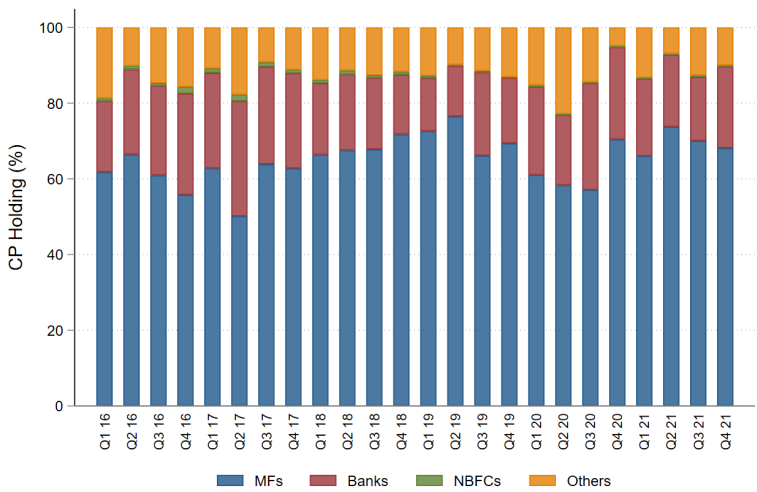
Institutional Details

NBFCs in India

- ▶ The non-bank sector holds total financial assets worth nearly ₹38 trillion (approx 0.4 trillion USD) in March 2022:
 - ▶ Credit to GDP ratio of the sector grew from 8.6 % in 2013 to 12.3 % in 2022
 - ▶ NBFC share in bank credit rose from 15 % in 2013 to 25 % in 2022
- ▶ Based on liability structure, there are deposit-taking NBFCs (NBFCs-D) and non-deposit taking NBFCs (NBFCs-ND). As of July 2022, 9640 NBFCs were registered with RBI 2022, of which 415 were NBFCs-ND-SI, 49 were NBFCs-D and the rest were NBFCs-ND
- ▶ In terms of activities:
 - ▶ Asset Finance Companies (AFC)
 - ▶ Investment Companies (IC)
 - ▶ Loan Companies (LC)
 - ▶ Infrastructure Finance Companies (IFC)
 - ▶ Core Investment Companies (CIC)
 - ▶ Micro Finance Institutions (NBFC-MFI)
 - ▶ Infrastructure Debt Funds (NBFC-IDF)

} NBFC-Investment and
Credit Company (NBFC-ICC)

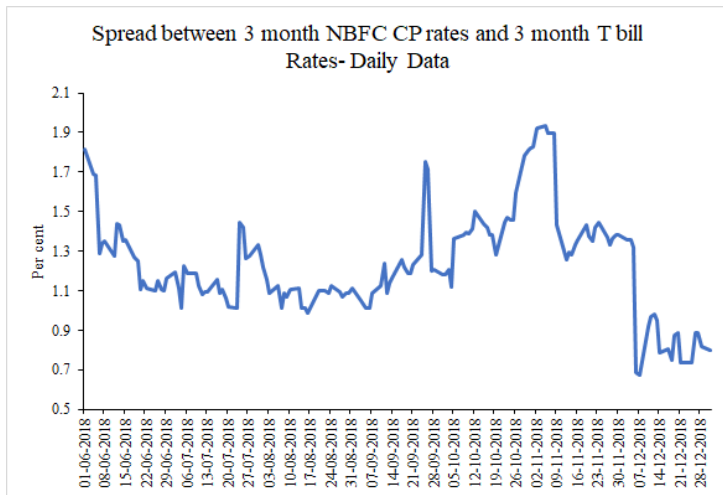
Share of NBFCs' CP holding by type of financial institution



The Liquidity Shock

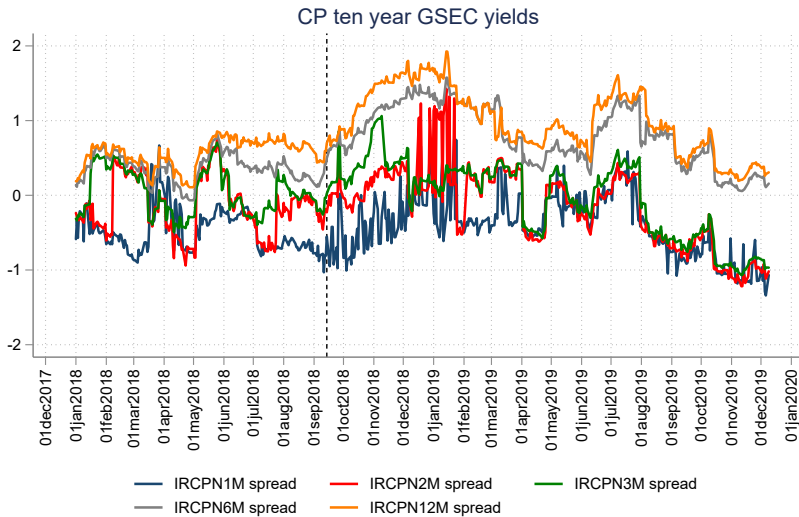
- ▶ In September 2018, a large NBFC defaulted on short-term loan. It had a debt of Rs 91000 crores (of which ₹Rs 57000 crore was lent by public sector banks).
- ▶ Started when the subsidiaries of the conglomerate could not repay short-term loans, which raised concerns among investors. Rating agencies downgraded the company and its subsidiaries to junk status, causing a sell-off in the market.
- ▶ Facing redemption pressure, mutual funds, comprising 60% of the commercial paper (CP) market for NBFCs, pulled out.
- ▶ NBFCs faced large hike in spreads– higher borrowing costs. Subsequently, a few other NBFCs defaulted on their borrowings.

CP spreads increased



Cost of borrowing short-term went up

Term risk premia instability



Data

Entity-level Supervisory Datasets

We utilise a unique database:

- ▶ Supervisory reporting of entity-level info on 332 non-bank financial companies (NBFCs) in India- we restrict our analysis to ICCs
- ▶ We collate data from COSMOS, Business Objects and XBRL platform
- ▶ Quarterly, pre (June-September 2018) & post period (December 2018- March 2019) of the 'shock'

Matched with:

- ▶ Supervisory balance-sheet info of scheduled commercial banks (lenders)
- ▶ Matched with individual (top 20) borrowers

Empirical Setup

Empirical Design

- ▶ Exploit the ex-ante liquidity mismatch for NBFC i in the shortest tenure bucket (less than 1 year), which indicates immediate funding requirement (includes current portion for the repayment of term loans to banks and CP obligations to be rolled over or repaid).

$$\text{Ex-Ante Exposure}_i = \frac{\text{Contractual Inflows} - \text{Contractual Outflows}}{\text{Contractual Outflows}}$$

- ▶ Firms with below-median short-term liquidity denote higher ex-ante exposure and take a value of '1', while firms with above-median liquidity indicate lower ex-ante exposure and take a value of '0' as of June 2018.
- ▶ Intuition: Exploit the ex-ante exposure to rollover risk that materializes during the liquidity shock.

Correlates of Short-term Liquidity

$$\Delta \text{Ex-Ante Exposure}_i = \alpha + \mathcal{X}_i + \epsilon_i$$

	(1)	(2)	(3)
		Ex-ante Exposure	
Operating Expense	-0.089 (0.071)		
Cash Ratio		0.127 (0.157)	
NPA Ratio			-0.000 (0.001)
R ²	0.006	0.003	0.000
N	254	253	223

Standard errors in parentheses; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Empirical Specification

$$\Delta Y_i = \alpha + \beta \times \text{Ex-Ante Exposure}_i + X_i + \epsilon_i$$

- ▶ for NBFC i
- ▶ For the shock event, pre-period is June 2018 and September 2018 and the post-period is December 2018 and March 2019.
- ▶ Dependent variable ΔY_i is the change in the outcome of interest-borrowing/lending- based on the average balance sheet data for the pre- and post-period.
- ▶ Controls included are non-performing assets (NPA) ratio, operating expense ratio, and cash ratio in the pre-period (June 2018).
- ▶ Coefficient of interest, β , measures the effect of the shock on the relevant outcome variable for NBFCs with high ex-ante exposure (relative to low-exposure NBFCs).

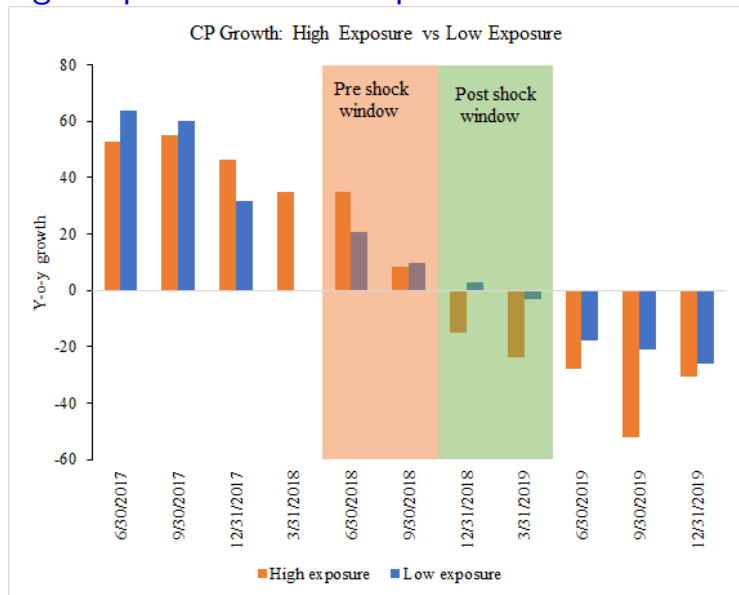
Impact on NBFCs' CP Growth

Dependent variable:	(1)	(2)	(3)	(4)	(5)
	All	MF	Bank	NBFC	Other
Ex-ante Exposure	-14.507*** (4.673)	-10.618*** (4.054)	-2.237 (2.445)	-0.340 (0.766)	-3.313 (3.145)
R ²	0.030	0.021	0.003	0.001	0.004
N	318	318	318	318	318

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Standard errors clustered at firm level.

Effects concentrated in commercial paper subscribed by MFs

CP Growth: High Exposure vs Low Exposure



Placebo years (Sept 2017 to Dec 2017): No effect

Similar placebo effects for other periods

	(1)	(2)	(3)	(4)	(5)
Dependent variables:	CP growth exposure				
	All	MF	Bank	NBFC	Other
Ex-ante Exposure	-10.804 (10.526)	-1.660 (9.238)	1.380 (8.965)	1.846 (1.191)	3.128 (4.294)
R ²	0.004	0.000	0.000	0.007	0.002
N	263	263	263	263	263

Standard errors in parentheses; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Heterogeneity in Commercial Paper Growth

	(1)	(2)	(3)
Dependent variables:		CP Growth	
	Size	Provisioning ratio	OpEx ratio
Ex-ante Exposure	32.149** (13.062)	-15.146*** (4.589)	-13.892** (5.859)
Ex-ante Exposure * Variable	-5.562** (2.283)	0.785*** (0.078)	2.543 (7.943)
Variable	11.809*** (1.844)	0.035 (0.055)	-17.516** (7.023)
R ²	0.212	0.056	0.057
N	316	318	318

Larger NBFCs with worse ALM saw greater outflows

Impact on Alternate Funding Sources

	(1)	(2)	(3)	(4)
Dependent variables:		Growth in borrowing from		
	Total	CP	Debentures	Bank
Ex-ante Exposure	-58.802*** (6.173)	-14.507*** (4.673)	-30.147*** (5.797)	-46.015*** (6.031)
R ²	0.222	0.030	0.080	0.157
N	318	318	318	318

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Standard errors clustered at firm level.

Confidence crisis - Unable to tap into alternative sources of funding

Reduced lending from traditional banking system

	(1)	(2)	(3)	(4)
Dependent variables:		Growth bank borrowing		
	Term	Working cap.	Cash	OD
Ex-ante Exposure	-47.689*** (7.081)	-16.114*** (4.774)	-28.354*** (8.645)	-2.417 (3.090)
R ²	0.127	0.035	0.033	0.002
N	318	318	318	318

Standard errors in parentheses; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

NBFCs with higher exposure experienced broad-based outflows from banks

Within-firm variation in lending by Financial Institutions

- ▶ We have Financial Institution (lender) data for a subset of 57 NBFCs (all types)
- ▶ The 57 NBFCs account for 85% of total assets of the NBFC market

Heterogeneity by Bank vs Non-bank Lending to NBFCs

	(1)	(2)
Dependent variables:	Growth in borrowing.	
Ex-ante Exposure	-0.290** (0.134)	-0.359** (0.176)
Exposure * Bank	0.389*** (0.147)	0.555*** (0.203)
Bank	0.124** (0.063)	
R ²	0.018	0.415
FI-FE	N	Y
N	1064	1064

Standard errors in parentheses; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Healthy NBFCs

Below Median Gross Non-performing Asset Ratio

	(1)	(2)
Dependent variables:	Growth in borrowing	
Ex-ante Exposure	-0.621*** (0.092)	-0.498* (0.254)
Exposure * Bank	0.643*** (0.121)	0.626** (0.281)
Bank	0.055 (0.087)	
R ²	0.029	0.445
FI-FE	N	Y
N	570	570

Unhealthy NBFCs

Above Median Gross Non-performing Asset Ratio

	(1)	(2)
Dependent variables:	Growth in borrowing	
Ex-ante Exposure	0.262 (0.273)	-0.162*** (0.000)
Exposure * Bank	-0.252 (0.294)	0.228 (0.222)
Bank	0.305*** (0.108)	
R ²	0.027	0.573
FI-FE	N	Y
N	492	492

Impact on credit and investments

	(1)	(2)	(3)	(4)
Dependent variables	Credit	Growth in Investments		
		All	Long-term	Current
Ex-ante Exposure	-32.537*** (8.714)	-4.786 (9.169)	6.281 (8.806)	15.523 (18.113)
R ²	0.042	0.001	0.002	0.002
N	318	318	318	318

Standard errors in parentheses; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Sectoral Credit Impact

	(1)	(2)	(3)
Dependent variables:		Loan Growth	
	Retail	Industry	Services
Ex-ante Exposure	-29.776*** (4.839)	-15.677*** (5.919)	-20.140*** (5.813)
R ²	0.108	0.022	0.037
N	318	318	318

Standard errors in parentheses; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Larger impact on retail loans which are typically of shorter tenure. Also likely that these NBFCs had greater market share in retail lending

Effect on Firms Borrowing from High Exposure NBFCs

Khwaja-Mian Identification for firms borrowing from multiple NBFCs

	(1)	(2)
Dependent variables:	Log of firm borrowings	
Ex-ante exposure	-2.772*** (0.050)	-0.349*** (0.094)
R ²	0.159	0.883
Borrower-FE	N	Y
N	15988	14010

Standard errors in parentheses; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

High-exposure NBFCs cut credit to borrowers vis-a-vis low exposure NBFCs

Summing up

- ▶ NBFCs with higher ex-ante exposure to liquidity risk suffered more from the liquidity shock as they were unable to make up for the shortfall in short term funding requirements. Moreover, they were also not able to access alternate sources of borrowings like banks and debentures.
- ▶ Banks ringfence themselves from spillover effects and support only healthier NBFCs.
- ▶ At the sectoral level, such NBFCs cut down credit across sectors. Investments are not impacted.
- ▶ High-exposure NBFCs pass on their credit constraints to their borrowers.

Thank you!

Comments welcome: sonalikasinha@rbi.org.in