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## The growth of a shadow banking system in emerging markets: Evidence from India<sup>☆</sup>



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### A B S T R A C T

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We study the determinants of the growth of those non-deposit taking non-bank financial corporations (NBFCs) which are regarded by the Reserve Bank of India as being systemically important and have grown substantially in India over the past decade. We document that bank lending to NBFCs (i) forms a significant proportion of the NBFC liabilities; (ii) fluctuates in line with bank allocation to priority lending sectors; (iii) decreases as the banks expand in the rural areas relative to urban areas; but, (iv) is virtually non-existent for the largest state-owned bank, namely State Bank of India (SBI) and its affiliates which have significant rural branch network. Starting with the financial crisis of Fall 2008, bank lending to NBFCs experienced a permanent contraction shock related to the shift of term deposits toward SBI away from other banks. These bank-NBFC linkages are present primarily for, and affect the credit growth of, those NBFCs that do loans or asset financing but not the investment companies. Overall, the findings suggest that in contrast to the prevailing views of shadow banking in the Western economies, lending to NBFCs in India is viewed by banks as a substitute for direct lending in the non-urban areas of

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the Indian economy, but this substitution is constrained by distortions in bank deposit flows due to the perceived differential government support of different banking groups.

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## 1. Introduction

We investigate the rapid growth of the non-bank financial corporations (NBFCs) in India as a laboratory to understand incentives underlying the growth of *shadow banking* institutions in emerging markets. Our main finding is that unlike the prevailing views on shadow banking<sup>1</sup> in the Western economies, which concern desire to provide “safe” collateral for financial transactions and mitigate counterparty risk<sup>2</sup> or simply to arbitrage bank regulations such as capital requirements,<sup>3</sup> the NBFCs in India appear to be substitutes for direct lending by banks in the non-urban parts of the Indian economy. Indeed, and consistent with the prevailing views of shadow banking, NBFCs in India are also linked to the banking sector, in particular, through bank lending to NBFCs which forms a significant proportion of NBFC liabilities. We study how these bank-NBFC linkages affect NBFC credit growth, how the linkages vary across types of banks in their ownership structure (state-owned versus private in case of banks), rural bank branching network relative to urban branching, and function of the NBFC (Financing versus Investment), and finally, what impact did the financial crisis in Fall 2008 have on these linkages given the relative shift of term deposits into state-owned banks due to their stronger perceived guarantees.

Exploiting a special dataset<sup>4</sup> of individual NBFCs over the period 2006–2011 that we collected from the Reserve Bank of India (RBI), we examine the following questions.

- 1) Does bank lending to the priority sectors<sup>5</sup> influence bank lending to the NBFCs and, in turn, how does NBFC lending itself gets affected?
- 2) Does bank branch expansion in rural areas relative to urban areas influence bank lending to the NBFCs and, in turn, how does NBFC lending itself gets affected?
- 3) Do term deposits (the more stable or less fragile form of deposits) at banks influence bank lending to the NBFCs and, in turn, how does NBFC lending itself gets affected?
- 4) Did the crisis have a long-term effect on the bank lending to the NBFCs and, in turn, how did NBFC lending itself get affected?
- 5) Do these channels influence the Investment Company and Financing Company NBFCs similarly or differentially?

Our results provide four interesting properties of bank lending to NBFCs in India over the period 2006–2011.

One, bank lending to NBFCs fluctuates in line with bank allocation to priority lending sectors; and second, this lending decreases as the banks expand in the rural areas relative to urban areas but this

<sup>1</sup> We discuss the prevailing views on shadow banking in [Appendix I](#).

<sup>2</sup> See, in particular, [Claessens et al. \(2013\)](#), who survey the academic literature focused on the role of shadow banking in creating “safe” collateral to reduce counterparty risk, facilitate financial transactions, and satisfy the global demand for relatively safe assets for liquidity and hedging purposes.

<sup>3</sup> [Acharya et al. \(2013\)](#), for example, illustrate how commercial banks engaged in regulatory arbitrage of Basel capital requirements by setting up asset-backed commercial paper (ABCP) conduits, which experienced the first (shadow-banking) “run” of the financial crisis of 2007–08.

<sup>4</sup> Described in detail is [Section 3](#).

<sup>5</sup> As per the RBI definition, *priority sector* refers to those sectors of the Indian economy, which may not get timely and adequate credit in the absence of this special dispensation. Typically, these are small value loans to farmers for agriculture and allied activities, micro and small enterprises, poor people for housing, students for education and other low-income groups and weaker sections. The RBI classifies the priority sectors into the following categories: a) Agriculture; b) Micro and Small Enterprises; c) Education; d) Housing; e) Export Credit and f) Others.

relationship is virtually non-existent for the largest state-owned bank, namely the State Bank of India (SBI) and its affiliates which have significant rural branch network of their own. Third, these bank-NBFC linkages are present primarily for, and affect the credit growth of, those NBFCs that do loans or asset financing but not the investment companies (whose activities are focused on acquiring securities, and not on lending). All of these findings suggest that the banks view the NBFCs as a substitute for direct lending in the non-urban areas of the Indian economy. This view of the NBFCs is consistent with the current explanations of their recent growth in India (Duggal and Kapali, 2012; Deosthalee, 2010) which focus on NBFC's greater ability compared to banks in reaching out to small borrowers in far-flung rural areas, upcoming small- and medium-sized enterprises, enterprising self-employed service providers, mid-market corporates and emerging infrastructure developers.

Fourth, starting with the financial crisis of Fall 2008, bank lending to NBFCs experienced a permanent contraction shock related to the shift of term deposits (relative to demand deposits) toward the SBI – and then to other state-owned banks – away from other banks. Acharya and Kulkarni (2012, 2013) show empirically that this shift of deposits – and the relative out-performance – of state-owned banks during 2008 appeared to be unrelated to measures of their vulnerability to market downturns, whereas private banks experienced deposit withdrawals and shortening that were correlated to their vulnerability to market downturns. They further show that state-owned banks increased their loan advances, at cheaper rates, and especially to public sector firms and priority lending sectors. Consistent with their findings, we document that the deposit shift across bank types in Fall 2008 reduced bank lending to the NBFCs.

Overall, our findings suggest that in contrast to the prevailing views of shadow banking in the Western economies, the NBFCs in India appear to provide a completeness of credit spectrum in the economy, with banks lending to the NBFCs as a substitute for direct lending to non-urban parts of the economy. While this economic function and its financing by banks help understand the recent growth of the NBFCs, this growth and its financing by banks has been affected over time due to deposit shifts attributable to perceived government guarantees between banks with and without significant non-urban reach in their branch networks.

We organize the rest of the paper as follows. Section 2 introduces the NBFC and bank groupings we employ in the paper. Section 3 presents the datasets we employ on NBFCs and banks. Section 4 presents our primary questions of interest and the leading econometric specifications we employ. Section 5 presents the results. Section 6 concludes.

## 2. Background on the Indian non-bank financial corporations (NBFCs)

### 2.1. Indian NBFCs

India has a rather complex credit system. It consists not only of formal networks of public and private commercial banks, regional rural banks, cooperative banks, public financial institutions such as National Bank for Agricultural and Rural Development (NABARD), National Housing Bank (NHB) and Small Industries Development Bank of India (SIDBI), and NBFCs, but also of quasi-formal and informal (even illegal, but socially accepted) networks of Nidhis,<sup>6</sup> Chit Funds,<sup>7</sup> Badla Financiers,<sup>8</sup> Commodity Trade Financiers, Gold Saving Companies, Gold Loan Companies, Pawnbrokers, Plantation Companies, Money Lenders and many others. Although shadow banking systems can develop in any section of this complex credit system, because of data availability, our focus is on those non-deposit taking NBFCs which are regarded by the Reserve Bank of India (RBI) as being systemically important. We exploit a special data set given to us by the Reserve Bank of India covering these NBFCs over the period 2006–2011.

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<sup>6</sup> Companies registered under Companies Act of India and notified as Nidhi companies by the Indian Central Government under Section 620-A of Companies Act of India. They are non-bank finance companies that collect funds from and lend to its members or shareholders.

<sup>7</sup> Same as Nidhis, except that their members or shareholders are individuals only.

<sup>8</sup> Stock Trade Financiers.

**Table 1**

Comparison of Bank and Deposit Taking NBFC Deposits. This table compares the deposit taking NBFC deposits to the bank deposits for the fiscal years 2006, 2010 and 2011.

	2006	2010	2011
Number of deposit taking NBFCs	428	308	297
Bank deposits of all banks (trillions of rupees)	21.858	46.352	53.552
NBFC public deposits as percentage of bank deposits	1.05%	0.37%	0.22%

Source: Finance Ministry of the Government of India. [http://financialservices.gov.in/reports/Reports%20\\_NBFCs.pdf](http://financialservices.gov.in/reports/Reports%20_NBFCs.pdf).

Although some forms of non-bank money lending institutions had existed in India even before the Indian independence of 1947, the emergence of Indian NBFCs as we know them can be traced back to the 1950s. For example, one of the earliest after independence Indian NBFCs, Sundaram Finance, was incorporated in 1954 with the objective of financing the purchase of commercial vehicles and passenger cars.<sup>9</sup> Since most, if not all, of the early Indian NBFCs mobilized deposits to fund their financing, they were shadow banks in the sense we described above.

Emergence of some fly-by-night NBFCs in this early period (Deosthalee, 2010) created concerns among the regulators and the NBFC regulation in India began in 1963 with the insertion of a new chapter, IIIB, in the RBI Act, 1934 to enable the central bank to effectively supervise, regulate and control these institutions (Nisar and Aziz, 2004). The initial focus was on moderating the deposit mobilization of the NBFCs to safeguard depositors' interest and ensure healthy functioning of the NBFC sector. Since then, many attempts have been made to enhance the extant regulatory framework and several amendments to the RBI Act, 1934 had been made until 1998 (see, Deosthalee, 2010; Nisar and Aziz, 2004 and the references therein for detailed historical accounts).

In 1998, the RBI introduced an entirely new set of NBFC regulations and supervision (announced in January and further amended in December). In this new set of regulations, the NBFCs were broadly classified into three categories:

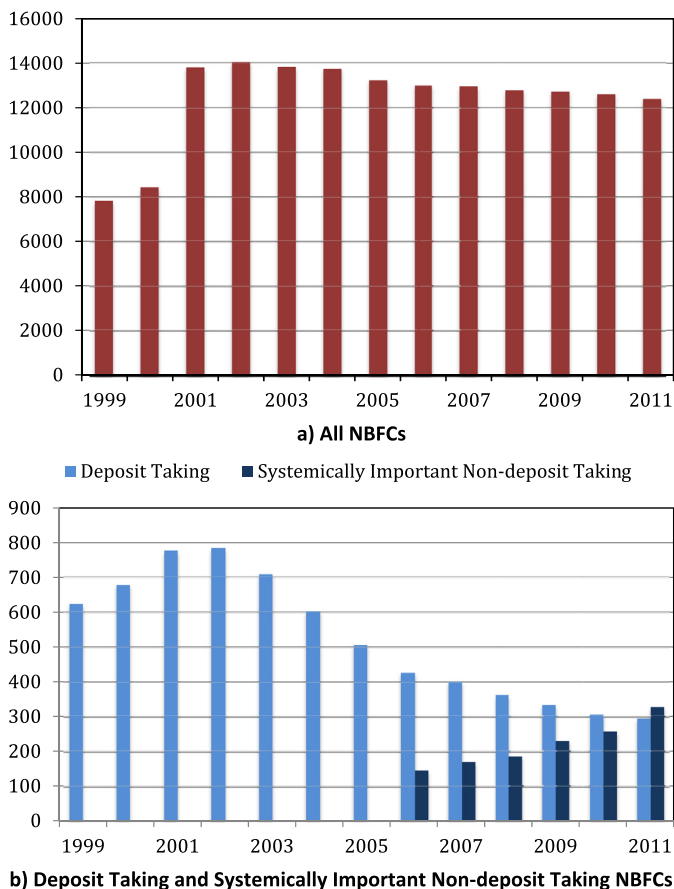
- 1) Deposit taking NBFCs;
- 2) Non-deposit taking NBFCs;
- 3) Core Investment Companies.

The new regulatory framework involved a prescription of prudential norms for deposit taking NBFCs to ensure that these NBFCs function on sound and healthy lines. However, the regulatory and supervisory attention was focused mainly on the deposit taking NBFCs to protect the interests of the depositors. The non-deposit taking NBFCs were kept subject to minimal regulation and, practically, Core Investment Companies were left out altogether.

Nevertheless, the 1998 NBFC regulations made a major impact on the growth of the NBFCs, and the number of NBFCs dropped to 7855 in March 1999 from 55,995 in March 1995 (Nisar and Aziz, 2004). For the deposit taking NBFCs, the number of companies dropped from 1429 in March 1998 to 624 in March 1999 in a single year, and although the number of deposit taking NBFCs increased gradually from 624 in March 1999 to a peak of 784 in March 2001, it started to decline thereafter and stood at 297 in March 2011. As for the deposits held by these companies, the deposits decreased from 237.7 billion rupees, comprising 52.3 percent of their total assets, in March 1998 to 172.7 billion rupees, comprising 15.7 percent of their total assets, in March 2010. Table 1 compares the deposit taking NBFC deposits to the bank deposits for the fiscal years 2006, 2010 and 2011, highlighting the substantial decline of NBFC deposits.

In 2006, the RBI introduced its next important set of NBFC regulations by revising the 1998 regulations to create a new NBFC category, the systemically important non-deposit taking NBFCs. The systemically important non-deposit taking NBFCs were defined as those non-deposit taking NBFCs

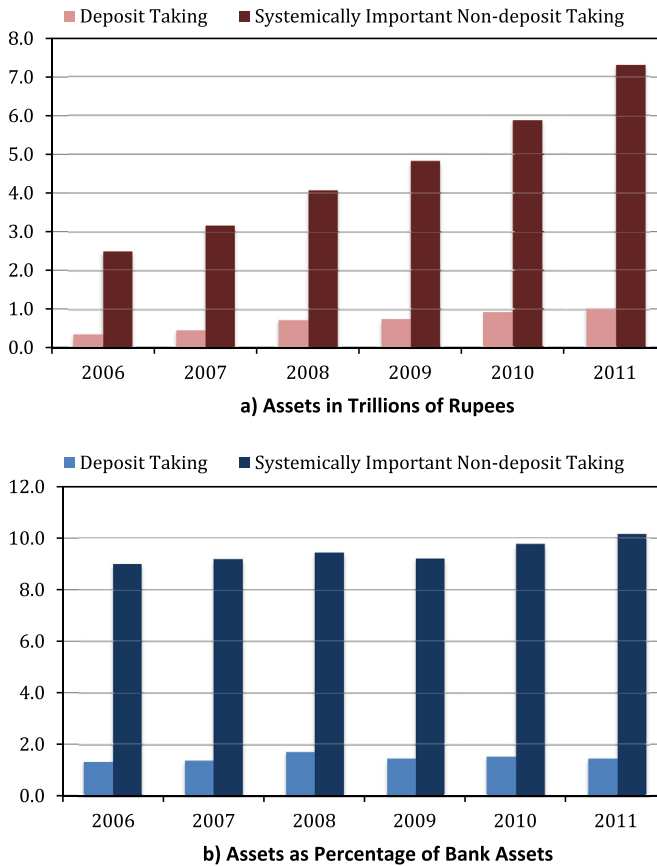
<sup>9</sup> <http://www.sundaramfinance.in/companyinfo/history.aspx>.



**Fig. 1.** Growth of the NBFC sector by number of NBFCs. The figure plots the time evolution of the number of NBFCs since 1999. The massive increase in the number of NBFCs in 2001 coincides with the scandals in the NBFC sector, which surfaced that year and continued into 2002. The scandals led the Reserve Bank of India to tighten NBFC regulations and the number of NBFCs has been declining since 2002. Further, the Reserve Bank of India encouragement of conversion of deposit taking NBFCs into non-deposit taking NBFCs led to a decrease in the number of deposit taking NBFCs, as is seen in the figure. Also visible in the figure is the emergence of systemically important non-deposit taking NBFCs in 2006, a new category the Reserve Bank of India introduced the same year. The Reserve Bank of India monitors both the deposit taking and systemically important non-deposit taking NBFCs closely. Source: The Reserve Bank of India.

with asset size of 1 billion rupees or more. Figs. 1 and 2 plot the growth of the systemically important non-deposit taking NBFCs – as well as deposit taking NBFCs – both in number and asset size from their introduction in 2006 until 2011. As is well-known, the concept of systemically important financial institutions became popular after the onset of ongoing global financial crisis in the summer of 2007 and a financial institution is considered systemically important if its failure poses a systemic risk to the financial system (Acharya and Öncü, 2013). The RBI definition of systemically important non-deposit taking NBFCs predates the ongoing financial crisis and is solely based on size.

Therefore, on the one hand, it may be argued that considering the non-deposit taking NBFCs with asset size of 1 billion rupees or more as systemically important might not be appropriate, since it is not clear if the individual failure of any of these NBFCs poses a systemic risk to the financial system. On the other hand, since the total assets of the Indian NBFCs exceed 8 trillion Rupees as of 2011 – which is about 12% of the total assets of the Indian commercial banks – it can be argued that their collective



**Fig. 2.** Growth of the NBFC sector by assets. The figure plots the total assets of deposit taking and systemically important non-deposit taking NBFCs in trillions of rupees, as well as percentage of total bank assets. The figure compares the sizes of deposit taking and systemically important non-deposit taking NBFCs.

Source: The Reserve Bank of India.

failure may pose a systemic risk to the financial system.<sup>10</sup> At a minimum, it may be more appropriate to consider the financial sector of the NBFCs – or subsectors of it, such as the sector of gold loan NBFCs as the current events in the gold market unfold – systemically important, although none of these NBFCs may be large enough on their own to cause a systemic collapse. Nevertheless, we will follow the RBI naming convention and refer to those non-deposit taking NBFCs with asset size of 1 billion rupees or more as systemically important non-deposit taking NBFCs as per the RBI convention.

<sup>10</sup> Following the Lehman collapse of September 15, 2008, one of the largest money market mutual funds (MMMFs), the Reserve Primary Fund, which was highly exposed to Lehman Brothers' collapsing short-term debt, had on the next day its net asset value (NAV) fall below par. Since MMMFs offer stable NAV and investors can redeem anytime at par, an immediate run on the Reserve Primary Fund occurred, causing it to shut down. This failure opened up the possibility that other MMMFs were similarly exposed and a run on the MMMFs started. Since MMMFs are a primary source for the commercial paper market, this run opened up the possibility of capital shortfalls at many financial institutions that needed to roll over commercial paper. Only after the US government guaranteed the MMMF deposits 100% the run came to a halt and the slide was stopped. Neither was the Reserve Primary Fund "too-big-to-fail" despite its \$64.8 billion worth of assets prior to its shut down, nor was it even a systemically important on its own right. What was systemically important in September 2008 was the \$3.5 trillion shadow-banking financial sector of MMMFs and the intervention had to be done at the sector level (Acharya and Öncü, 2013).

As of writing (April 2013), the deposit taking and non-deposit taking NBFCs are classified by the RBI into the following seven categories by function:

- 1) Investment Companies;
- 2) Core Investment Companies;
- 3) Asset Finance Companies;
- 4) Loan Companies;
- 5) Infrastructure Finance Companies;
- 6) Factoring Companies;
- 7) Micro Finance Institutions.

The last two categories are recent and were formerly Loan Company NBFCs. Our systemically important non-deposit taking NBFC dataset contains all of the above types, except the Core Investment Companies. We have no information in our dataset regarding which ones are Micro Finance Institutions and which ones are Factoring Companies.<sup>11</sup>

Since the main business of all types of the NBFCs from type 3 to type 7 is extending credit, we lump them into a super-category that we call the “Financing Companies”. Therefore, our systemically important non-deposit taking NBFC dataset comprises two NBFC types:

- 1) Investment Companies;
- 2) Financing Companies.

One important aspect of the Financing Company NBFCs is that many of them have sectoral focus.<sup>12</sup> However, since the names of the NBFCs are not available in our dataset, we are not able to map the NBFCs in our dataset to sectors. On the other hand, the city of incorporation of the NBFCs is known, allowing us to incorporate regional heterogeneity in demand for bank loans by the NBFCs, as well as for NBFC credit by the borrowers into our models. In India, there are six geographical regions: North, Northeast, East, Central, South and West. Because of economic similarities, we lump Northeast, East and Central regions into one region, that is, the East region and work with the following regions: East, North, South and West. We describe the regions in more detail in the next section when we describe our data.

## 2.2. Bank – NBFC linkages in India

The RBI classifies the commercial banks in India into five categories:

- 1) The SBI Group;
- 2) Nationalized Banks;
- 3) New Private Banks;
- 4) Old Private Banks;
- 5) Foreign Banks.

As of 2012 year-end, the size of the total assets of the Indian commercial banks was above 80 Trillion Rupees. The Nationalized Bank Group is the largest bank group by assets (about 50% of total bank assets), followed by the SBI Group (about 21%), New Private Bank Group (about 15%), Foreign Bank Group (about 8%) and Old Private Bank Group (about 5%), in that order. The SBI Groups consists of the State Bank of India (SBI) and its current five associates. The Nationalized Bank Group consists of 20 formerly private commercial banks, 14 of which were nationalized during the first bank nationalization

<sup>11</sup> For definitions of the NBFC types, for example, see: <http://www.rbi.org.in/scripts/FAQView.aspx?Id=71>.

<sup>12</sup> For example, see: <http://india-financing.com/An%20overview%20of%20the%20Indian%20NBFC%20Sector-%20Nidhi%20&%20Kamil.pdf>.

**Table 2**

Consolidated balance sheet of NBFCs (trillions of rupees). This table summarizes the consolidated balance sheet of the deposit taking and systemically important non-deposit taking NBFCs for the fiscal years 2006, 2010 and 2011.

	2006	%2006	2010	%2010	2011	%2011
<i>Liabilities</i>						
Share capital	0.2215	6.70%	0.4328	6.17%	0.4722	5.57%
Reserves & surplus	0.4774	14.44%	1.3931	19.88%	1.5868	18.73%
Public deposits	0.2284	6.91%	0.1735	2.48%	0.1196	1.41%
Borrowings	2.076	62.79%	4.4986	64.18%	5.7075	67.37%
B&FI loans	0.6231	18.85%	1.3172	18.79%	1.8384	21.70%
Current liabilities	0.3027	9.16%	0.5114	7.30%	0.5863	6.92%
Total liabilities	3.306	100.00%	7.0094	100.00%	8.4725	100.00%
<i>Assets</i>						
Loans and advances	1.6945	51.25%	4.1964	59.87%	5.3607	63.27%
Bill business	0.0005	0.01%	0.0005	0.01%	0.0009	0.01%
Hire purchase assets	0.4472	13.53%	0.4169	5.95%	0.5002	5.90%
Investments	0.8163	24.69%	1.5218	21.71%	1.6413	19.37%
Cash and Bank balances	NA	NA	0.2586	3.69%	0.2988	3.53%
Other current assets	NA	NA	0.4057	5.79%	0.4244	5.01%
Other assets	0.3476	10.51%	0.2097	2.99%	0.2462	2.91%
Total assets	3.306	100.00%	7.0094	100.00%	8.4725	100.00%

Source: Finance Ministry of the Government of India. [http://financialservices.gov.in/reports/Reports%20\\_NBFCs.pdf](http://financialservices.gov.in/reports/Reports%20_NBFCs.pdf).

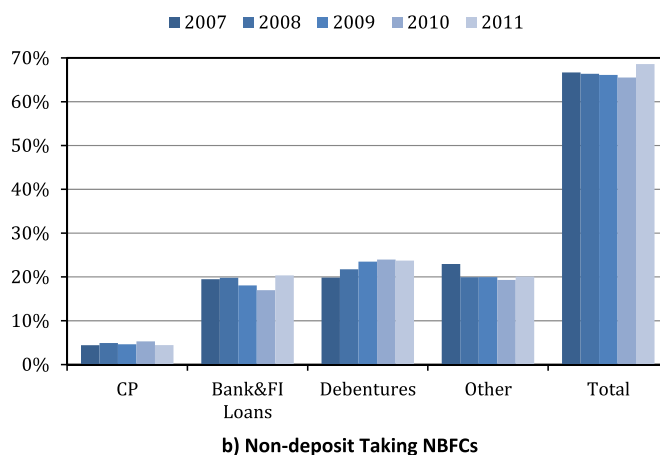
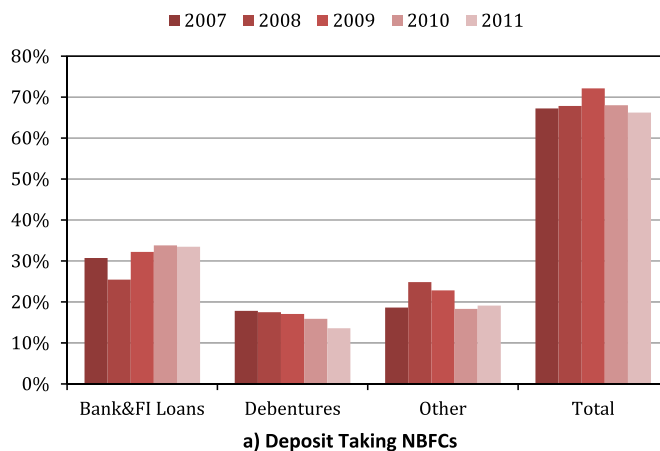
of 1969 while the remaining 6 of which were nationalized during the second bank nationalization of 1980. The Old Private Bank Group consists of 14 private banks, which were not nationalized at the time of bank nationalizations of 1969 and 1980, while the New Private Bank Group consists of 7 banks, which were established after the 1993 amendment – which followed the 1991 Indian economic liberalization reforms – to the Indian Banking Act, which permitted the entry of new private banks into Indian banking sector. Lastly, the Foreign Bank Group currently consists of 36 foreign banks either operating themselves or having their branches in India. Both domestic and foreign banks are subject to priority sector lending requirements, and the priority sector lending requirement is 40% for domestic banks and 32% for foreign banks of their adjusted net credit<sup>13</sup> as of December 2012.<sup>14</sup>

Table 2 summarizes the consolidated balance sheet of the deposit taking and systemically important non-deposit taking NBFCs for the fiscal years 2006, 2010 and 2011, whereas Fig. 3 depicts the debt structures of the deposit taking and systemically important non-deposit taking NBFCs from 2007 until 2011. Notable in these summary data are two facts: one, that loans to NBFCs from banks and financial institutions form a significant proportion of their liabilities, inducing a potential two-way linkage between the banking sector and the NBFCs; and, second that there is a steady decline in their public deposits (as stressed above), as well as in their current liabilities. Also notable from Fig. 3 is that the financial crisis that hit India in the fall of 2008 reduced the ability of systemically important non-deposit taking NBFCs to borrow from the banks more than the non-deposit taking NBFCs, whereas it is the other way around as far as their ability in issuing debentures is concerned.

One of the important aspects of the 2006 NBFC supervisory framework was the introduced capital adequacy requirement. The systemically important non-deposit taking NBFCs were required to maintain a capital to risk-weighted asset ratio (CRAR) of 10% while the CRAR requirement for the deposit taking NBFCs was left at 12% or 15%, as the case may be, depending on their types by function, which we list below. This CRAR requirement was later increased to 12% to be effective as of March 2011 and to 15% to be effective as of March 2012. Hence, in terms of capital requirements, unlike the typical

<sup>13</sup> Adjusted net bank credit is net bank credit plus the investments made by banks in held-to-maturity bonds which are not to meet the RBI liquidity requirements or it is the credit equivalent of off-balance-sheet exposures, whichever is higher.

<sup>14</sup> For definitions of the priority sectors and priority sector lending requirements, for example, see: <http://www.rbi.org.in/scripts/FAQView.aspx?Id=87>.



**Fig. 3.** Debt structure of NBFCs (borrowings per total assets). The figure plots the borrowings of deposit taking and systemically important non-deposit taking NBFCs as percentage of total assets. The figure shows that bank and financial institution borrowings is a major source of funding for both types of NBFCs, although deposit taking NBFC reliance on bank and financial institution borrowing is much larger. No commercial paper borrowing information is available for deposit taking NBFCs.

Source: The Reserve Bank of India.

shadow banks in other parts of the world, the Indian NBFCs are tightly regulated. This fact alone calls into question, whether it is appropriate to consider the Indian NBFCs as shadow banks or not. Nevertheless, the fact that these NBFCs are non-banks as far as investor perceptions are concerned (for example, concerning the extent of central bank support and government guarantees), but that they borrow heavily from banks makes them interesting for studying what economic purpose are they fulfilling and how shadow banking and banking in emerging markets are potentially intertwined.

### 3. The data

First, we collect individual NBFC data over the period from March 2006 to June 2011 from the RBI, consisting of NBFC-level balance sheet and non-performing asset data on those non-deposit taking NBFCs that are regarded systemically important by the RBI. The observation frequency is quarterly and the initial dataset is an imbalanced panel consisting of 383 NBFCs and 3629 NBFC-Quarters. We collect this data from the RBI without the names of the NBFCs. This dataset is private.

From this data set, we construct a quarterly dataset of the NBFC variables –defined in [Appendix II](#) – using the following selection criteria.

- 1) In each quarter, there is no missing/erroneous balance sheet data;
- 2) In each quarter, total assets should match total liabilities within 0.01% error;
- 3) The previous quarter balance sheet data exist and are as above.

By applying the above selection criteria, we get an imbalanced panel dataset of 257 NBFCs and 2374 NBFC-Quarters.

[Table 3](#) summarizes the regional distribution of the NBFCs and NBFC-Quarters in our resulting dataset, and shows that about 62% of the Investment Company NBFCs in the dataset are in the West region. Therefore, the regional heterogeneity among the Investment Company NBFCs is not significant. Indeed, majority of the Investment Company NBFCs operate in Mumbai, the financial capital of India. On the other hand, [Table 3](#) shows also that there is significant regional heterogeneity among the Financing Company NBFCs. The Financing Company NBFCs are distributed among the East, North, South and West regions roughly as 8%, 30%, 27% and 35%, respectively. We will incorporate regional heterogeneity of the Financing Company NBFCs in our models.

Second, we collect aggregate bank data from the RBI on the bank groups, namely, the SBI Group, the Nationalized Bank Group, the New Private Bank Group, the Old Private Bank Group and the Foreign Bank Group. This dataset is also quarterly – from March 2001 to June 2012 – and consists of bank group-level balance sheet and priority sector lending data on bank groups listed above. This dataset is private, also.

Thirdly, we collect aggregate bank branch data on bank groups, namely, the SBI Group, the Nationalized Bank Group, the New Private Bank Group, the Old Private Bank Group and the Foreign Bank Group from the RBI website. The observations are quarterly and the first observation is of March 2006. The data get updated at the RBI website on a quarterly basis. This dataset is publicly available.

Fourthly, we collect economic data on Indian 3 month and 10 year yields, gross domestic product and wholesale price index from the Economic and Political Weekly Research Database. This dataset is publicly available also, although subscription is required.

Lastly, we merge all of these datasets to construct our final dataset. Summary statistics of the data are given in [Table 4](#) and all variables are defined in [Appendix II](#).

#### 4. Empirical design

To examine the questions we posed in the Introduction, we start by analyzing how bank lending to and credit extension by the NBFCs are affected by NBFC type, as well as by the crisis of Fall 2008. In [Fig. 4a](#) and [b](#) we plot respectively the evolution of the bank loans to NBFCs and credit extension by

**Table 3**  
Regional distribution of the NBFCs in the dataset.

	IC	FC	Total
<i>Panel A: Number of NBFCs</i>			
East	17 (6.6%)	10 (3.9%)	27 (10.5%)
North	25 (9.8%)	38 (14.8%)	63 (24.6%)
South	8 (3.1%)	33 (12.9%)	41 (16.0%)
West	82 (32.0%)	43 (16.8%)	125 (48.8%)
Total	132 (51.6%)	124 (48.4%)	256 (100.0%)
<i>Panel B: Number of NBFC-Quarters</i>			
East	171 (7.2%)	88 (3.7%)	259 (10.9%)
North	222 (9.4%)	383 (16.1%)	605 (25.5%)
South	76 (3.2%)	292 (12.3%)	368 (15.5%)
West	755 (31.8%)	387 (16.3%)	1142 (48.1%)
Total	1224 (51.6%)	1150 (48.4%)	2374 (100.0%)

This table summarizes the regional distribution of the NBFCs and NBFC-Quarters in our dataset. Percentages are in parentheses.

**Table 4**  
Summary statistics.

Panel A: NBFC variables					
	Mean	St. Dev.	Min	Max	
$\Delta$ BL/A	0.014	0.097	-0.631	1.237	
$\Delta$ TC/A	0.035	0.172	-0.977	3.031	
Size	2.370	1.237	-0.440	6.973	
CAP	0.130	0.203	0.000	0.981	
LIQ	0.095	0.186	-0.044	1.000	
NPA	0.042	0.142	0.000	1.000	

Panel B: Indicator variables	
	Mean
IC	0.516
FC	0.484
CRISIS	0.748

Panel C: Economic variables				
	Mean	St. dev.	Min	Max
YCS	0.021	0.013	0.001	0.041
GDP	0.083	0.012	0.058	0.100
INF	0.073	0.010	0.005	0.110

Panel D: Priority sector lending variables							
	Mean	St. dev.	Min	Max	Correlations		
					$\Delta$ PSLALL/PSLALL	$\Delta$ PSLSBI/PSLALL	$\Delta$ PSLOTH/PSLALL
$\Delta$ PSLALL/PSLALL	0.046	0.048	-0.025	0.122	1.000		
$\Delta$ PSLSBI/PSLSBI	0.046	0.057	-0.078	0.173	0.631	1.000	
$\Delta$ PSLOTH/PSLOTH	0.046	0.055	-0.036	0.144	0.958	0.383	1.000

Panel E: Bank branching variables							
	Mean	St. dev.	Min	Max	Correlations		
					$\Delta$ RURALL	$\Delta$ RURSBI	$\Delta$ RUROTH
$\Delta$ RURALL	-0.011	0.011	-0.042	0.007	1.000		
$\Delta$ RURSBI	-0.008	0.017	-0.046	0.021	0.796	1.000	
$\Delta$ RUROTH	-0.012	0.011	-0.041	0.004	0.982	0.670	1.000

Panel F: Term deposit variables							
	Mean	St. dev.	Min	Max	Correlations		
					$\Delta$ TDLALL/TDALL	$\Delta$ TDSBI/TDSBI	$\Delta$ TDOTH/TDOTH
$\Delta$ TDLALL/TDALL	0.044	0.026	0.000	0.094	1.000		
$\Delta$ TDSBI/TDSBI	0.033	0.050	-0.045	0.145	0.588	1.000	
$\Delta$ TDOTH/TDOTH	0.047	0.027	0.009	0.112	0.898	0.171	1.000

This table provides summary statistics of the variables in the random NBFC and NBFC-Quarter effects regressions. All variables are defined in the Appendix. There are 2374 NBFC-quarters, 257 NBFCs and 21 quarters in the estimations.

NBFCs as percentage of their assets for the systemically important non-deposit taking NBFCs. Fig. 4a also depicts the effect of the Fall 2008 crisis, in particular, that banks decreased their lending to the NBFCs during the crisis. Similarly, Fig. 4b shows that the systemically important non-deposit taking NBFCs in our dataset reduced their lending during the Fall 2008 crisis substantially, although the reduction in bank credit extension during the crisis has been less severe.

Recall from the previous section that our dataset of individual NBFCs consists of Investment Company and Financing Company systemically important non-deposit taking NBFCs. While the main business of Financing Company NBFCs is extending credit, the main business of Investment Company NBFCs is the acquisition of securities. Indeed, Fig. 4b shows for our dataset that while the credit extended by Financing Company NBFCs is about 70% of their total assets, the credit extended by Investment Company NBFCs is only about 25% of their total assets, on the average. The credit extended by

all NBFCs is about 60%, on the average. More importantly, Fig. 4a shows for our dataset that while Financing Company bank loans constitute about 20% of their total liabilities, Investment Company bank loans constitute only about 5% of their total liabilities, on the average. The banks loans to all NBFCs are about 17% of their total liabilities, which is a sizeable amount.<sup>15</sup>

The significance of the above observations is that this sizeable bank lending to the NBFCs provides a direct link between the banks and NBFCs, creating a transmission mechanism of shocks between the banking and shadow banking systems. Indeed, when the 2008 Global Financial Crisis hit the Indian economy and the financial system, some of the worst liquidity conditions were experienced by the NBFCs. This withdrawal of liquidity appears to be a “shadow bank run” on the NBFCs, resulting from a “run” on the private sector banks<sup>16</sup> (transmitted to the NBFCs through bank loans) and mutual funds<sup>17</sup> (transmitted to the NBFCs through commercial paper).

Second, we analyze how bank lending to NBFCs was related to the deposit shifts across bank types in Fall 2008. Fig. 5a–c plots the time and demand deposit shares of each of the SBI Group, Nationalized Bank Group and New Private Bank Group, respectively. These figures show that although the Fall 2008 crisis did not have any noticeable effect on the demand deposits, term deposits migrated after the crisis from the New Private Banks to the SBI Group for about a year, and then moved also to the Nationalized Bank Group. As seen in Fig. 4a, this sectoral migration corresponds with the withdrawal of banks loans from the NBFCs.

Fig. 5c shows also that the term deposit market share of New Private Bank Group has experienced a permanent contraction shock since the Fall 2008 crisis, as percentage of the aggregate term deposits at all banks. It should be mentioned that, in addition to this sectoral migration, a maturity transformation from demand deposits to term deposits for the SBI and the Nationalized Bank Group (and reverse transformation for the New Private Bank Group) also took place during the Fall 2008 crisis (Acharya and Kulkarni, 2013). This maturity transformation, together with the sectoral migration, indicates that the overall deposit base during the Fall 2008 crisis of the New Private Banks contracted more than the term deposit migration from the New Private Banks indicates.

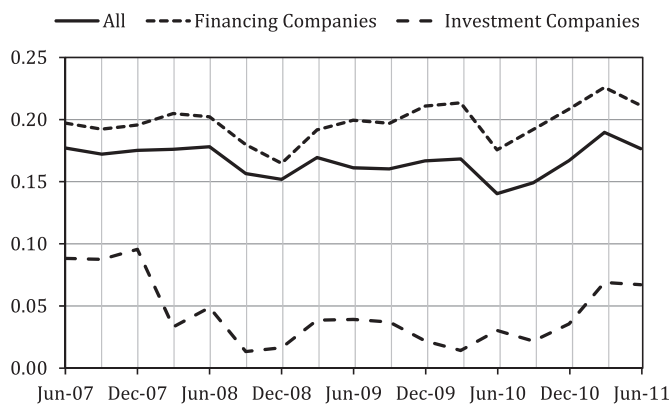
Third, we analyze the impact of the Fall 2008 crisis on the priority sector lending of the bank groups in India. Fig. 6a and b plots the per total credit priority sector lending of the bank groups and show that this withdrawal of bank loans from the NBFCs corresponds with a massive contraction in bank lending to the priority sectors in the summer of 2008. As is well-known, bank loans on accounts of funds on-lent by the NBFCs to priority sectors had been classified as priority sector lending until the April 2011 RBI intervention, declassifying such loans from priority sector lending.<sup>18</sup> However, with the exception

<sup>15</sup> Indeed, since bank loans are an important source of funds of the systemically important non-deposit taking NBFCs – particularly of the Financing Company NBFCs –, the RBI issued a separate circular to the banks on banks’ exposures to systemically important NBFCs in conjunction with the 2006 NBFC supervisory framework. In this circular, the exposure (both lending and investment, including off balance sheet exposures) of a bank to a single NBFC was restricted to a 15% or 10% maximum of the bank’s capital funds as per its last audited balance sheet, depending on whether the NBFC was an Asset Finance Company or not, respectively. These maxima were increased by 5%, if this excess amount is on account of funds on-lent by the NBFC to infrastructure sectors.

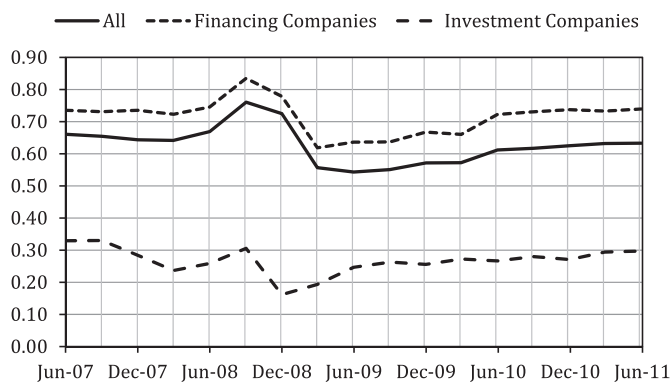
<sup>16</sup> In an interview we conducted, the then RBI Deputy Governor Usha Thorat described the situation as follows. “Especially the public sector bank deposits went up and the private sector bank deposits took a knock. So, the private sector banks were quite resource constrained. Also, the RBI facilities were mostly collateralized ones against government securities and private sector banks did not have sufficient securities above the statutory requirements to be able to take RBI liquidity – which meant they were constrained on liquidity at the same time that lending by banks to NBFCs decelerated. In Aug 2008, some NBFCs faced a liquidity problem. Many of them were even doubtful whether their CPs would be rolled over. Some of them had to have liquidity infusion from their sponsors. Bank credit lines started choking. The mutual funds, which had invested in the NBFCs’ short-term paper, withdrew or started selling these. In fact, the vulnerability of this sector to liquidity risk got exposed. There was huge pressure on the RBI to open a liquidity window special for NBFCs. The RBI Act prohibits lending to non-banks (except for some very few categories) and so we did open a window through banks. But banks were quite reluctant to use it as they had to take credit risk of NBFCs, which they started getting very wary about. When banks were unwilling to finance NBFCs, the RBI opened a special facility through a structured vehicle, which was already located in the IDBI.”

<sup>17</sup> Aziz et al. (2008) describe the run on mutual funds as follows. “Traditionally, local firms placed a significant amount of short-term funds with mutual funds (both debt and equity) because these are tax-advantaged. When the Indian money market became tight, these firms redeemed their investments in mutual funds to finance their own funding needs. This set off a wave of redemptions for mutual funds.”

<sup>18</sup> Two months before the end of our observation period.



a) Bank Loans

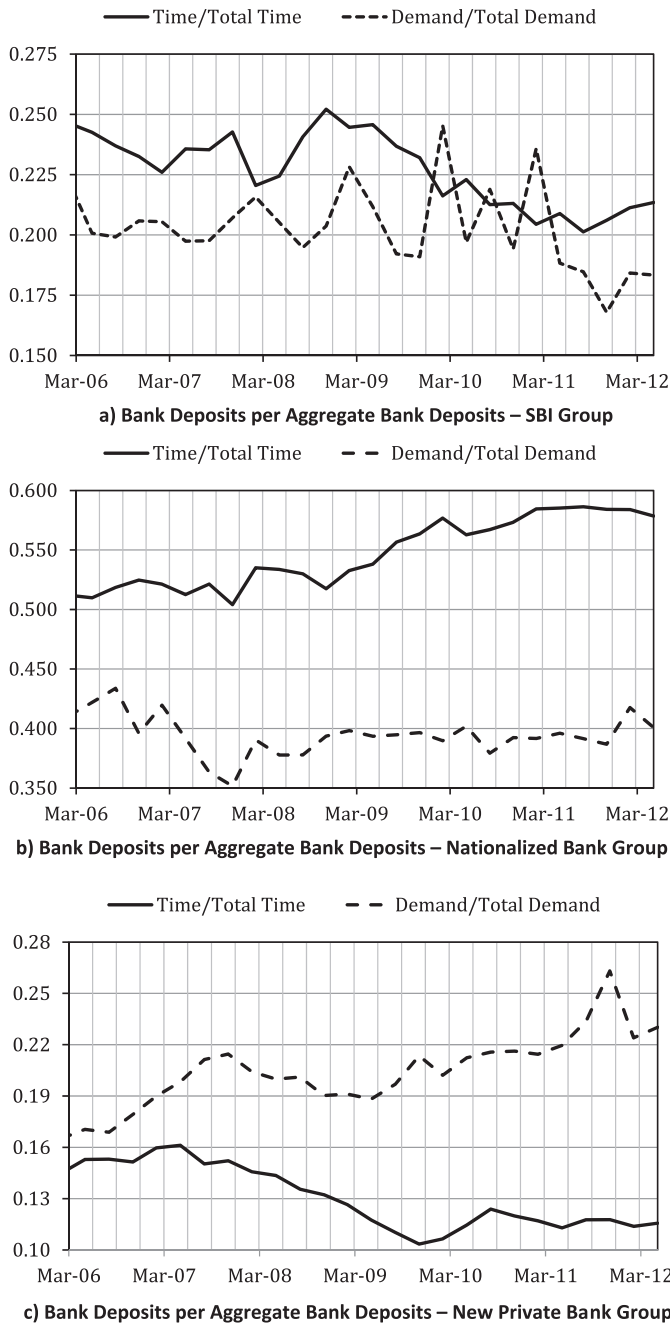


b) NBFC Credit

**Fig. 4.** Evolution of bank loans to and credit extension of systemically important non-deposit taking NBFCs (per assets). Fig. 4a plots the evolution of the bank loans to the systemically important non-deposit taking NBFCs in our data set, as percentage of their assets. Fig. 4a shows that the Financing Company NBFCs are more reliant on the bank loans than the Investment Company NBFCs and depicts the influence of the Fall 2008 crisis on bank loans to NBFCs. Fig. 4b plots the evolution of the credit extension of systemically important non-deposit taking NBFCs in our data set, as percentage of their assets. Fig. 4b shows that the systemically important non-deposit taking NBFCs in our data set reduced their lending during the Fall 2008 crisis substantially.

of the last quarter in our observation period, bank loans on accounts of funds on-lent by the NBFCs to priority sectors had been considered as priority sector lending by the RBI.

Our last observation is related with the rural bank branch presence of the Indian bank groups relative to their urban bank branch presence. The SBI Group has the largest rural presence relative to urban presence and the Nationalized Bank Group, Old Private Bank Group, New Private Bank Group and Foreign Bank Group follow the SBI Group, in that order. The rural presence of the foreign banks is virtually non-existent. The significance of this is that much of the priority sector lending takes place in the rural areas. Furthermore, much of the NBFC lending takes place in rural areas. Therefore, banks that have lower branching in rural areas relative to urban areas may have higher incentives to lend to the NBFCs that on-lend the funds to the priority sectors to meet their priority sector lending targets (at least, until the April 2011 RBI declassification of such loans from priority sector lending, and there are rumors as of April 2013 that the situation may change, and the RBI may allow the banks to do their priority sector lending through lending to the NBFCs again).



**Fig. 5.** Sectoral migration of bank deposits. Fig. 5a–c plots the time and demand deposit shares of each of the SBI Group, Nationalized Bank Group and New Private Bank Group, respectively. These figures show that, although the Fall 2008 crisis did not have any noticeable effect on the demand deposits, after the crisis, term deposits migrated from the New Private Banks to the SBI Group for about a year, and then moved to the Nationalized Bank Group. It shows also that the term deposit market share of New Private Bank Group has experienced a permanent contraction shock since the Fall 2008 crisis, as percentage of the aggregate term deposits.

Motivated by these observations, we now seek to answer the five questions posed in the Introduction concerning how bank lending to the NBFCs is affected by bank and NBFC type or heterogeneity, and how this lending was affected by the deposit shifts across bank types in Fall 2008. Had we known the direct lending linkages between the banks and NBFCs at the institution level, these questions could have been addressed in a relatively straightforward manner. Given the absence of such data, we try to address this question using the bank group-level data as follows: we separate the SBI Group from the rest and collect the rest of the groups in a category we call the Other Bank Groups. We then look at how the priority sector lending, bank branching and term deposits of the SBI Group and the Other Bank Groups influence aggregate bank lending to the NBFCs and, in turn, overall NBFC credit extension. The rationale for this grouping arises from the fact the SBI Group has the strongest non-urban branching network and it enjoyed the greatest term deposit migration in Fall 2008 due to it being the strongest set of banks in terms of perceived government guarantees.

Prior to describing our empirical specifications, we emphasize that although we work with individual NBFC data, neither there are any individual bank data, nor any individual bank to individual NBFC linkage data, nor any other micro-level data on corporate and retail NBFC as well as bank borrowers in our dataset,<sup>19</sup> so as to control for varying demand conditions for the NBFC and/or bank credit. Since all of the questions we seek to answer are concerned with the credit supply from banks to NBFCs as well as from NBFCs to their clients, identification in our tests could be in question without some control on demand for credit, particularly for the Financing Company NBFCs. We address this issue at three levels as follows.

First, we exploit the fact that most of the Financing Company NBFCs operate locally. In the presence of sufficiently granular data, a good approach to controlling for variations in credit demand would have been incorporating some regional activity measures into the models. This would have allowed us to control not only for regional, but also for temporal variations in credit demand conditions. However, quarterly regional activity measures are not available in India and, therefore, we introduce Financing Company Regional dummies for the East ( $R_1$ ), North ( $R_2$ ), South ( $R_3$ ) and West ( $R_4$ ) regions described in the previous section into our regressions as a second-best approach.

Second, since many Financing Company NBFCs have sectoral focus and changing economic conditions influence different sectors differently, controlling for variations in sectoral credit demand is also desirable. In the absence of such sectoral information, we incorporate region-specific NBFC random effects into our models to address sectoral variations in credit demand.

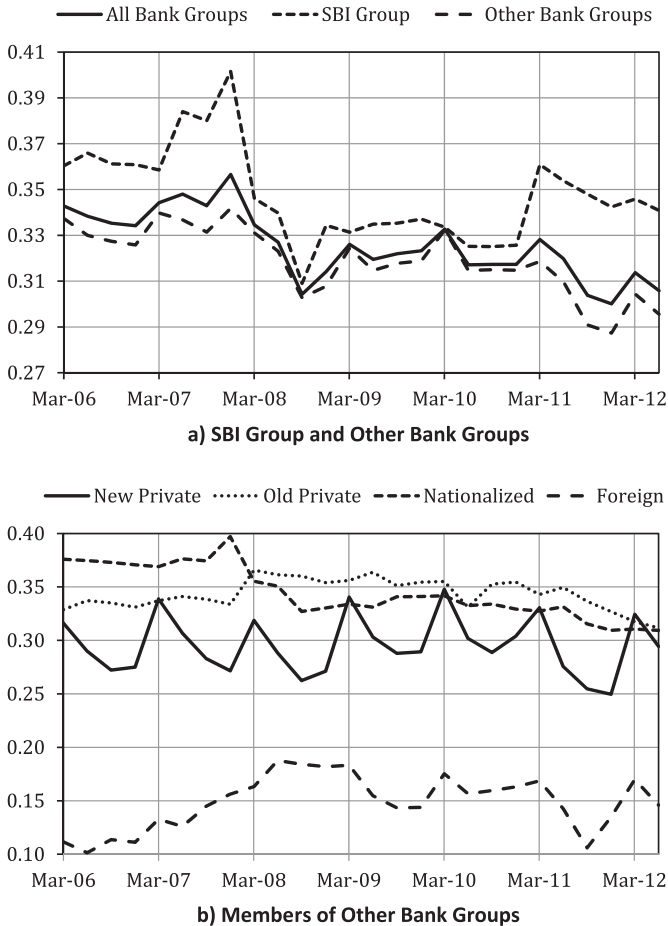
And, third, we introduce region-specific NBFC-Quarter random effects to account for temporal variations in credit demand conditions.

In view of the above, the generic Financing Company random effects equation we estimate to obtain our results is:

$$y_{it} = \alpha IC_i + \sum_{K=1}^4 \beta_{kit} R_{ki} \times FC_i + \mu' z_t \times IC_i + \nu' z_t \times FC_i + \delta' x_{it} + e_{it} \quad (1)$$

where  $y_{it}$  is the NBFC-specific dependent variable for the  $i$ th NBFC in the  $t$ th quarter,  $IC_i$ ,  $FC_i$ , and  $R_{ki}$ ,  $k = 1, 2, 3, 4$  are the respective Investment Company, Financing Company and Region indicators for the  $i$ th NBFC such that  $IC_i$  is equal to one if the  $i$ th NBFC is an Investment Company and zero otherwise,  $FC_i$  is equal to one if the  $i$ th NBFC is a Financing Company and zero otherwise and  $R_{ki}$  is equal to one if the  $i$ th NBFC is in the  $k$ th region and zero otherwise;  $z_t$  is the vector consisting of the  $CRISIS_t$  indicator such that  $CRISIS_t$  is equal to one if the  $t$ th quarter is between September quarter of 2008 and June quarter of 2011, inclusive, and zero otherwise, and of the bank group variables in the  $t$ th quarter;  $x_{it}$  is the vector of control variables consisting of NBFC-specific and economic explanatory variables for the  $i$ th NBFC in the  $t$ th quarter and  $e_{it}$  is the error term. The region specific Financing Company NBFC and NBFC-Quarter random effects are specified as:

<sup>19</sup> Such data are not available not only in India, but also in most emerging market countries with quarterly frequency. In most cases, such data are not available even with annual frequency.



**Fig. 6.** Bank priority sector lending as percentage of bank credit. The figure plots the priority sector lending per total credit of the bank groups in India. The target of priority sector lending of the domestic banks is 40% of their adjusted net credit (see: [www.rbi.org.in](http://www.rbi.org.in) for definition) and whereas it is 32% for foreign banks as of December 2012. The figure shows the clear effect of Fall 2008 crisis on the priority sector lending of all bank groups.

$$\beta_{kit} = \beta_k + u_{ki} + v_{kit}, \quad k = 1, 2, 3, 4,$$

where  $e_{it}$ ,  $u_{ki}$  and  $v_{kit}$ ,  $k = 1, 2, 3, 4$ , are identically and independently distributed normal variables.

## 5. Results

For our primary dependent variables – bank lending to NBFC and NBFC extension of credit – we use the quarterly change in bank loans to the NBFC scaled by the previous quarter assets of the NBFC and the quarterly change in total credit extended by the NBFC scaled by the previous quarter assets of the NBFC, respectively. We present our Financing Company NBFC and NBFC-Quarter random effects Maximum Likelihood regression results in Tables 5–7. These tables analyze the impact of bank group variables on bank lending to NBFCs and NBFC credit extension by NBFC type and Financing Company Regions, as well as the effect of the Fall 2008. In all of the regressions, we use the NBFC size, capitalization, liquidity and non-performing asset variables as the NBFC-specific, and yield curve slope, GDP

**Table 5**

Impact of the crisis and bank priority sector lending on bank lending to NBFCs and NBFC credit extension by bank group, NBFC type and NBFC region.

Panel A: Bank loans to NBFCs				
Dependent variable	$\Delta BL/A$			
	(1)	(2)	(3)	(4)
IC	0.017 (0.021)	0.018 (0.021)	0.017 (0.021)	0.018 (0.021)
FC × R <sub>1</sub>	0.095** (0.040)	0.104*** (0.040)	0.096** (0.040)	0.096** (0.040)
FC × R <sub>2</sub>	0.062** (0.030)	0.071** (0.030)	0.063** (0.030)	0.063** (0.030)
FC × R <sub>3</sub>	0.066*** (0.025)	0.075*** (0.024)	0.066*** (0.025)	0.066*** (0.025)
FC × R <sub>4</sub>	0.042* (0.023)	0.051** (0.022)	0.042* (0.023)	0.043* (0.023)
IC × CRISIS	−0.002 (0.005)	−0.003 (0.005)	−0.003 (0.005)	−0.003 (0.005)
FC × CRISIS	−0.027*** (0.008)	−0.029*** (0.008)	−0.026*** (0.008)	−0.027*** (0.008)
IC × $\Delta PSLALL/PSLALL$	−0.025 (0.033)			
FC × $\Delta PSLALL/PSLALL$	0.209*** (0.064)			
IC × $\Delta PSLSBI/PSLSBI$		0.000 (0.028)		0.012 (0.030)
FC × $\Delta PSLSBI/PSLSBI$		0.078 (0.054)		0.012 (0.058)
IC × $\Delta PSLOTH/PSLOTH$			−0.027 (0.029)	−0.032 (0.032)
FC × $\Delta PSLOTH/PSLOTH$			0.187*** (0.056)	0.182*** (0.061)
Log-Likelihood	2681.39	2676.80	2681.72	2681.82
Panel B: NBFC credit extension				
Dependent variable	$\Delta TC/A$			
	(1)	(2)	(3)	(4)
IC	0.054 (0.046)	0.029 (0.046)	0.062 (0.046)	0.064 (0.046)
FC × R <sub>1</sub>	0.171*** (0.058)	0.142** (0.058)	0.179*** (0.059)	0.181*** (0.059)
FC × R <sub>2</sub>	0.240*** (0.089)	0.210** (0.089)	0.247*** (0.089)	0.249*** (0.089)
FC × R <sub>3</sub>	0.161*** (0.048)	0.132*** (0.048)	0.168*** (0.048)	0.170*** (0.048)
FC × R <sub>4</sub>	0.123** (0.048)	0.094** (0.047)	0.130** (0.048)	0.133** (0.048)
IC × CRISIS	−0.020* (0.012)	−0.015 (0.011)	−0.023** (0.012)	−0.025** (0.012)
FC × CRISIS	−0.072*** (0.014)	−0.066*** (0.014)	−0.075*** (0.014)	−0.077*** (0.014)
IC × $\Delta PSLALL/PSLALL$	−0.155* (0.082)			
FC × $\Delta PSLALL/PSLALL$	−0.284*** (0.100)			
IC × $\Delta PSLSBI/PSLSBI$		−0.003 (0.069)		0.074 (0.075)
FC × $\Delta PSLSBI/PSLSBI$		−0.068 (0.085)		0.041 (0.091)
IC × $\Delta PSLOTH/PSLOTH$			−0.169** (0.073)	−0.201** (0.079)
FC × $\Delta PSLOTH/PSLOTH$			−0.277*** (0.088)	−0.294*** (0.095)
Log-Likelihood	1056.37	1051.00	1058.10	1058.69

The Financing Company NBFC and NBFC-Quarter random effects maximum likelihood regressions in this table examine the impact of the crisis and priority sector lending of the banks on bank lending to NBFCs and NBFC credit extension by bank groups, NBFC type and Financing Company Regions. Control variables are SIZE, CAP, LIQ, NPA, YCS, GDP and INF. All variables are defined in Appendix. All models are statistically significant at 1% relative to the null model. There are 2374 NBFC-quarters, 257 NBFCs and 21 quarters in the estimations. Standard errors are in parentheses. \*\*\* Significant at 1%; \*\* significant at 5%; \* significant at 10%.

growth and inflation variables as the economy-specific control variables. All variables are defined in Appendix II.

In Table 5, the bank group variables we consider are percentage quarterly changes in priority sector lending of All Banks, the SBI Group and Other Bank Groups. In Table 6, our bank group variables are the quarterly changes in the rural to urban branch ratios of All Banks, the SBI Group and Other Bank Groups. And, lastly, in Table 7, our bank group variables are the percentage quarterly changes in term deposits at All Banks, the SBI Group and Other Bank Groups.

An important result from Tables 5–7 is that bank variables have no impact on the ability of the Investment Company NBFCs – neither to borrow from banks nor to lend to their borrowers during our observation period. This result comes as no surprise because the main business of the Investment

**Table 6**

Impact of the crisis and bank branching on bank NBFC lending and NBFC credit extension by bank group, NBFC type and NBFC region.

Panel A: Bank loans to NBFCs				
Dependent variable	$\Delta BL/A$			
	(1)	(2)	(3)	(4)
IC	0.021 (0.021)	0.047 (0.023)	0.022 (0.021)	0.016 (0.023)
FC $\times R_1$	0.095** (0.040)	0.097** (0.041)	0.096** (0.040)	0.090** (0.041)
FC $\times R_2$	0.063** (0.031)	0.067** (0.031)	0.064** (0.030)	0.058* (0.032)
FC $\times R_3$	0.066** (0.026)	0.068** (0.026)	0.066** (0.025)	0.060** (0.027)
FC $\times R_4$	0.041* (0.024)	0.044* (0.025)	0.042* (0.023)	0.036 (0.025)
IC $\times$ CRISIS	-0.005 (0.006)	-0.002 (0.007)	-0.005 (0.006)	-0.003 (0.007)
FC $\times$ CRISIS	-0.020** (0.010)	-0.022** (0.010)	-0.021** (0.009)	-0.018* (0.010)
IC $\times$ $\Delta$ RURALL	0.134 (0.185)			
FC $\times$ $\Delta$ RURALL	-0.604* (0.355)			
IC $\times$ $\Delta$ RURSBI		0.004 (0.130)		-0.071 (0.153)
FC $\times$ $\Delta$ RURSBI		-0.297 (0.233)		-0.144 (0.271)
IC $\times$ $\Delta$ RUROTH			0.160 (0.179)	0.211 (0.211)
FC $\times$ $\Delta$ RUROTH			-0.585* (0.346)	-0.479 (0.402)
Log-Likelihood	2677.47	2676.57	2677.59	2677.81
Panel B: NBFC credit extension				
Dependent variable	$\Delta TC/A$			
	(1)	(2)	(3)	(4)
IC	0.046 (0.047)	0.004 (0.050)	0.047 (0.047)	-0.008 (0.051)
FC $\times R_1$	0.151** (0.059)	0.109* (0.062)	0.154*** (0.059)	0.097 (0.062)
FC $\times R_2$	0.219** (0.090)	0.177** (0.091)	0.222** (0.090)	0.166* (0.092)
FC $\times R_3$	0.141*** (0.049)	0.098* (0.052)	0.144*** (0.049)	0.087* (0.053)
FC $\times R_4$	0.104** (0.049)	0.060 (0.052)	0.107** (0.049)	0.049 (0.053)
IC $\times$ CRISIS	-0.026* (0.014)	-0.005 (0.015)	-0.028** (0.013)	-0.007 (0.015)
FC $\times$ CRISIS	-0.074*** (0.016)	-0.052*** (0.017)	-0.076*** (0.016)	-0.054*** (0.018)
IC $\times$ $\Delta$ RURALL	0.563 (0.457)			
FC $\times$ $\Delta$ RURALL	0.370 (0.562)			
IC $\times$ $\Delta$ RURSBI		-0.231 (0.315)		-0.749** (0.370)
FC $\times$ $\Delta$ RURSBI		-0.502 (0.376)		-1.026** (0.437)
IC $\times$ $\Delta$ RUROTH			0.769* (0.443)	1.303** (0.519)
FC $\times$ $\Delta$ RUROTH			0.647 (0.545)	1.381** (0.633)
Log-Likelihood	1051.63	1051.72	1052.84	1057.02

The Financing Company NBFC and NBFC-Quarter random effects maximum likelihood regressions in this table examine the impact of the crisis and changes in bank branching in rural areas relative to urban areas of the banks on bank lending to NBFCs and NBFC credit extension by bank groups, NBFC type and Financing Company Regions. Control variables are SIZE, CAP, LIQ, NPA, YCS, GDP and INF. All variables are defined in the Appendix. All models are statistically significant at 1% relative to the null model. There are 2374 NBFC-quarters, 257 NBFCs and 21 quarters in the estimations. Standard errors are in parentheses. \*\*\* Significant at 1%; \*\* significant at 5%; \* significant at 10%.

Company NBFCs is the acquisition of securities. Unlike the Financing Company NBFCs, the Investment Company NBFCs in India are not in the credit intermediation business. It is the Financing Company NBFCs that are in the credit intermediation business and are affected by the extent of bank lending to them.

A second important result from Tables 5–7 is that both the bank lending to Financing Company NBFCs and the Financing Company NBFC credit expansion experienced a permanent contraction shock with the Fall 2008 crisis, even after controlling for Financing Company specific regional, sectoral and temporal variations. Yet, the crisis had no noticeable impact on the ability of the Investment Company NBFCs, neither to borrow from banks nor to lend to their borrowers.

A third important result from Tables 5–7 is two-fold:

- 1) As far as borrowing from the banks is concerned, the Financing Company NBFCs in the East rely on the banks the most (per assets), whereas the Financing Company NBFCs in the West rely on the

**Table 7**

Impact of the crisis and term deposits at banks on bank lending to NBFCs and NBFC credit extension by bank group, NBFC type and NBFC region.

PANEL A: Bank loans to NBFCs				
Dependent variable	$\Delta BL/A$			
	(1)	(2)	(3)	(4)
IC	0.028 (0.022)	0.016 (0.021)	0.028 (0.022)	0.029 (0.022)
FC $\times R_1$	0.128*** (0.041)	0.116*** (0.039)	0.115*** (0.041)	0.125*** (0.041)
FC $\times R_2$	0.096*** (0.031)	0.084*** (0.030)	0.082*** (0.031)	0.092*** (0.032)
FC $\times R_3$	0.099*** (0.026)	0.087*** (0.024)	0.086*** (0.026)	0.095*** (0.026)
FC $\times R_4$	0.075*** (0.024)	0.063*** (0.022)	0.062** (0.024)	0.071*** (0.024)
IC $\times$ CRISIS	-0.002 (0.005)	-0.002 (0.005)	-0.004 (0.005)	-0.002 (0.005)
FC $\times$ CRISIS	-0.031*** (0.008)	-0.032*** (0.008)	-0.029*** (0.008)	-0.031*** (0.009)
IC $\times$ $\Delta$ TDALL/TDALL	-0.125 (0.110)			
FC $\times$ $\Delta$ TDALL/PSLALL	-0.296* (0.155)			
IC $\times$ $\Delta$ TDSBI/TDSBI		0.046 (0.041)		0.013 (0.046)
FC $\times$ $\Delta$ TDSBI/TDSBI		-0.173*** (0.067)		-0.209*** (0.071)
IC $\times$ $\Delta$ TDOTH/TDOTH			-0.103 (0.077)	-0.142 (0.087)
FC $\times$ $\Delta$ TDOTH/TDOTH			-0.061 (0.128)	-0.060 (0.134)
Log-Likelihood	2677.63	2680.53	2676.67	2681.87
Panel B: NBFC credit extension				
Dependent variable	$\Delta TC/A$			
	(1)	(2)	(3)	(4)
IC	0.051 (0.049)	0.032 (0.045)	0.070 (0.048)	0.059 (0.049)
FC $\times R_1$	0.173*** (0.061)	0.143** (0.058)	0.192*** (0.060)	0.182*** (0.061)
FC $\times R_2$	0.241*** (0.091)	0.212** (0.089)	0.261*** (0.090)	0.251*** (0.091)
FC $\times R_3$	0.163*** (0.051)	0.133*** (0.048)	0.183*** (0.051)	0.173*** (0.051)
FC $\times R_4$	0.125** (0.051)	0.095** (0.048)	0.144*** (0.051)	0.135*** (0.051)
IC $\times$ CRISIS	-0.014 (0.012)	-0.021* (0.012)	-0.018 (0.012)	-0.020* (0.012)
FC $\times$ CRISIS	-0.069*** (0.014)	-0.074*** (0.014)	-0.073*** (0.014)	-0.076*** (0.014)
IC $\times$ $\Delta$ TDALL/TDALL	-0.285 (0.250)			
FC $\times$ $\Delta$ TDALL/PSLALL	-0.481* (0.274)			
IC $\times$ $\Delta$ TDSBI/TDSBI		0.232** (0.097)		0.139 (0.108)
FC $\times$ $\Delta$ TDSBI/TDSBI		0.205* (0.112)		0.122 (0.122)
IC $\times$ $\Delta$ TDOTH/TDOTH			-0.383** (0.182)	-0.260 (0.202)
FC $\times$ $\Delta$ TDOTH/TDOTH			-0.575*** (0.211)	-0.451** (0.228)
Log-Likelihood	1052.25	1054.32	1055.45	1056.44

The Financing Company NBFC and NBFC-Quarter random effects maximum likelihood regressions in this table examine the impact of the crisis and term deposits at the banks on bank lending to NBFCs and NBFC credit extension by bank groups NBFC type and Financing Company Regions. Control variables are SIZE, CAP, LIQ, NPA, YCS, GDP and INF. All variables are defined in the Appendix. All models are statistically significant at 1% relative to the null model. There are 2374 NBFC-quarters, 257 NBFCs and 21 quarters in the estimations. Standard errors are in parentheses. \*\*\* Significant at 1%; \*\* significant at 5%; \* significant at 10%.

banks the least (per assets), as can be seen from the first panels (Panel A) of all of the above tables. Given it is well-known that the West is the most (and the East is the least) financially developed region of India, this result is consistent with the expected regional variation in bank lending to NBFCs.

- As far as NBFC credit extension is concerned, the Financing Company NBFCs in the North lend the most (per assets), whereas the Financing Company NBFCs in the West lend the least (per assets), as can be seen from the second panels (Panel B) of all of the above tables. The result that the Financing Company NBFCs in the West lend the least is expected also, because – West being the most financially developed region of India – in the West, there are many outlets to borrow from, both for the corporate and retail clients. We conjecture that the greater lending by the NBFCs in the North may be attributable to their greater focus on infrastructure where financing needs tend to be greater in magnitude. Further, it is possible also that some of the Northern NBFCs are state-owned

NBFCs, lending to infrastructure projects around to country (so that their lending is not regional), but reporting their lending in Delhi.

Turning our attention to the bank group variables, let us now consider Table 5 in which we investigate impact of bank priority sector lending on bank lending to the NBFCs and the NBFC credit extension. It is evident from Panel A that while the priority sector lending of the SBI Group has no relation with the Financing Company NBFC borrowing from the banks, an increase in the priority sector lending of the Other Bank Groups indicates an increase in the Financing Company NBFC borrowing from the banks. The relationship between the Financing Company NBFC borrowing from the banks and the Other Bank Groups is statistically significant at 1% level. As a check on economic significance we run the following experiment.

Since the Financing Company NBFCs in the East rely on the banks most heavily, we consider a Financing Company NBFC in the East and evaluate our dependent bank lending to NBFC variable, that is, the quarterly change in bank loans to the NBFC scaled by the previous quarter assets of the NBFC, at the sample means of all of the explanatory variables for Model (3) in Panel A of Table 5. We set the crisis dummy, that is, the explanatory variable CRISIS, to one, so we are looking at the period after the onset of the crisis. We then reevaluate the dependent variable by shocking up the percentage quarterly change (i.e., change from previous quarter to the current quarter scaled by that of the previous quarter) in priority sector lending of the Other Bank Groups. The pre and post values – in percentage terms – are 7.59% and 8.62%, respectively. Therefore, a one standard deviation shock to the percentage change in priority sector lending of the Other Bank Groups corresponds to a 1.03% increase in the bank loans to the NBFC (scaled by the previous quarter assets of the NBFC over a quarter).<sup>20</sup>

In Table 6, we investigate the impact of quarterly changes in bank branching in rural areas relative to urban areas on bank lending to the NBFCs and the NBFC credit extension. Our results indicate that the relationship between the changes in bank branching in rural areas relative to urban areas on bank lending to the NBFCs and the NBFC credit extension is marginally significant.<sup>21</sup> In particular, an increase in the rural bank branches relative to urban bank branches of the Other Bank Groups indicate a decrease in the bank loans to Financing Company NBFCs and increase in the NBFCs credit extension (though this latter effect is statistically insignificant). It is evident, however, that changes in the SBI Groups bank branching in rural areas relative to urban areas have no impact on bank lending to the NBFCs and the NBFC credit extension.

Lastly, in Table 7, we study the effect of term deposits at the banks on bank lending to NBFCs and NBFC credit extension. Panel A shows that as deposits build up at the SBI Group, bank lending to the NBFCs decreases whereas deposit build-up at neither the Other Bank Groups nor the entire sector has any influence on bank lending to the NBFCs. This is consistent with our earlier results that the SBI Group's priority sector lending does not affect bank lending to the NBFCs, so that a shift of deposits into the SBI Group would increase the SBI Group's priority sector lending (as documented by Acharya and Kulkarni, 2013, starting the Fall of 2008), but this would not translate into greater lending to the NBFCs as the SBI Group has a deep rural branch network of its own. However, since shift into the SBI Group is a flight of deposits away from other groups, bank lending to NBFCs falls in the term deposits of the SBI Group.

An interesting result from Panel B is that while an increase in term deposits at the SBI Group corresponds with an increase, an increase in term deposits at the Other Bank Groups corresponds with a decrease in the credit extension of the Financing Company NBFCs. One

<sup>20</sup> A similar experiment with the NBFC credit extension led to a similar conclusion. Tests of the same nature indicate economic significance for the term deposit build up at the banks but not for bank branching of the banks, both for the bank lending to NBFCs and NBFC credit extension.

<sup>21</sup> This picture changes, if we exclude the CRISIS dummy. The results still indicate that quarterly changes in none of the bank branch ratios have any influence on Investment Company NBFCs. However, quarterly changes in the bank branch ratios influence Financing Company NBFCs. As the bank groups increase their rural presence, the bank lending to the NBFC and the NBFC credit extension decrease. However, when we re-estimate the models in Table 6 by restricting the parameters of the bank ratio variables to zero, we are unable to reject the restrictions for seven of the eight models, indicating that bank branch variables do not add much beyond and above the effect of the crisis.

explanation for this result – based on the observation from Fig. 3b – is that when the ability of the non-deposit taking NBFCs to borrow from the banks went down with the crisis, they started to borrow in the debt market to compensate for this loss of bank funding. However, this switch from bank borrowing to debenture issuance corresponds with the migration of term deposits to the SBI Group. Hence, it may be difficult to disentangle the effects of the crisis and term deposit migration on the NBFC credit extension without controlling for other sources of funding to the non-deposit taking NBFCs.

We also address some robustness issues. It is believed by many that the crisis that started in September 2008 ended a year later. To address this issue, we define a post-crisis variable we label POSTCRISIS and add this variable to the regressions in Tables 5–7 to investigate the robustness of our conclusion that the crisis that started in September 2008 had a permanent contraction effect on both bank the lending to and credit extension of Financing Company NBFCs. POSTCRISIS is the indicator variable equal to one if the current quarter is between December quarter of 2009 and June quarter of 2011, inclusive, and zero otherwise. Our unreported results indicate that the post-crisis indicator is never significant and, therefore, our conclusion is robust to the possibility that the crisis and its influence ended in December 2009.

The second potential concern is that the bank and financial institution-sponsored NBFCs may be driving our conclusions, that is, bank lending to NBFCs is simply an “internal capital-market” reallocation of banks to their NBFC affiliates. There are currently 28 bank and financial institution-sponsored NBFCs in India and 25 of them are in our dataset.<sup>22</sup> As a second robustness check on our results, we re-estimate our models by dropping these 25 NBFCs from our dataset. The resulting data set consists of 232 NBFCs and 2010 NBFC-Quarters. Our unreported results show that our conclusions from the full dataset remain unaltered.

## 6. Conclusions

We study in this paper the determinants of the growth of those non-deposit taking non-bank financial corporations (NBFCs) which are regarded by the Reserve Bank of India as being systemically important and have grown substantially in India over the past decade.

We document that bank lending to these NBFCs forms a significant proportion of their liabilities, and fluctuates in line with bank allocation to priority lending sectors. Bank lending to NBFCs in turn affects their credit growth, so that the recent growth in assets of the NBFCs can be understood as being increasingly financed by funding from banks. Bank lending to these NBFCs also appears to be greater for banks that have lower branching in non-urban areas relative to urban areas. However, this bank-NBFC linkage is virtually non-existent for the largest state-owned bank, the State Bank of India (SBI), and its affiliates, which have a deep rural branching network of their own. Interestingly, these bank-NBFC linkages are present primarily for those NBFCs that do loans or asset financing and not for investment companies. Overall, the findings suggest that NBFCs are seen by banks with less than fully-developed branching networks as a completeness of credit allocation in non-urban areas of the Indian economy, but that this economic role played by the NBFCs has been potentially constrained since Fall 2008 by distortions in bank deposit base arising from a lack of level-playing field in the perceived government support of different banking groups.

Since the NBFCs are relatively well-regulated on the capital front, it is primarily their linkage to the banking sector that stands out as a potential concern for systemic risk considerations. This concern complements the issues regarding potential systemic risk of the NBFCs raised in the Thorat report (2011) relating to their concentration in specific asset markets. Furthermore, our results highlight that shadow banking in emerging markets may look quite different from that in developed economies: well-capitalized, potentially filling in gaps of inadequate intermediation (as explained also in the Indian NBFC summaries by Deosthalee, 2010; Duggal and Kapali, 2012), and affected during crises by the

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<sup>22</sup> This information was available in our dataset.

flight of deposits to state-owned banks in such economies. Micro- and macro-prudential considerations of such shadow banks or non-bank finance companies may not necessarily resemble those in the developed economies, and is a worthy topic for future research. For instance, regulators may wish to remove or at least reduce restrictions on bank branching networks to enable banks to have the reach and specialization of lending in non-urban areas that NBFCs appear to be providing. However, if such restrictions are not removed, then attempts to regulate the credit growth of NBFCs may end up underserving the relatively unbanked parts of the economy even further.

### Appendix I. Prevailing views on shadow banking

The term *shadow banking system* is usually attributed to Paul McCulley of PIMCO, who defined shadow banks as “the whole alphabet soup of levered up non-bank investment conduits, vehicles, and structures” at the Federal Reserve of Kansas City, Jackson Hole Economic Symposium in 2007. However, the origins of the concept may be traced back to a much earlier work of D’Arista and Schlesinger (1993).<sup>23</sup>

Since then, many non-intersecting – but non-contradictory – definitions of the shadow banking system have been offered (see, for example, Acharya and Öncü, 2010; Pozsar et al., 2010; Acharya, 2012; Ghosh et al., 2012 and the like). Some of the key points that emerged are:

- a) Any shadow banking system conducts maturity, credit and liquidity transformation outside the traditional banking system (Pozsar et al., 2010). Thus, not only it is usually less regulated than the traditional banking system or not regulated at all (Acharya and Öncü, 2010), but also there is no explicit access to central bank liquidity or public sector credit guarantees (Pozsar et al., 2010).
- b) Any shadow banking system decomposes the process of credit intermediation into a sequence of discrete operations (Ghosh et al., 2012). Therefore, it can be a collection not only of single financial entities acting independently, but also of (and usually is) networks of multiple financial entities acting together: banks, formal and informal non-bank financial institutions, and even credit rating agencies, regulators and governments (Acharya, 2012).
- c) Any shadow banking system is highly levered. Further, while its assets are risky and illiquid, its liabilities are prone to “bank runs” (Acharya and Öncü, 2010, 2013).

The significance of any shadow banking system is in its potential for creating systemic risk, which “can be defined broadly as the expected losses from the risk that the failure of a significant part of the financial sector leads to a reduction in credit availability with the potential for adversely affecting the real economy (Acharya and Öncü, 2013)”. It is with this concern of systemic risk that we are interested in investigating the growth of shadow banking institutions in emerging markets, in general, and in India, in particular, with a focus on how banking and non-banking institutions are linked and how these linkages affect and help understand the role of the non-banking institutions in the economy.<sup>24</sup>

<sup>23</sup> D’Arista and Schlesinger (1993) called it the *parallel banking system*, and defined it as follows. “Over the last two decades, the U.S. system has been reshaped by the spread of multifunctional financial conglomerates and the emergence of an unregulated parallel banking system. Along with other powerful trends like securitization, these events have broken down the carefully compartmentalized credit and capital marketplace established in New Deal legislation 60 years ago... Today, a variety of unregulated financial intermediaries operate on the fringes of the financial system. Check-cashing and pawn shops offer expensive services to consumers bypassed by mainstream financial firms. Mortgage companies, less regulated than their thrift competitors, constitute a parallel housing finance system. The finance companies obtain their funds from banks as well as from the money market mutual funds (MMMFs) that buy their notes, banks, and commercial papers... Measured in terms of their aggregate assets and the size of individual companies, finance companies rank as the largest single group of unregulated intermediaries. Because of their size and their ability to lend to businesses as well as to household borrowers, finance companies affect credit markets more than do other types of less regulated intermediaries. Finance companies are the most important non-bank intermediaries because they function like banks with virtually no regulatory costs.”

<sup>24</sup> In a recent speech in Mumbai in early 2013, the Reserve Bank of India (RBI) Deputy Governor Anand Sinha observed: “In India, [non-bank financial corporations] NBFCs constitute a major segment of shadow banking system alongside other entities such as Insurance companies and Mutual Funds ...” In the same speech – referring to a Financial Stability Board adopted definition – Sinha defined the *shadow banking system* as “credit intermediation involving entities and activities (fully or partially) outside the regular banking system”. <http://www.bis.org/review/r130204g.pdf>.

## Appendix II. Definition of the variables

This appendix presents definitions of the variables used throughout the paper. All variables are computed based on quarterly data from the June quarter of 2006 to the June quarter of 2011.

Variable	Label	Definition
<i>Panel A: NBFC variables</i>		
Change in Bank Loans/Assets	$\Delta BL/A$	Change in bank loans from previous quarter to the current quarter scaled by previous quarter assets
Change in Total Credit/Assets	$\Delta TC/A$	Change in total credit from previous quarter to the current quarter scaled by previous quarter assets
Investment Company	IC	Indicator variable equal to one if an NBFC is an investment company and zero otherwise
Financing Company	FC	Indicator variable equal to one if an NBFC is a financing company and zero otherwise
Regions	$R_k, k = 1,2,3,4$	Indicator variables equal to one if an NBFC is in region $k$ and zero otherwise where the regions are ordered as East, North, South and West
Size	SIZE	Natural logarithm of previous quarter total assets measured in billions of rupees
Capitalization	CAP	Previous quarter share capital scaled by previous quarter total assets
Liquidity	LIQ	Sum of previous quarter government securities, government guaranteed bonds, cash and bank balances scaled by previous quarter total assets
Non-performing Assets	NPA	Previous quarter gross non-performing assets scaled by previous quarter total credit
<i>Panel B: Economic variables</i>		
Crisis	CRISIS	Indicator variable equal to one if the current quarter is between September quarter of 2008 and June quarter of 2011, inclusive, and zero otherwise
Post-crisis	POSTCRISIS	Indicator variable equal to one if the current quarter is between December quarter of 2009 and June quarter of 2011, inclusive, and zero otherwise
Yield Curve Slope	YCS	Difference between quarterly averages of 10 year and 3 month Indian Government Bond yields from previous quarter
Gross Domestic Product Growth	GDP	Indian gross domestic product growth in the previous quarter
Rate of Inflation	INF	Growth rate of Indian wholesale price index in the previous quarter
<i>Panel C: Bank group variables</i>		
Priority Sector Lending of All Banks	PSLALL	Aggregate priority sector lending of all bank groups
Priority Sector Lending of SBI Group	PSLSBI	Aggregate priority sector lending of SBI and its associates
Priority Sector Lending of Other Bank Groups	PSLOTH	Aggregate priority sector lending of all bank groups except SBI Group
Change in PSLALL/PSLALL	$\Delta PSLALL/PSLALL$	Change in PSLALL from previous quarter to the current quarter scaled by previous quarter PSLALL
Change in PSLSBI/PSLSBI	$\Delta PSLSBI/PSLSBI$	Change in PSLSBI from previous quarter to the current quarter scaled by previous quarter PSLSBI
Change in PSLOTH/PSLOTH	$\Delta PSLOTH/PSLOTH$	Change in PSLOTH from previous quarter to the current quarter scaled by previous quarter PSLOTH
Urban to Rural Bank Branch Ratio of All Banks	RURALL	Ratio of number of urban bank branches number of urban bank branches of all banks
Urban to Rural Bank Branch Ratio of SBI Group	RURSBI	Ratio of number of urban bank branches number of urban bank branches of SBI Group
Urban to Rural Bank Branch Ratio of Other Bank Groups	RUROTH	Ratio of number of urban bank branches number of urban bank branches of all bank groups except SBI Group

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(continued)

Variable	Label	Definition
Change in RURALL	$\Delta$ RURALL	Change in RURALL from previous quarter to the current quarter
Change in RURSBI	$\Delta$ RURSBI	Change in RURSBI from previous quarter to the current quarter
Change in RUROTH	$\Delta$ RUROTH	Change in RUROTH from previous quarter to the current quarter
Term Deposits of All Banks	TDALL	Aggregate term deposits of all banks
Term Deposits of SBI Group	TDSBI	Aggregate term deposits of SBI Group
Term Deposits of Other Bank Groups	TDOTH	Aggregate term deposits of all bank groups except SBI Group
Change in TDALL/TDALL	$\Delta$ TDALL/TDALL	Change in TDALL from previous quarter to the current quarter scaled by previous quarter TDALL
Change in TDSBI/TDSBI	$\Delta$ TDSBI/TDSBI	Change in TDSBI from previous quarter to the current quarter scaled by previous quarter TDSBI
Change in TDOTH/TDOTH	$\Delta$ TDOTH/TDOTH	Change in TDOTH from previous quarter to the current quarter scaled by previous quarter TDOTH

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