The Growth of a Shadow Banking System in Emerging Markets: Evidence from India

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Abstract

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 these NBFCs forms a significant proportion of their liabilities, and fluctuates in line with bank allocation to priority lending sectors. Bank lending to these NBFCs also appears to be greater for banks that have lower branching in semi-urban areas relative to metropolitan areas. However, bank lending to these NBFCs is virtually non-existent for the largest state-owned bank, State Bank of India (SBI), and its affiliates. Starting with the financial crisis of Fall 2008, bank lending to these NBFCs experienced a permanent contraction shock that is related to the shift of term deposits towards SBI away from other banks. These bank-NBFC linkages are present primarily for those NBFCs that do loans or asset financing and not for investment companies, and also affect the credit growth of these NBFCs. Overall, the findings suggest that NBFCs represent a completeness of credit allocation in non-metropolitan areas of the Indian economy by banks with less than fully-developed branching networks, but that this role has been potentially constrained by distortions in bank deposit base arising from a lack of level-playing field in the perceived government support of different banking groups.

Summary of the Paper

1. Motivation

We investigate the rapid growth of the non-bank finance corporations (NBFCs) in India as a laboratory to understand incentives underlying the growth of *shadow banking* institutions in emerging markets. 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). 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.*
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> *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.*
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> *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 nonbank intermediaries because they function like banks with virtually no regulatory costs."*

Since then, many non-intersecting – but non-contradictory – definitions of the shadow banking system have been offered (see, for example, Acharya and Öncü, 2010, Adrian et al, 2010, Acharya, 2011, Gosh 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* (Adrian 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 (Adrian et al, 2010).

b) *Any shadow banking system decomposes the process of credit intermediation into a sequence of discrete operations* (Gosh 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, 2011).

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, if there are any.

India has a very 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[1], Chit Funds[2], Badla Financiers[3], Commodity Trade Financiers, Gold Saving Companies, Gold Loan Companies, Pawn Brokers, 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.

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 Indian NBFCs, Sundaram Finance, was incorporated in 1954 with the objective of financing the purchase of commercial vehicles and passenger cars.[4] Since most, if not all, of the early Indian NBFCs mobilized deposits to fund their financing, they were

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[1] 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.

[2] Same as Nidhis, except that their members or shareholders are individuals only.

[3] Stock Trade Financiers

[4] http://www.sundaramfinance.in/companyinfo/history.aspx

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 (Nizar 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, Nizar 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 7,855 in March 1999 from 55,995 in March 1995 (Nizar and Aziz, 2004). For the deposit taking NBFCs, the number of companies dropped from 1,429 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. The table below 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.

Comparison of Bank and Deposit Taking NBFC Deposits

	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%**

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 with asset size of 1 billion rupees. Figures 8 and 9 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, whereas the table below summarizes the consolidated balance sheet of the deposit taking and systemically important non-deposit taking NBFCs for the fiscal years 2006, 2010 and 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.

Consolidated Balance Sheet of NBFCs (Trillions of Rupees)

	2006	%2006	2010	%2010	2011	%2011
Liabilities						
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%**
Assets						
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%**

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, the Indian NBFCs are tightly regulated unlike the typical shadow banks in other parts of the world. 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 inter-twined.

2 NBFC and Bank Types

As of writing (December, 2012), the deposit taking and non-deposit taking NBFCs are classified into the following seven categories by function:[5]

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.

Our systemically important non-deposit taking NBFC data set contains all of the above types except the Core Investment Companies. Since the main business of all of the types of NBFCs from type 3 to type 7 is extending credit, we lump them into a super-category that we call the "Finance Companies". Therefore, our systemically important non-deposit taking NBFC data set comprises two NBFC types:

1) Investment Companies;
2) Finance Companies.

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.

Figure 1 plots the aggregate total assets of the above bank groups from March 2006 to June 2012, and shows that the Nationalized Bank Group is the largest bank group by assets, followed by the SBI Group, New Private Bank Group, Foreign Bank Group and Old Private Bank Group, 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 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

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[5] Definitions are given in Appendix II.

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[6] lending requirement is 40% for domestic banks and 32% for foreign banks of their adjusted net credit[7] as of December 2012.

3 Empirical Design and Hypotheses

The generic equation we estimate to obtain our results is as follows:

$$y_{it} = \alpha x_{it} + \beta z_t + u_i + e_{it}$$

where y_{it} is the NBFC specific dependent variable for the ith NBFC in the tth quarter, x_{it} is the vector of NBFC specific explanatory variables for the ith NBFC in the tth quarter, z_t is the vector of bank group-wise and economic explanatory variables in the tth quarter, u_i is the random effect variable for the ith NBFC and e_{it} is the error term. Both u_i and e_{it} are identically and independently distributed normal variables, except that for each NBFC i, they are correlated, and the correlation coefficient is constant. We employ the Simulated Maximum Likelihood Estimation (SMLE) approach and report the Observed Information Matrix standard errors.

We use five data sets for our empirical analysis: NBFC-level balance sheet and non-performing asset data on systemically important non-deposit taking NBFCs, bank group-level balance sheet data on bank groups, bank group-level priority sector lending data on bank groups, bank group-level bank branch data on bank groups and economic data on Indian 3 month and 10 year yields, gross domestic product and wholesale price index. We collect NBFC and bank group data from the Reserve Bank of India whereas we collect economic data from the Economic and Political Weekly Research Database. While the last two data sets are available from public sources, the first three data sets are private.

From these five data sets, we construct a quarterly data set of the variables we defined in Appendix I. Our observation period runs from the June quarter of 2006 to the June quarter of 2011. The bank group and economic variables are available for each of the quarters. For the NBFC level variables, we use the following sample selection criteria:

1) In each quarter, there is no missing/erroneous balance sheet data;

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[6] Indian Priority Sectors are defined in Appendix III.
[7] 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.

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 sample selection criteria, we construct an imbalanced panel data set of 257 NBFCs and 2374 NBFC-quarters from an initial imbalanced panel data set of 383 NBFCs and 3629 NBFC-quarters. Summary statistics of the data are given in Table I.

Recall from the previous subsection that our data set consists of Investment Company and Finance Company systemically important, non-deposit taking NBFCs. While the main business of Finance Company NBFCs is extending credit, the main business of Investment Company NBFCs is the acquisition of securities. Indeed, Figure 12 shows for our data set that while the credit extended by Finance 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, Figure 11 shows for our data set that while Finance 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.[8]

The significance of the above 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. 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*

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[8] Indeed, since banks loans are an important source of funds of the systemically important non-deposit taking NBFCs – particularly of the Finance 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.

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."

What the former RBI Deputy Governor Usha Thorat describes above appears to be a
"shadow bank run" on the NBFCs, resulting from a "run" on the private sector banks
(transmitted to the NBFCs through bank loans) and mutual funds[9] (transmitted to
the NBFCs through commercial paper).

As Figure 6 shows, a massive term deposit migration from the private banks
(mainly from the New Private Bank Group) to the public banks (mainly to the SBI
Group) started in the summer of 2008. As seen in Figure 11, this corresponds with
the withdrawal of banks loans from the NBFCs. Furthermore, Figure 3 shows that
this withdrawal of bank loans from the NBFCs corresponds with a massive
contraction in bank lending to the priority sector 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[10],
declassifying such loans from priority sector lending.

Our last observation is from Figure 2: the SBI Group has the largest semi-
urban presence relative to metropolitan presence, although the Old Private Bank
Group has caught up the SBI Group in recent years. The significance of this is that
much of the priority sector lending takes place in the semi-urban areas.
Furthermore, much of the NBFC lending takes place in semi-urban areas. Therefore,
banks that have lower branching in semi-urban areas relative to metropolitan 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).

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[9] Aziz, Patnaik and Shah (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."
[10] Two months before the end of our observation period.

Motivated by these observations, we ask the following questions:

1) Does bank lending to the priority sectors influence bank lending to the NBFCS and, in turn, how does NBFC lending itself gets affected?
2) Does bank branch presence in semi-urban areas relative to metropolitan 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) Do Investment Company and Finance Company NBFCs get influenced similarly by the above three channels or differentially?
5) 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?
6) Did the crisis influence Investment Company and Finance Company NBFCs similarly?

In conjunction with all of the above, we are interested also in looking at how bank lending to the NBFCs differs among the bank types. Had we known the direct lending linkages between the banks and NBFCs at the institution level, this question could have been addressed easily. In 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 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 lending itself.

3 Results

To address the above questions, the dependent bank lending to NBFC and NBFC lending variables we use are 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 NBFC random-effect Maximum Likelihood regression results in Tables II through VII. In all of the regressions, we use the NBFC size, capitalization, liquidity and non-performing asset variables as NBFC specific, and yield curve slope, GDP growth and inflation variables as economy specific control variables. All variables are defined in Appendix I.

In Table II, Panels A and B we look at the first and fourth questions. The results indicate that an increase in priority sector lending of the entire banking sector increases bank lending to the NBFCs and decreases the NBFC lending itself. Similarly, an increase in priority sector lending of the Other Bank Groups has the same effect on bank lending to the NBFCs and the NBFC lending itself. On the other hand, the priority sector lending of the SBI Group has no effect either on the bank lending to the NBFC or on the NBFC lending itself. When we separate the NBFCs according to their types, we see that the same conclusions hold true for Finance

Company NBFCs whereas bank lending to the priority sector has no effect on the Investment Company NBFCs.

In Table III, Panels A and B we look at the second and fourth questions. Looking at Panel A, one gets the impression that while neither the sector level nor Other Bank Groups semi-urban to metropolitan bank branch ratio has any influence on the bank lending to the NBFCs, the higher is the SBI Group semi-urban to metropolitan bank branch ratio, the lower is the bank lending to the NBFCs. When we look at the NBFC lending itself, the impression is that the roles are reversed: the SBI Group semi-urban to metropolitan bank branch ratio has no effect on the NBFC lending itself whereas the higher is the sector level or Other Bank Groups semi-urban to metropolitan bank branch ratio, the lower is the NBFC lending itself. When we separate the NBFCs according to their types in Panel B, the picture changes entirely: although, as expected, none of the bank branch ratios has any influence on Investment Company NBFC, the Other Bank Groups and entire sector bank branch ratios influence Finance Company NBFCs, but the SBI Group bank branch ratio has no influence. The results indicate that higher semi-urban presence relative to metropolitan presence of the Other Bank Groups, as well as the entire sector, reduces both the bank lending to the NBFC and the NBFC lending itself. Since the models in Panel A are restricted forms of and nested in the corresponding models in Panel B, Likelihood Ratio tests indicate that the restrictions are rejected at 1% level and the results of Panel B are valid.

In Table IV, Panels A and B we look at the third and fourth questions. In view of our discussion above (that is, restrictions are rejected at 1%), we will look at the results in Panel B only. Results in Panel B indicate that term deposit build up has no influence on Investment Company NBFCs at all, as expected. Similarly, term deposit build up has no influence on Finance Company NBFC lending, either. For bank lending to Finance Company NBFCs, however, deposit build up at the SBI Groups decreases bank lending to the NBFC whereas deposit build up at neither the Other Bank Groups nor the entire sector has any influence (Columns (2) and (3) are restricted forms of and nested in Column (4), and Likelihood Ratio tests indicate that the restrictions are rejected at 1% level and the results of Column (4) are valid).

Tables V, VI and VII extend the analysis in Tables II, III and VI, respectively, to answer the fifth and sixth questions. Recall that CRISIS appearing in these regression is the indicator variable equal to one if the current quarter is between September quarter of 2008 and June quarter of 2011, inclusive, and zero otherwise. For the reason given in the above paragraph, again, we look at the results in Panel B in each of the Tables only. In addition, the models in Tables II, III and VI are restricted forms of and nested in the corresponding models in Tables V, VI and VII, respectively. Based on Likelihood Ratio tests, we see again that the restrictions in Tables II, III and VI are rejected at 1% level, indication the following: while the crisis had no permanent effect on Investment Company NBFCs, starting with the crisis in September 2008, Finance Company NBFCs experienced a permanent contraction shock to both the bank lending to and credit extension of the NBFCs. This result is invariant among all of Tables V, VI and VII.

Tables V and VII show also that our conclusions from results in Table II and Table VI regarding the influence priority sector lending of and term deposit build up at the banks on bank the lending to and credit extension of the NBFCs remain robust. The results in Table VI regarding the influence of semi-urban to metropolitan bank branch ratio are somewhat mixed. However, when we re-estimate the models in Table VI by restricting the parameters of the bank ratio variables to zero, we are unable to reject the restrictions for seven of the eight columns, indicating that bank branch variables do not add much beyond and above the effect of the crisis.

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 V, VI and VII 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 Finance 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 although at times the post-crisis indicator is significant, either its sign is same as the crisis indicator or there is a better model where it becomes insignificant. Consequently, our conclusion is robust to the possibility that the crisis and its influence ended in December 2009.

The second concern is that the bank and financial institution sponsored NBFCs may drive our conclusions. There are currently 28 bank and financial institution sponsored NBFCs in India and 25 of them are in our data set. As a second robustness check on our results, we re-estimate our models by dropping these 25 NBFCs from our data set. The resulting data set consist of 232 NBFCs and 2010 NBFC-quarters. Our unreported results show that our conclusions from the full data set remain unaltered.

4 Conclusions

In summary, 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 these NBFCs also appears to be greater for banks that have lower branching in semi-urban areas relative to metropolitan areas. However, bank lending to these NBFCs is virtually non-existent for the largest state-owned bank, State Bank of India (SBI), and its affiliates. Starting with the financial crisis of Fall 2008, bank lending to these NBFCs experienced a permanent contraction shock that is related to the shift of term deposits towards SBI away from other banks. These bank-NBFC linkages are present primarily for those NBFCs that do loans or asset financing and not for investment companies, and also affect the credit growth of these NBFCs.

Overall, the findings suggest that NBFCs represent a completeness of credit allocation in non-metropolitan areas of the Indian economy by banks with less than fully-developed branching networks, but that this role has been potentially constrained by distortions in bank deposit base arising from a lack of level-playing field in the perceived government support of different banking groups. Since these 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. 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, and affected during crises by the 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.
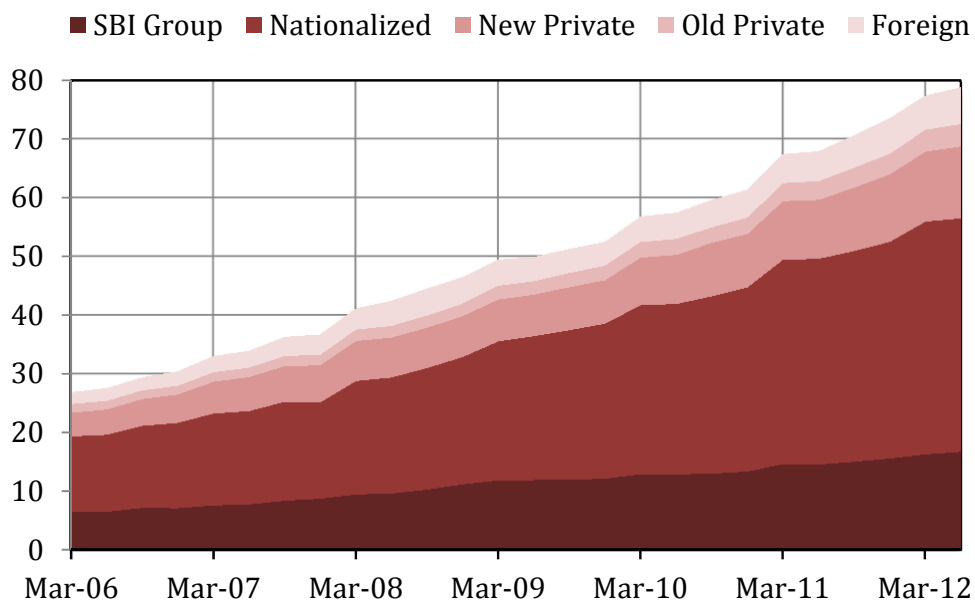
Figure 1: Bank Groups by Assets (Trillions of Rupees). Figure 1 plots the aggregate total assets of the SBI Group (6 banks), Nationalized Banks (20 banks), New Private Banks (7 banks), Old Private Banks (14 banks) and Foreign Banks (36 banks). The figure shows that the Nationalized Bank Group is the largest bank group by assets, followed by the SBI Group, New Private Bank Group, Foreign Bank Group and Old Private Bank Group, in that order.
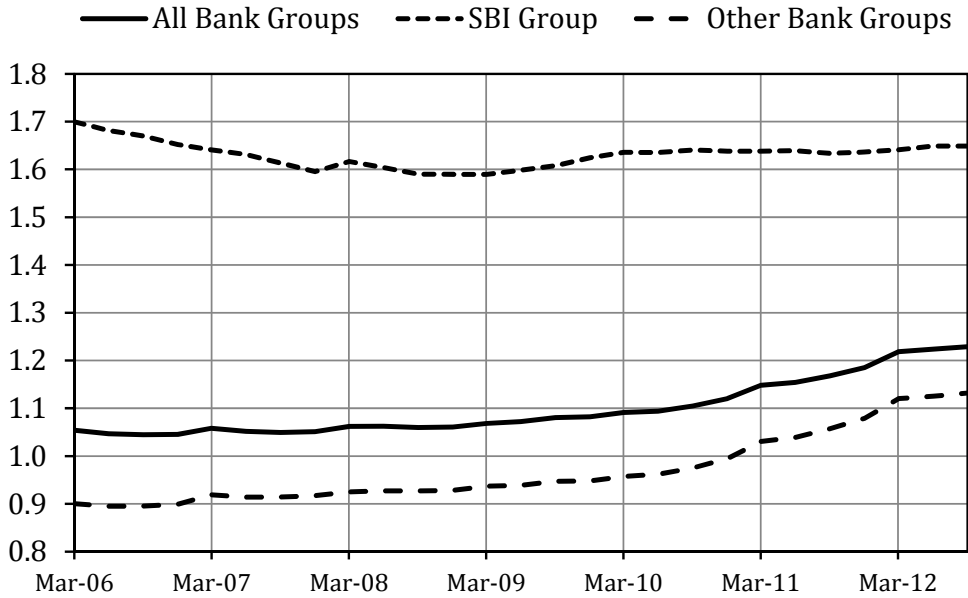
2.a) SBI Group and Other Bank Groups
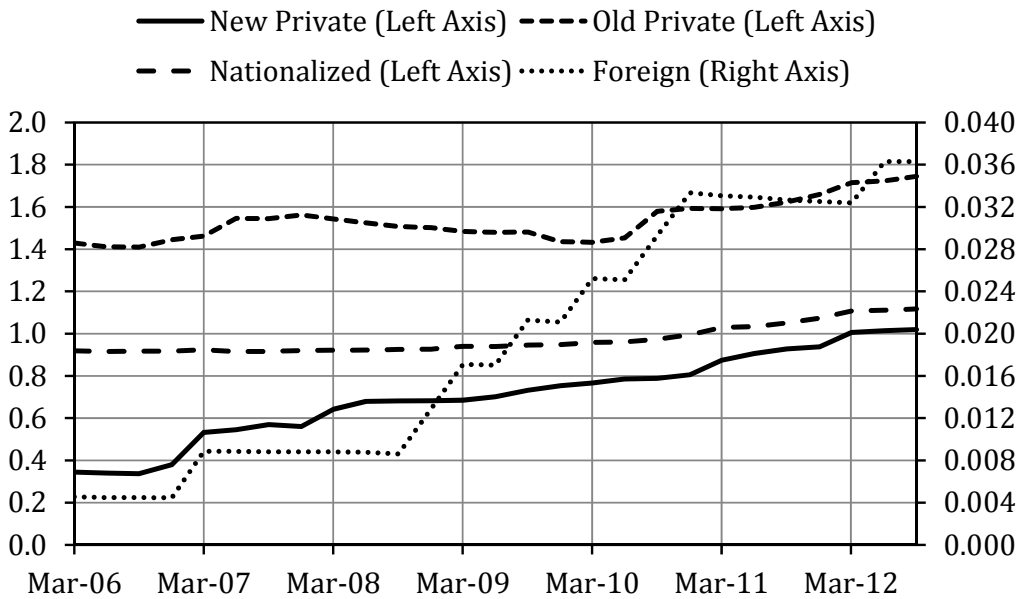
2.b) Members of Other Bank Groups

Figure 2: Ratio of Number of Semi-Urban Bank Branches to Number of Metropolitan Bank Branches. Figure 2 compares the semi-urban bank branch presence of the Indian bank groups relative to their metropolitan bank branch presence. The SBI Group has the largest semi-urban presence relative to metropolitan presence, although Old Private Bank Group has caught up the SBI Group in recent years. The Nationalized Bank Group, New Private Bank Group and Foreign Bank Group follow them, in that order. The figure shows also that non-metropolitan presence of the foreign banks is virtually nonexistent.

15
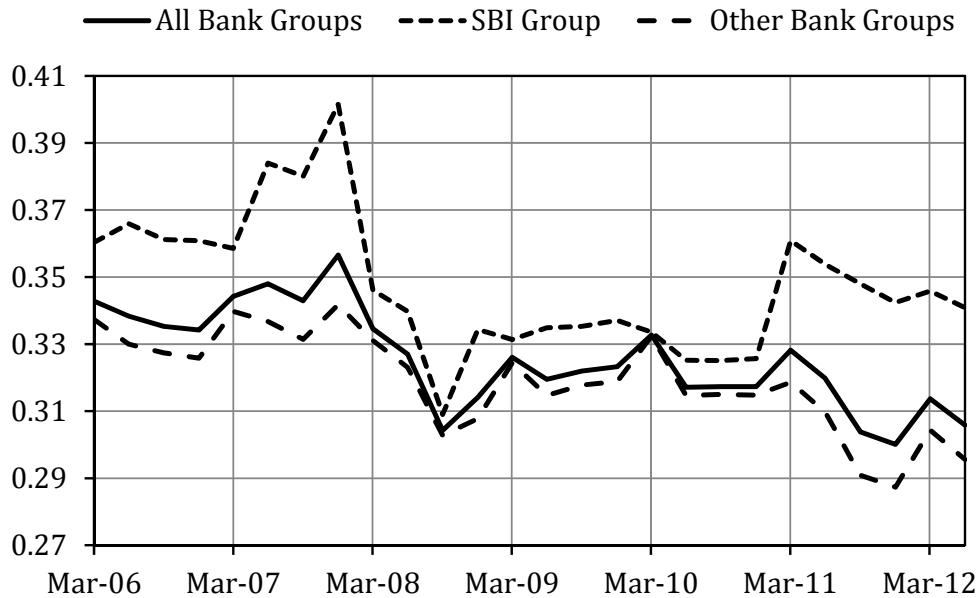
3.a) SBI Group and Other Bank Groups
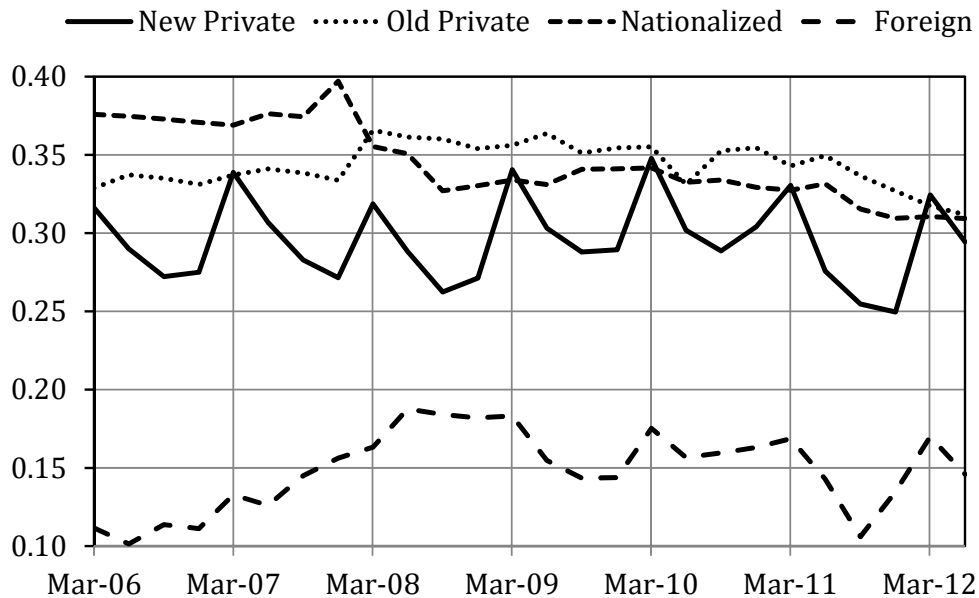
3.b) Members of Other Bank Groups

Figure 3: Bank Priority Sector Lending as percentage of Bank Credit. Figure 3 plots the per total credit priority sector lending of the bank groups in India. The priority sector lending target of the domestic banks is 40% of their adjusted net credit (see: www.rbi.org.in for definition) and 32 percent 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.
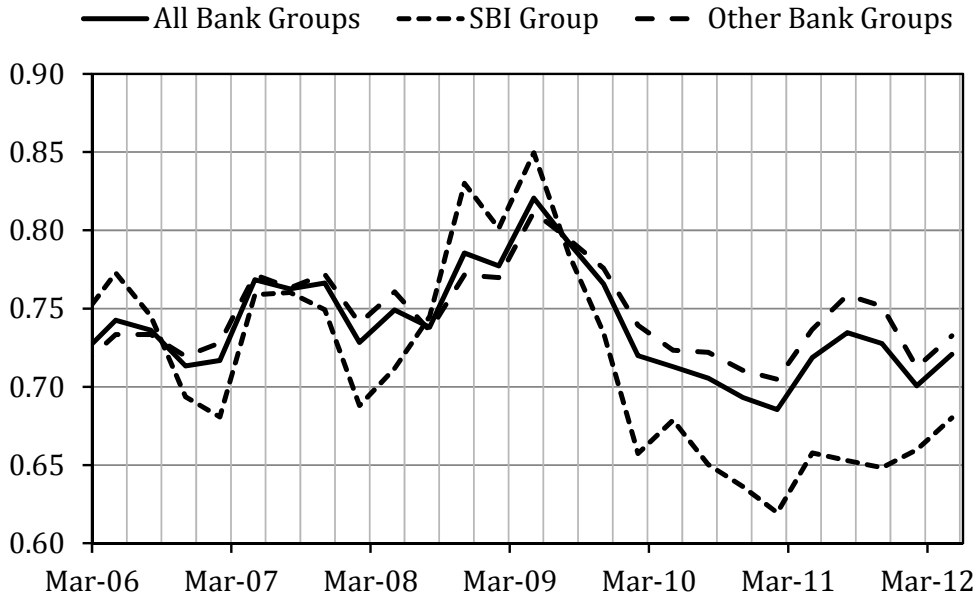
4.a) Term Deposits
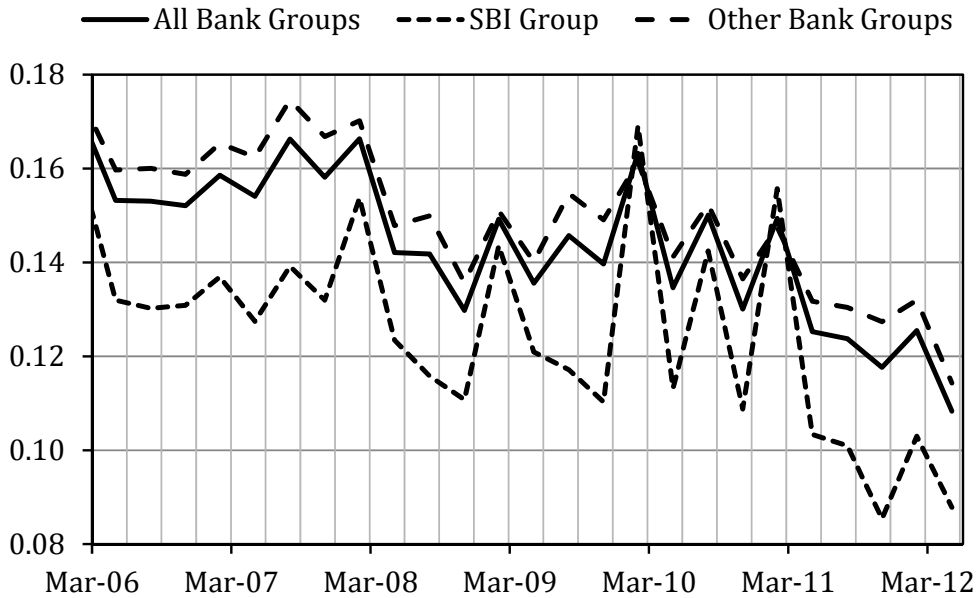
4.b) Demand Deposits

Figure 4: Bank Retail Deposits as percentage of Total Credit. Figure 3 plots the per total credit retail demand and term deposits at banks in India. The figure shows that term deposits shifted to the SBI Group during the Fall 2008 crisis for a period of about one year and then returned to other banks groups in the fall of 2009. It shows also that there is a decreasing trend in demand deposits indicating a maturity transformation from demand deposits to term deposits.
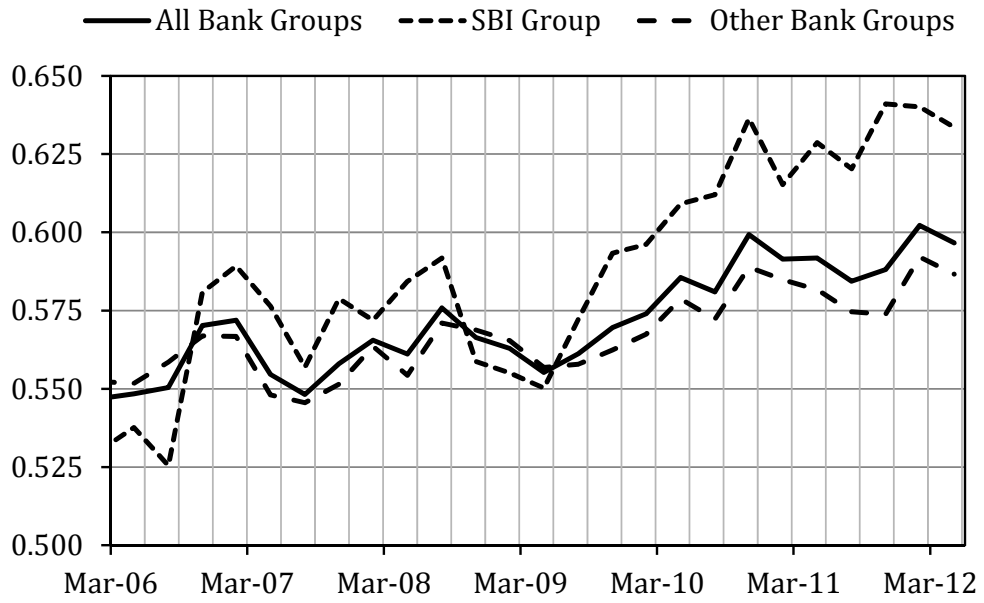
Figure 5: Bank Total Credit as percentage of Total Assets. Figure 5 plots the total credit per total assets of the SBI Group and other banks groups. It depicts that the SBI Group credit extension has accelerated relative to the other bank groups since the summer of 2009.
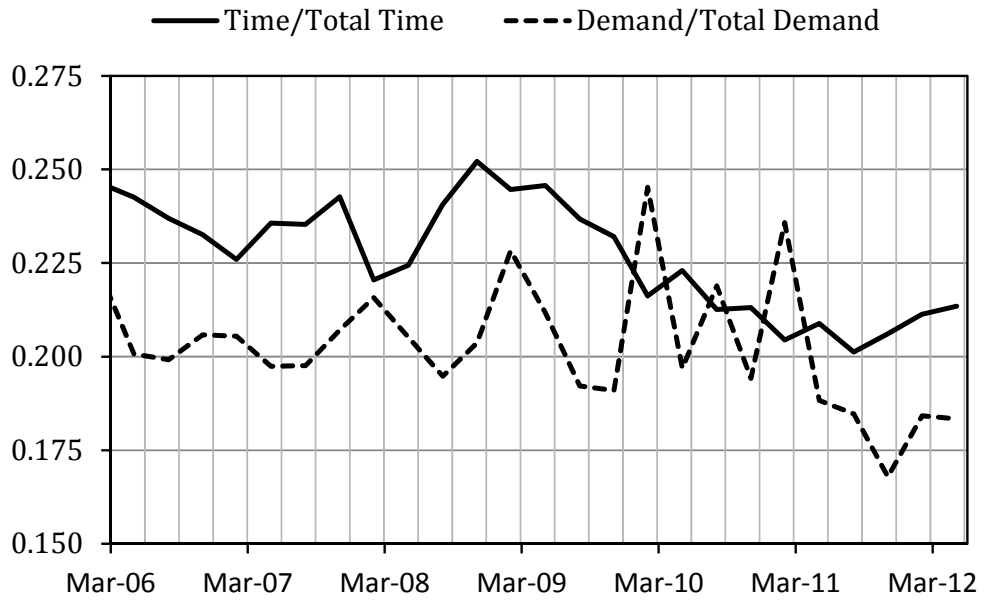
6.a) SBI Group
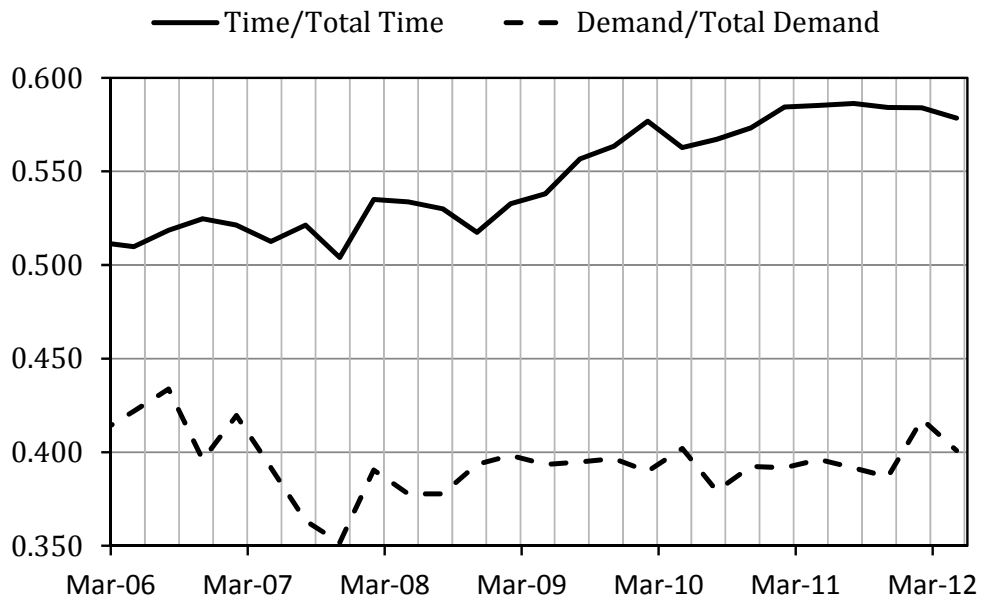
6.b) Nationalized Banks
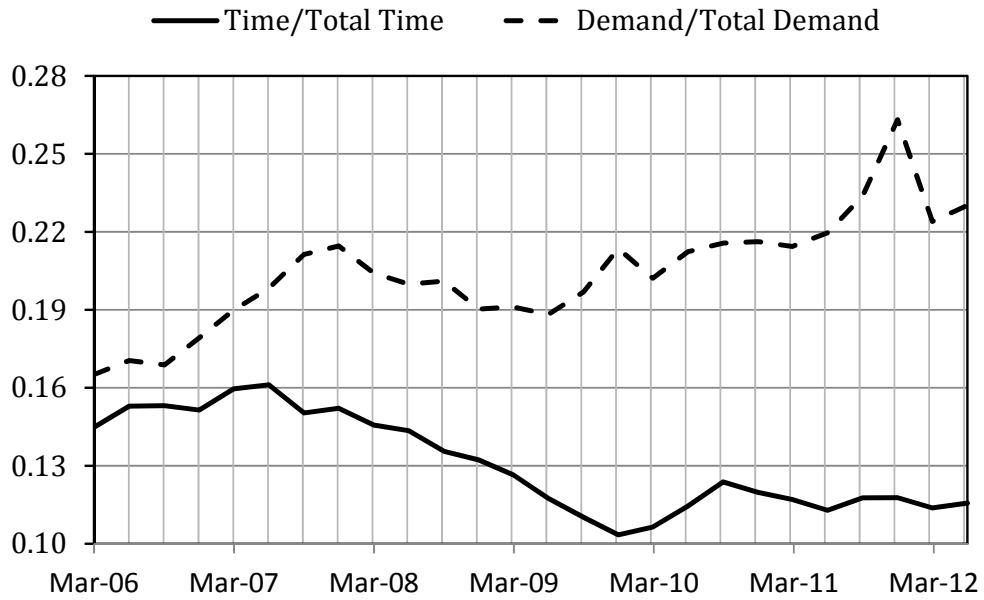
6.c) New Private Banks
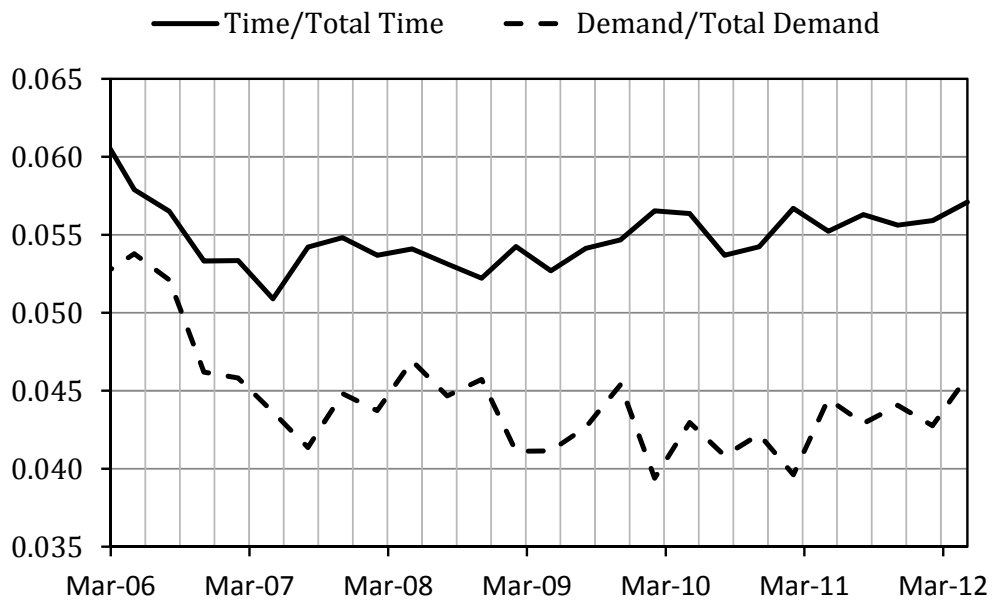
6.d) Old Private Banks
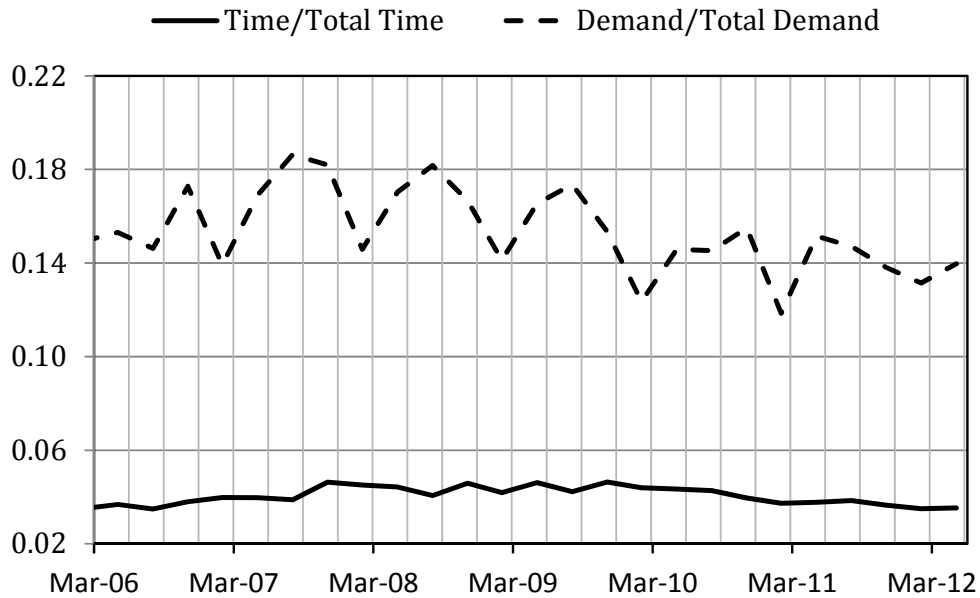
6.e) Foreign Banks

Figure 6: Bank Deposits as percentage of Aggregate Bank Deposits (Sectoral Migration). Figure 6 plots the time and demand deposit shares of each of the banks groups in India. The figure shows that during the Fall 2008 crisis term deposits migrated from other bank groups (mainly from the New Private Banks) to the SBI Group for about a year. 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.
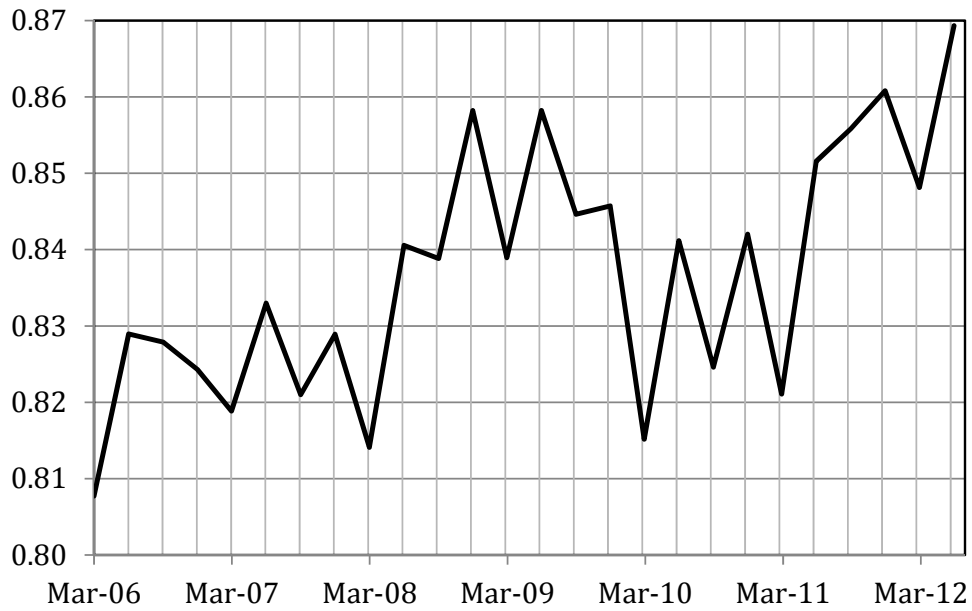
Figure 7: Aggregate Term Deposits of Banks as percentage of Aggregate Demand and Term Deposits (Maturity Transformation – All Banks). Figure 7 plots the share of term deposits in the sum of retail demand and times deposits of all banks. It depicts the maturity transformation from demand deposits to term deposits during the crisis of Fall 2008, which again gained speed after the March quarter of 2011.

8.a) All NBFCs

■ Deposit Taking   ■ Systemically Important Non-deposit Taking
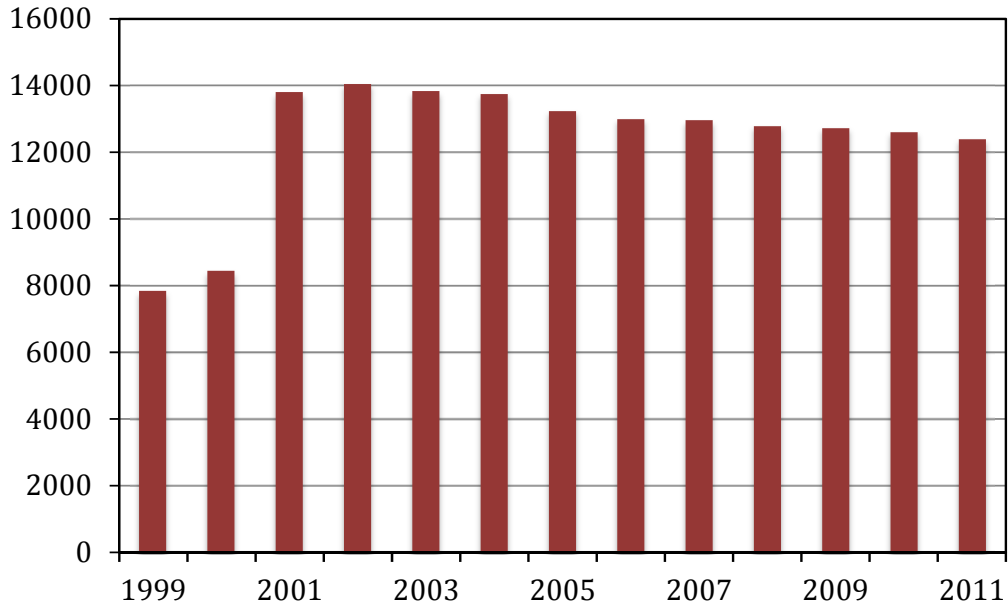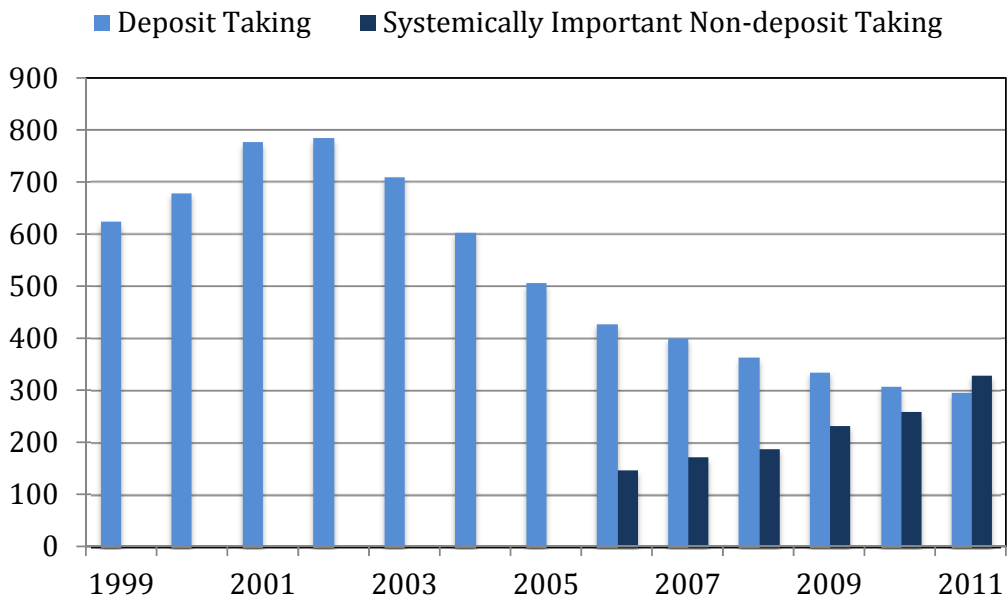
8.b) Deposit Taking and Systemically Important Non-deposit Taking NBFCs
Figure 8: Growth of the NBFC Sector by Number of NBFCs. Figure 8 plots the time evolution of the number of NBFCs since 1999. The massive increase in the number of NBFCs in 2001 coincides with the scandals in the NBFC sector, which 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.

23
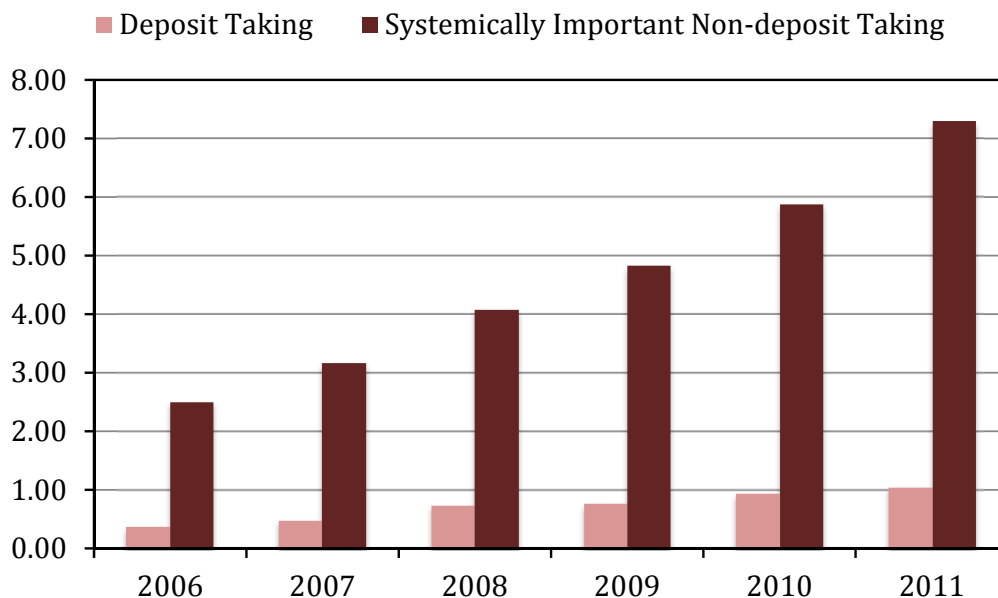
9.a) Assets in Trillions of Rupees
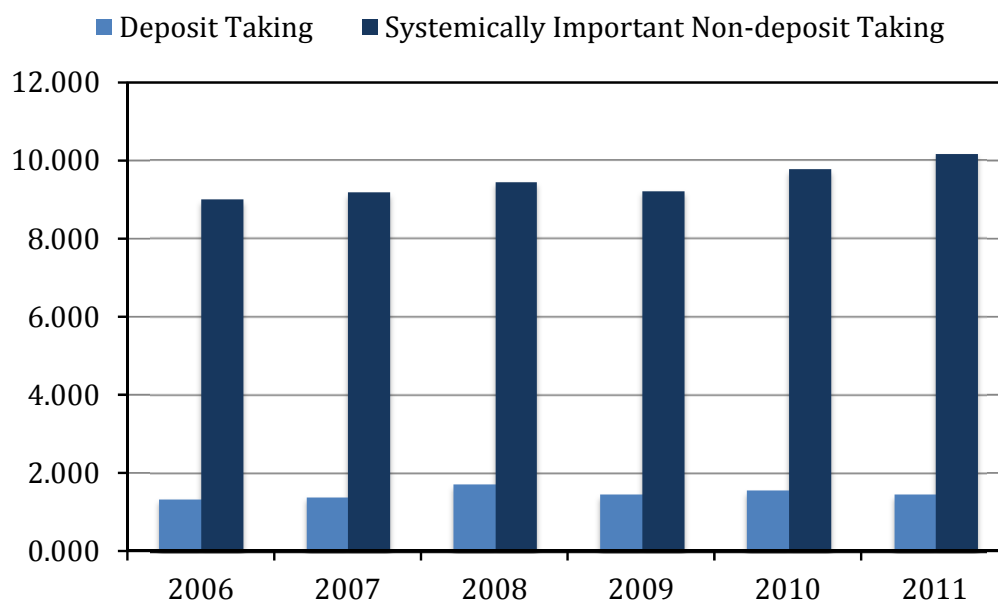
9.b) Assets as Percentage of Bank Assets

Figure 9: Growth of the NBFC Sector by Assets. Figure 9 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.
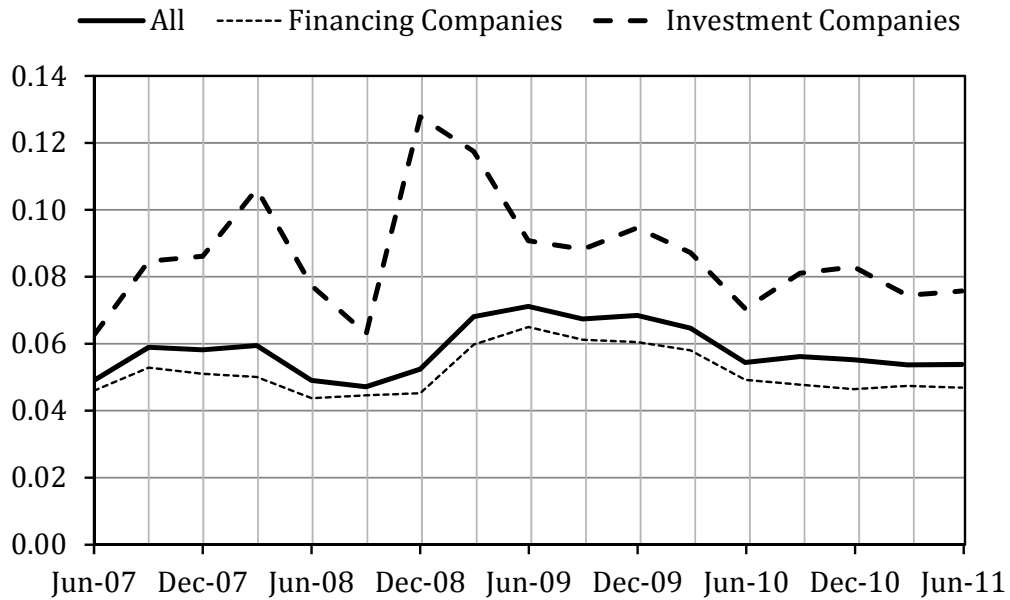
Figure 10: Capitalization of Systemically Important Non-deposit Taking NBFCs.
Figure 10 plots the capitalization of systemically important non-deposit taking NBFCs. We define capitalization as the ratio of share capital to total assets. The figure compares the Investment Company and Financing Company NBFCs, and shows that the Investment Company NBFCs are better capitalized then the Financing Company NBFCs. The figure depicts the effect of Fall 2008 crisis on the capitalization of systemically important non-deposit taking NBFCs, as well as the recapitalizations that followed.
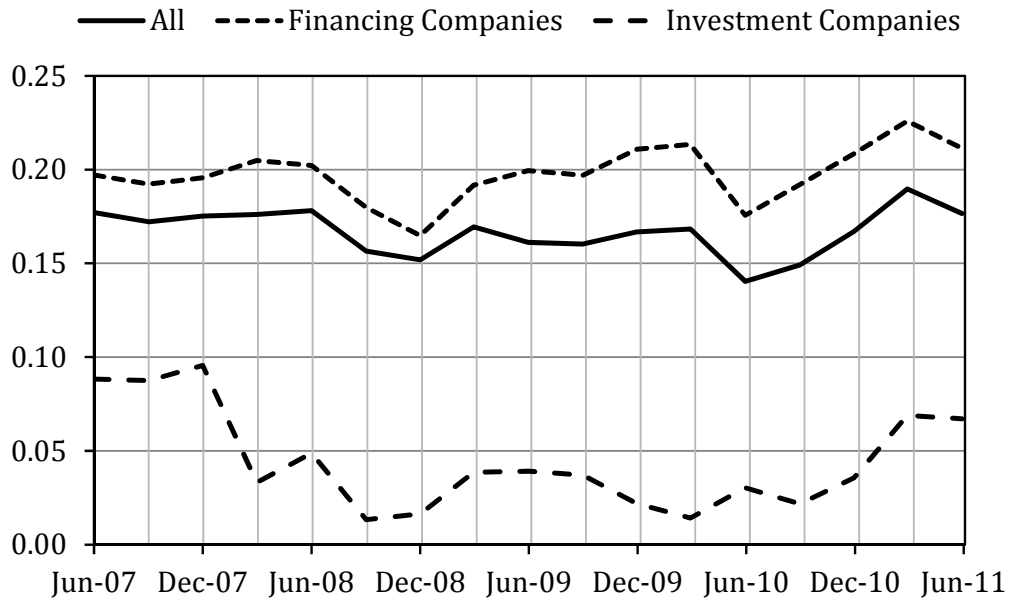
11.a) Bank Loans
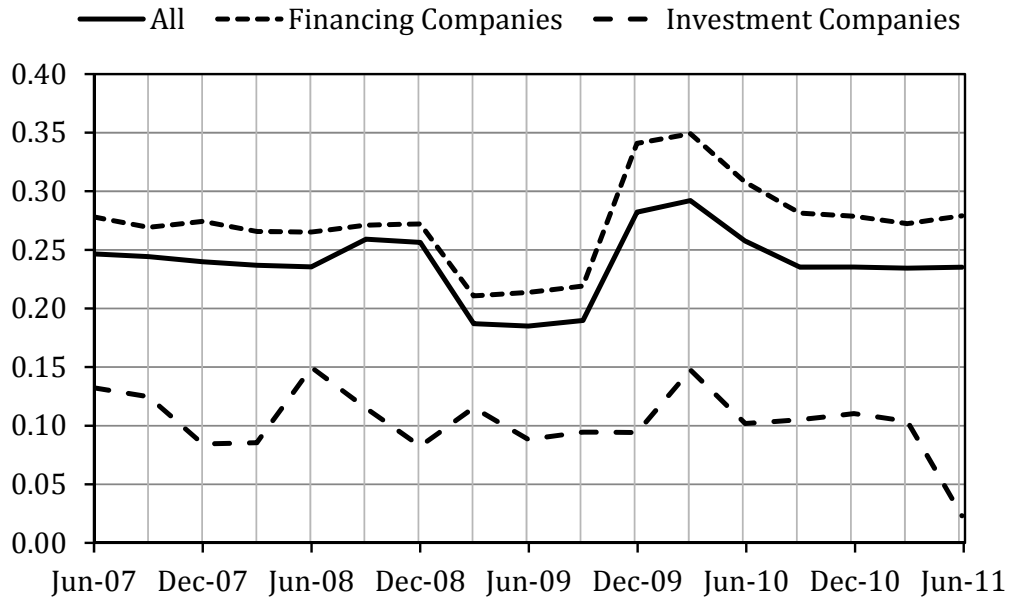
11.b) Debentures
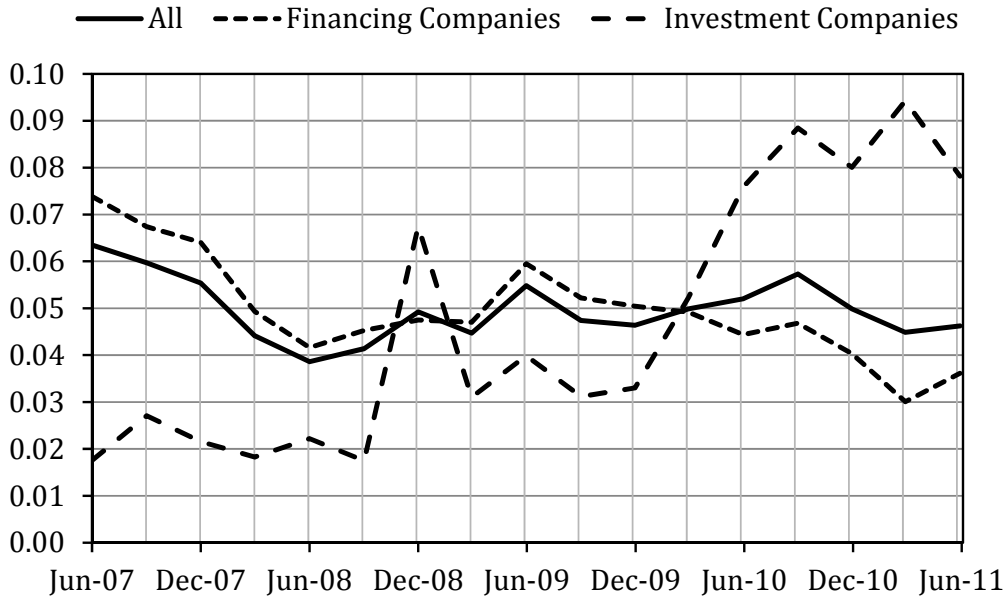
11.c) Commercial Paper
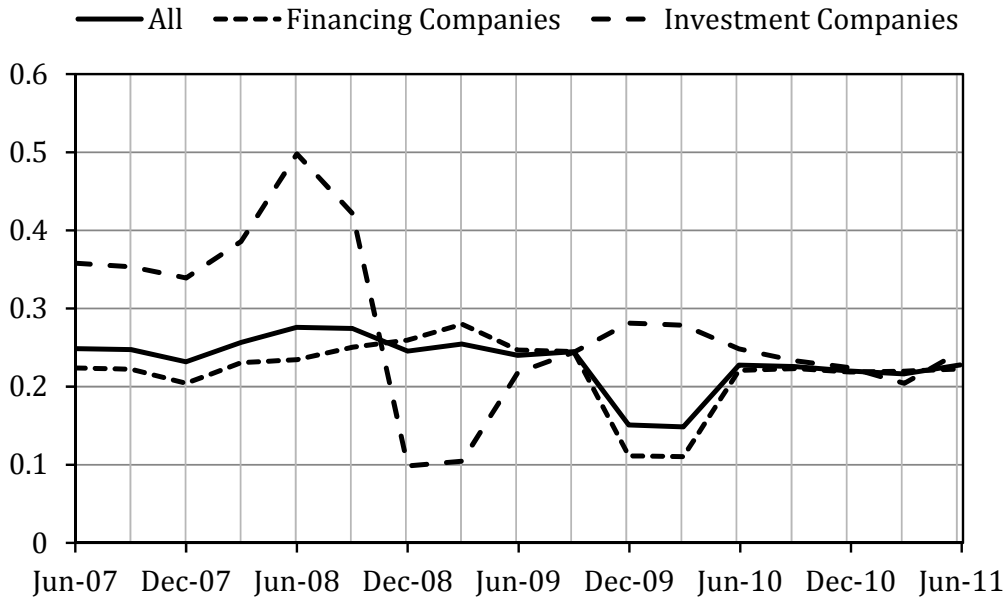
11.d) Other Debt

Figure 11: Debt Growth of Systemically Important Non-deposit Taking NBFCs (Debt per Assets). The figure plots the evolution of the debt structure of the systemically important non-deposit taking NBFCs. It shows that the Financing Company NBFCs are heavily debt financed relative to the Investment Company NBFCs. The Financing Company NBFCs are also more reliant on the bank loans than the Investment Company NBFCs. The figure depicts the effect of Fall 2008 crisis on the ability of the systemically important non-deposit taking NBFCs to borrow from the banks and the debt market, and shows that the Financing Company NBFCs increased their debenture issuance in the debt market after the crisis.
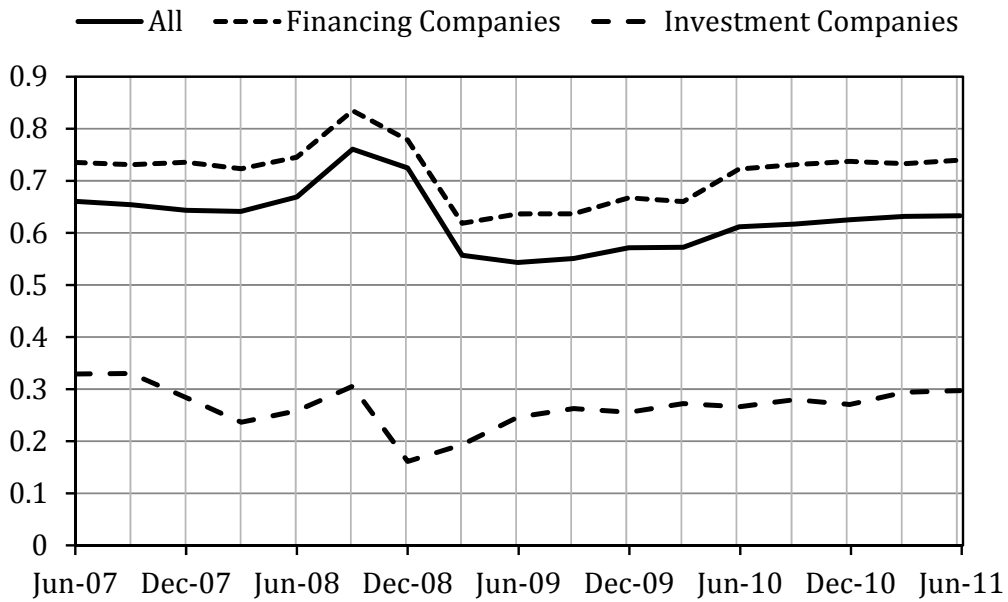
Figure 12: Credit Growth of Systemically Important Non-deposit Taking NBFCs (Credit per Assets). The figure plots the evolution of the credit extension of systemically important non-deposit taking NBFCs as percentage of assets. The figure shows that the systemically important non-deposit taking NBFCs reduced their lending during the Fall 2008 crisis substantially.
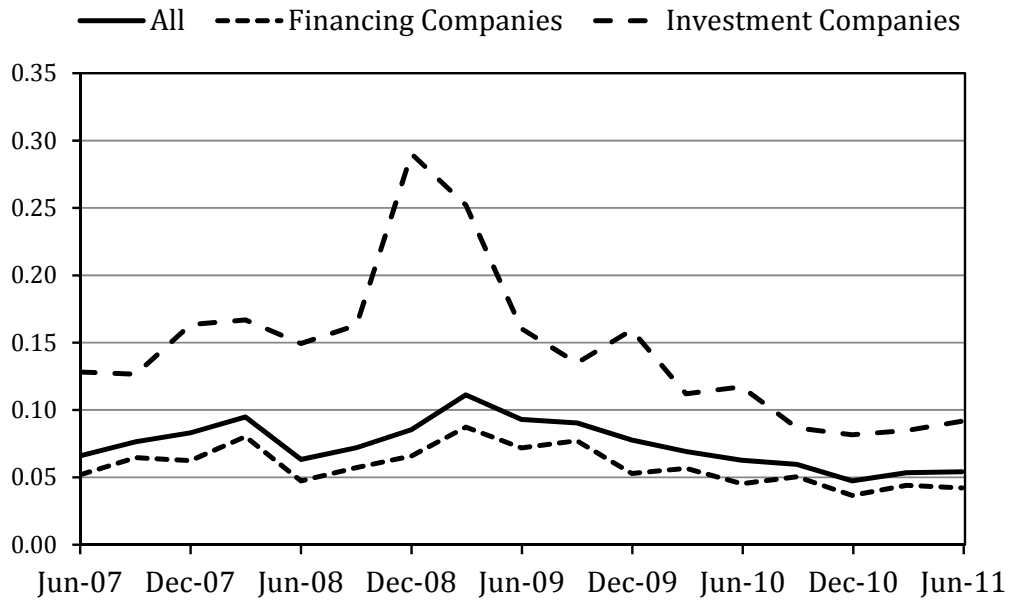
Figure 13: Liquidity of Systemically Important Non-deposit Taking NBFCs. Figure 13 plots the liquidity of systemically important non-deposit taking NBFCs. We define liquidity as the ratio of the sum of government securities, cash and bank balances to total assets. The figure shows that although the liquidity of both types of systemically important non-deposit taking NBFCs had gone up significantly during the Fall 2008 crisis, the liquidity growth of the Investment Company NBFCs had been substantial.

TABLE I

Summary Statistics

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

	Mean	St. Dev.	Min	Max
Panel A: NBFC Variables				
	(1)	(2)	(3)	(4)
ΔBL/A	0.013	(0.092)	-0.631	1.237
ΔTC/A	0.035	(0.172)	-0.977	3.031
SIZE	2.370	(1.237)	-0.440	6.973
LEV	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

	Mean
Panel B: Indicator Variables	
	(1)
IC	0.516
FC	0.484
CRISIS	0.748

	Mean	St. Dev	Min	Max
Panel C: Economic Variables				
	(1)	(2)	(3)	(4)
YCS	0.021	(0.013)	0.001	0.041
GDP	0.083	(0.012)	0.058	0.100
INF	0.066	(0.033)	0.005	0.110

Panel D: Priority Sector Lending Variables						
	Mean	St. Dev.	Min	Max	Correlations		
	(1)	(2)	(3)	(4)	ΔPSLALL/PSLALL	ΔPSLSBI/PSLALL	ΔPSLOTH/PSLALL
ΔPSLALL/PSLALL	0.046	(0.048)	-0.025	0.122	1		
ΔPSLSBI/PSLALL	0.011	(0.014)	-0.022	0.041	0.611	1	
ΔPSLOTH/PSLALL	0.034	(0.041)	-0.026	0.108	0.962	0.373	1

Panel E: Bank Branching Variables						
	Mean	St. Dev.	Min	Max	Correlations		
	(1)	(2)	(3)	(4)	SU/M-ALL	SU/M-SBI	SU/M-OTH
SU/M-ALL	1.090	(0.034)	1.045	1.155	1		
SU/M-SBI	1.624	(0.021)	1.59	1.681	0.448	1	
SU/M-OTH	0.959	(0.041)	0.895	1.039	0.997	0.388	1

Panel F: Term Deposit Variables						
	Mean	St. Dev.	Min	Max	Correlations		
	(1)	(2)	(3)	(4)	ΔTDLALL/TDALL	ΔTDSBI/TDSBI	ΔTDOTH/TDOTH
ΔTDLALL/TDALL	0.044	(0.025)	0.002	0.094	1		
ΔTDSBI/TDSBI	0.033	(0.050)	-0.045	0.144	0.609	1	
ΔTDOTH/TDOTH	0.047	(0.027)	0.011	0.112	0.893	0.187	1

TABLE II

Impact of Bank Priority Sector Lending on Bank NBFC Lending and NBFC Credit Extension by Bank Group and NBFC Type

The random NBFC effects maximum likelihood regressions in this table examine the impact of priority sector lending of the banks on banks' NBFC lending and NBFC credit extension by bank groups and NBFC types. 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%.

Panel A

Dependent Variable:	ΔBL/A				ΔTC/A			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
CONSTANT	0.019	0.029*	0.019	0.019	0.101***	0.085**	0.104***	0.103***
	(0.016)	(0.016)	(0.016)	(0.016)	(0.034)	(0.034)	(0.034)	(0.034)
ΔPSLALL/PSLALL	0.122***				-0.172***			
	(0.037)				(0.064)			
ΔPSLSBI/PSLALL		0.157		-0.007		-0.094		0.175
		(0.126)		(0.136)		(0.219)		(0.236)
ΔPSLOTH/PSLALL			0.150***	0.151***			-0.226***	-0.249***
			(0.044)	(0.047)			(0.076)	(0.082)
SIZE	-0.007***	-0.007***	-0.007***	-0.007***	-0.065***	-0.065***	-0.065***	-0.065***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.008)	(0.008)	(0.008)	(0.008)
CAP	0.038***	0.038***	0.038**	0.038***	0.049	0.049	0.049	0.048
	(0.014)	(0.014)	(0.014)	(0.014)	(0.036)	(0.036)	(0.036)	(0.036)
LIQ	0.01	0.009	0.009	0.009	0.064	0.067**	0.063**	0.063**
	(0.014)	(0.014)	(0.014)	(0.014)	(0.031)**	(0.031)	(0.031)	(0.031)
NPA	0.008	-0.009	-0.008	-0.008	-0.037	-0.036	-0.037	-0.038
	(0.016)	(0.016)	(0.016)	(0.016)	(0.033)	(0.033)	(0.033)	(0.033)
YCS	-0.012	-0.017	-0.015	-0.015	0.350	0.361	0.354	0.360
	(0.150)	(0.150)	(0.150)	(0.150)	(0.271)	(0.271)	(0.271)	(0.271)
GDP	0.001	-0.056	0.011	0.012	0.867***	0.953***	0.845***	0.838***
	(0.153)	(0.153)	(0.153)	(0.153)	(0.271)	(0.271)	(0.271)	(0.271)
INF	-0.015	-0.033	-0.010	-0.010	0.013	0.038	0.005	0.001
	(0.059)	(0.059)	(0.059)	(0.059)	(0.107)	(0.107)	(0.107)	(0.107)
Loglikelihood	2346.80	2342.16	2347.29	2347.30	896.02	892.56	896.92	897.19
Likelihood Ratio	31.43***	22.14***	32.41***	32.41***	119.43***	112.50***	121.22***	121.77***

	Panel B							
Dependent Variable:	ΔBL/A				ΔTC/A			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
IC	0.013	0.018	0.012	0.011	0.057*	0.041	0.060*	0.059*
	(0.016)	(0.016)	(0.016)	(0.017)	(0.034)	(0.034)	(0.034)	(0.034)
FC	0.031*	0.047***	0.030*	0.031*	0.146***	0.128***	0.148***	0.148***
	(0.017)	(0.016)	(0.017)	(0.017)	(0.037)	(0.036)	(0.036)	(0.037)
IC*ΔPSLALL/PSLALL	-0.009				-0.114			
	(0.052)				(0.090)			
FC*ΔPSLALL/PSLALL	0.258***				-0.238*			
	(0.053)				(0.092)			
IC*ΔPSLSBI/PSLALL		0.091		0.137		0.017		0.227
		(0.176)		(0.190)		(0.307)		(0.332)
FC*ΔPSLSBI/PSLALL		0.222		-0.144		-0.217		0.116
		(0.180)		(0.193)		(0.314)		(0.340)
IC*ΔPSLOTH/PSLALL			-0.022	-0.040			-0.161	-0.191*
			(0.061)	(0.066)			(0.106)	(0.114)
FC*ΔPSLOTH/PSLALL			0.327***	0.345***			-0.300***	-0.315***
			(0.062)	(0.066)			(0.108)	(0.116)
SIZE	-0.009***	-0.009***	-0.009***	-0.009***	-0.065***	-0.065***	-0.065***	-0.065***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.008)	(0.008)	(0.008)	(0.008)
CAP	0.031**	0.031**	0.032**	0.032**	0.048	0.047	0.047	0.047
	(0.013)	(0.013)	(0.013)	(0.013)	(0.035)	(0.345)	(0.345)	(0.345)
LIQ	0.019	0.155	0.019	0.019	0.067**	0.071**	0.066**	0.066**
	(0.013)	(0.013)	(0.013)	(0.013)	(0.031)	(0.031)	(0.030)	(0.030)
NPA	-0.009	-0.009	-0.008	-0.008	-0.037	-0.036	-0.037	-0.037
	(0.015)	(0.015)	(0.015)	(0.015)	(0.032)	(0.032)	(0.032)	(0.032)
YCS	0.009	0.001	0.008	0.009	0.356	0.368	0.359	0.366
	(0.149)	(0.150)	(0.149)	(0.149)	(0.271)	(0.271)	(0.271)	(0.271)
GDP	0.015	-0.041	0.028	0.030	0.881***	0.971***	0.858***	0.852***
	(0.153)	(0.153)	(0.153)	(0.153)	(0.271)	(0.269)	(0.271)	(0.271)
INF	-0.001	-0.025	-0.005	-0.005	0.015	0.039	0.006	0.002
	(0.059)	(0.059)	(0.059)	(0.058)	(0.107)	(0.106)	(0.106)	(0.106)
Loglikelihood	2366.20	2355.25	2368.33	2368.87	906.43	902.59	907.31	907.61
Likelihood Ratio	89.39***	66.94***	93.61***	94.60***	141.63***	132.71***	143.61***	144.24***

TABLE III

TABLE III
Impact of Bank Branching on Bank NBFC Lending and NBFC Credit Extension by Bank Group and NBFC Type

The random NBFC effects maximum likelihood regressions in this table examine the impact of bank branching in semi-urban areas relative to metropolitan areas of the banks on banks' NBFC lending and NBFC credit extension by bank groups and NBFC types. Control variables are suppressed and the same as in Table II. 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%.

Dependent Variable:	ΔBL/A				ΔTC/A			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
CONSTANT	0.143**	0.402**	0.104**	0.398**	0.468***	0.010	0.360***	-0.016
	(0.070)	(0.177)	(0.051)	(0.177)	(0.126)	(0.311)	(0.093)	(0.311)
SU/M-ALL	-0.106				-0.377***			
	(0.066)				(0.120)			
SU/M-SBI		-0.242**		-0.210**		0.048		0.268
		(0.115)		(0.121)		(0.201)		(0.211)
SU/M-OTH			-0.079	-0.049			-0.315***	-0.354***
			(0.054)	(0.057)			(0.098)	(0.103)
Loglikelihood	2342.69	2343.60	2342.46	2343.97	897.43	892.50	897.58	898.38
Likelihood Ratio	23.21***	25.02***	22.74***	25.76***	122.24***	112.37***	122.54***	124.15***

Panel A

	Panel B							
Dependent Variable:	ΔBL/A				ΔTC/A			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
IC	-.0290	0.343	-0.025	0.361	0.208	-0.457	0.171	-0.446
	(0.091)	(0.228)	(0.066)	(0.227)	(0.165)	(0.404)	(0.120)	(0.404)
FC	0.319***	0.423*	0.242***	0.368	0.747***	0.448	0.566***	0.359
	(0.0951)	(0.229)	(0.070)	(0.229)	(0.173)	(0.403)	(0.127)	(0.404)
IC*SU/M-ALL	0.040				-0.178			
	(0.841)				(0.153)			
FC*SU/M-ALL	-0.215***				-0.596***			
	(0.088)				(0.161)			
IC*SU/M-SBI		-0.212		-0.269*		0.309		0.430
		(0.145)		(0.151)		(0.256)		(0.268)
FC*SU/M-SBI		-0.243*		-0.092		-0.196		0.151
		(0.146)		(0.157)		(0.256)		(0.275)
IC*SU/M-OTH			0.042	0.080			-0.162	-0.223
			(0.069)	(0.072)			(0.125)	(0.131)
FC*SU/M-OTH			-0.204***	-0.196**			-0.486***	-0.502***
			(0.073)	(0.079)			(0.133)	(0.143)
Loglikelihood	2358.85	2356.34	2358.82	2360.42	909.35	903.66	909.28	910.58
Likelihood Ratio	72.02***	68.84***	71.89***	74.98***	154.35***	135.59***	154.18***	157.44***

TABLE IV

Impact of Term Deposits at Banks on Bank NBFC Lending and NBFC Credit Extension by Bank Group and NBFC Type

The random NBFC effects maximum likelihood regressions in this table examine the impact of term deposits at banks on banks' NBFC lending and NBFC credit extension by bank groups and NBFC types. Control variables are suppressed and the same as in Table II. 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%.

	Panel A							
Dependent Variable:	ΔBL/A				ΔTC/A			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
CONSTANT	0.035	0.032**	0.025	0.034*	0.105***	0.083**	0.113***	0.107***
	(0.018)	(0.016)	(0.017)	(0.018)	(0.036)	(0.033)	(0.036)	(0.037)
ΔTDALL/TDALL	-0.047				-0.380			
	(0.147)				(0.255)			
ΔTDSBI/TDSBI		-0.102**		-0.11*		0.163*		0.070*
		(0.051)		(0.06)		(0.086)		(0.103)
ΔTDOTH/TDOTH			0.088	-0.03			-0.400**	-0.326
			(0.096)	(0.114)			(0.167)	(0.198)
Loglikelihood	2341.44	2343.50	2341.81	2343.53	893.58	894.26	895.37	895.60
Likelihood Ratio	20.69***	24.82***	21.45***	24.88***	114.54***	115.89***	118.12***	118.58***

		Panel B							
Dependent Variable:		ΔBL/A				ΔTC/A			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
IC	0.023	0.017	0.018	0.026	0.066*	0.042	0.072**	0.067*
	(0.018)	(0.016)	(0.018)	(0.018)	(0.037)	(0.034)	(0.036)	(0.037)
FC	0.050***	0.052***	0.036**	0.047**	0.145***	0.123***	0.153***	0.147***
	(0.019)	(0.016)	(0.018)	(0.019)	(0.039)	(0.036)	(0.038)	0.039
IC ΔTDALL/TDALL	-0.077				-0.436			
	(0.164)				(0.285)			
FC ΔTDALL/TDALL	-0.008				-0.333			
	(0.164)				(0.287)			
IC ΔTDSBI/TDSBI		-0.019		-0.012		0.132		0.039
		(0.061)		(0.069)		(0.107)		(0.121)
FC ΔTDSBI/TDSBI		-0.190***		-0.211***		0.198*		0.103
		0.062		(0.070)		(0.108)		(0.122)
IC ΔTDOTH/TDOTH			-0.037	-0.184			-0.426*	-0.343
			(0.117)	(0.133)			(0.204)	(0.232)
FC ΔTDOTH/TDOTH			0.226*	0.142			-0.380*	-0.315
			(0.118)	(0.134)			(0.206)	(0.234)
Loglikelihood	2354.52	2359.32	2356.70	2362.16	903.56	904.27	905.28	905.64
Likelihood Ratio	65.27***	74.99***	69.71***	80.86***	135.16***	137.25***	139.58***	140.61***

TABLE V

Impact of the Crisis and Bank Priority Sector Lending on Bank NBFC Lending and NBFC Credit Extension by Bank Group and NBFC Type

The random NBFC effects maximum likelihood regressions in this table examine the impact of the crisis and priority sector lending of the banks on banks' NBFC lending and NBFC credit extension by bank groups and NBFC types. Control variables are suppressed and the same as in Table II. 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%.

	Panel A							
Dependent Variable:	ΔBL/A				ΔTC/A			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
CONSTANT	0.055***	0.068***	0.068***	0.054***	0.167***	0.140***	0.174***	0.175***
	(0.020)	(0.020)	0.020	(0.020)	(0.038)	(0.038)	(0.038)	(0.038)
CRISIS	-0.021***	-0.024***	-0.020***	-0.020***	-0.044***	-0.039***	-0.046***	-0.0475***
	(0.007)	(0.007)	(0.007)	(0.007)	(0.012)	(0.012)	(0.012)	(0.012)
ΔPSLALL/PSLALL	0.107***				-0.204***			
	(0.037)				(0.065)			
ΔPSLSBI/PSLALL		0.167		0.030		-0.080		0.257
		(0.126)		(0.136)		(0.219)		(0.237)
ΔPSLOTH/PSLALL			0.129***	0.125***			-0.275***	-0.310***
			(0.044)	(0.048)			(0.077)	(0.083)
Loglikelihood	2351.38	2348.17	2351.53	2351.55	902.47	897.62	903.94	904.53
Likelihood Ratio	40.58***	34.16***	40.88***	40.93***	132.32***	122.63**	135.26***	136.44***

Dependent Variable:	ΔBL/A				ΔTC/A			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
IC	0.040**	0.048**	0.038*	0.038*	0.107***	0.081**	0.114***	0.115***
	(0.020)	(0.020)	(0.020)	(0.020)	(0.039)	(0.038)	(0.039)	(0.039)
FC	0.076***	0.095***	0.074***	0.075***	0.232***	0.201***	0.238***	0.239***
	(0.021)	(0.020)	(0.021)	(0.021)	(0.041)	(0.040)	(0.041)	(0.041)
IC*CRISIS	-0.009	-0.011	-0.008	-0.009	-0.021	-0.016	-0.023	-0.024*
	(0.008)	(0.008)	(0.008)	(0.008)	(0.014)	(0.014)	(0.015)	(0.015)
FC*CRISIS	-0.032***	-0.035***	-0.031***	-0.031***	-0.067***	-0.062***	-0.070***	-0.071***
	(0.008)	(0.008)	(0.008)	(0.008)	(0.015)	(0.015)	(0.015)	(0.015)
IC*ΔPSLALL/PSLALL	-0.019				-0.139			
	(0.052)				(0.090)			
FC*ΔPSLALL/PSLALL	0.237***				-0.279***			
	(0.053)				(0.092)			
IC*ΔPSLSBI/PSLALL		0.094		0.158		0.017		0.279
		(0.175)		(0.189)		(0.307)		(0.332)
FC*ΔPSLSBI/PSLALL		0.234		-0.098		-0.201		0.214
		(0.180)		(0.192)		(0.313)		(0.336)
IC*ΔPSLOTH/PSLALL			-0.036	-0.057			-0.197*	-0.236**
			(0.061)	(0.066)			(0.106)	(0.115)
FC*ΔPSLOTH/PSLALL			0.298***	0.311***			-0.361***	-0.389***
			(0.062)	(0.068)			(0.108)	(0.117)
Loglikelihood	2374.18	2365.02	2375.83	2376.31	917.18	911.75	918.64	919.19
Likelihood Ratio	104.48***	85.40***	107.77***	108.70***	172.90***	159.59**	176.48***	177.82***

Panel B

TABLE VI

Impact of the Crisis and Bank Branching on Bank NBFC Lending and NBFC Credit Extension by Bank Group and NBFC Type

The random NBFC effects maximum likelihood regressions in this table examine the impact of the crisis and bank branching of the banks on banks' NBFC lending and NBFC credit extension by bank groups and NBFC types. Control variables are suppressed and the same as in Table II. 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%.

	Panel A							
Dependent Variable:	ΔBL/A				ΔTC/A			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
CONSTANT	0.003	0.438**	0.009	0.475***	0.349**	0.075	0.287***	0.025
	(0.083)	(0.176)	(0.059)	(0.177)	(0.148)	(0.311)	(0.105)	(0.313)
CRISIS	-0.028***	-0.023***	-0.030***	-0.037***	-0.024	-0.0389***	-0.024	-0.020
	(0.009)	(0.007)	(0.009)	(0.009)	(0.016)	(0.012)	(0.016)	(0.017)
SU/M-ALL	0.073				-0.226			
	0.087				(0.154)			
SU/M-SBI		-0.240**		-0.349***		0.042		0.196
		(0.114)		(0.125)		(0.201)		(0.220)
SU/M-OTH			0.079	0.168**			-0.192	-0.242*
			(0.072)	(0.077)			(0.128)	(0.140)
Loglikelihood	2347.64	2349.49	2347.90	2351.78	898.64	897.58	898.69	899.08
Likelihood Ratio	33.11***	36.81***	33.61***	41.38***	124.66***	122.54***	124.76***	125.55***

	Panel B							
Dependent Variable:	ΔBL/A				ΔTC/A			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
IC	-0.105	0.360	-0.076	0.401*	0.249	-0.444	0.214	-0.491
	(0.110)	(0.227)	(0.078)	(0.228)	(0.196)	(0.404)	(0.140)	(0.405)
FC	0.122	0.464**	0.109	0.482**	0.489**	0.555	0.391***	0.502
	(0.111)	(0.228)	(0.080)	(0.230)	(0.200)	(0.403)	(0.143)	(0.406)
IC*CRISIS	-0.020*	-0.011	-0.021**	-0.029***	-0.003	-0.016	-0.001	0.009
	(0.011)	(0.008)	(0.011)	(0.011)	(0.019)	(0.014)	(0.019)	(0.020)
FC*CRISIS	-0.036***	-0.035***	-0.038***	-0.044***	-0.044**	-0.062***	-0.044**	-0.045**
	(0.010)	(0.008)	(0.010)	(0.011)	(0.018)	(0.015)	(0.018)	(0.019)
IC*SU/M-ALL	0.154				-0.188			
	(0.110)				(0.196)			
FC*SU/M-ALL	-0.014				-0.304			
	(0.110)				(0.198)			
IC*SU/M-SBI		-0.204		-0.354**		0.324		0.515*
		(0.144)		(0.157)		(0.256)		(0.279)
FC*SU/M-SBI		-0.238*		-0.282*		-0.217		-0.086
		(0.145)		(0.164)		(0.256)		(0.289)
IC*SU/M-OTH			0.148	0.235**			-0.179	-0.312*
			(0.091)	(0.099)			(0.162)	(0.177)
FC*SU/M-OTH			0.000	0.074			-0.243	-0.199
			(0.092)	(0.105)			(0.165)	(0.186)
Loglikelihood	2365.11	2365.93	2365.43	2368.77	912.92	913.05	912.95	914.89
Likelihood Ratio	84.88***	86.72***	85.55***	92.36***	163.75***	162.97**	163.80***	168.54***

TABLE VII

Impact of the Crisis and Term Deposits at Banks on Bank NBFC Lending and NBFC Credit Extension by Bank Group and NBFC Type

The random NBFC effects maximum likelihood regressions in this table examine the impact of the crisis and term deposits at banks on banks' NBFC lending and NBFC credit extension by bank groups and NBFC types. Control variables are suppressed and the same as in Table II. 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%.

	Panel A							
Dependent Variable:	ΔBL/A				ΔTC/A			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
CONSTANT	0.076***	0.070***	0.066***	0.074***	0.168***	0.142***	0.181***	0.174***
	(0.022)	(0.020)	(0.021)	(0.022)	(0.041)	(0.037)	(0.040)	(0.041)
CRISIS	-0.024***	-0.022***	-0.023***	-0.023***	-0.041***	-0.041***	-0.043***	-0.044***
	(0.007)	(0.008)	(0.007)	(0.007)	(0.012)	(0.012)	(0.012)	(0.012)
ΔTDALL/TDALL	-0.094				-0.460*			
	(0.148)				(0.257)			
ΔTDSBI/TDSBI		-0.090*		-0.108*		0.189**		0.079
		(0.050)		(0.059)		(0.087)		(0.103)
ΔTDOTH/TDOTH			0.050	-0.065			-0.477***	-0.394**
			(0.096)	(0.115)			(0.168)	(0.200)
Loglikelihood	2347.50	2348.93	2347.43	2349.09	899.16	899.94	901.61	901.89
Likelihood Ratio	32.81***	24.82***	32.68***	36.01***	125.70***	127.27***	10.59***	131.17***

Panel B								
Dependent Variable:		ΔBL/A				ΔTC/A		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
IC	0.052**	0.052**	0.048**	0.053**	0.106**	0.084**	0.118***	0.112***
	(0.022)	(0.020)	(0.022)	(0.022)	(0.042)	(0.038)	(0.041)	(0.042)
FC	0.106***	0.102***	0.088***	0.100***	0.233***	0.201***	0.247***	0.241***
	(0.023)	(0.020)	(0.022)	(0.023)	(0.043)	(0.040)	0.043	(0.044)
IC*CRISIS	-0.010	-0.007	-0.012	-0010	-0.017***	-0.019	-0.019	-0.019
	(0.008)	(0.008)	(0.008)	(0.008)	(0.015)	(0.014)	(0.015)	(0.015)
FC*CRISIS	-0.037***	-0.037***	-0.033***	-0.035***	-0.065	-0.064***	-0.068***	-0.068***
	(0.008)	(0.008)	(0.008)	(0.008)	(0.0149)	(0.015)	(0.015)	(0.015)
IC ΔTDALL/TDALL	-0.048				-0.389			
	(0.165)				(0.289)			
FC ΔTDALL/TDALL	-0.131				-0.546*			
	(0.166)				(0.291)			
IC ΔTDSBI/TDSBI		0.015		0.004		0.187*		0.070
		(0.061)		(0.069)		(0.107)		(0.121)
FC ΔTDSBI/TDSBI		-0.201***		-0.223***		0.194*		0.087
		(0.062)		(0.070)		(0.108)		(0.122)
IC ΔTDOTH/TDOTH			-0.020	-0.159			-0.386*	-0.302
			(0.119)	(0.134)			(0.208)	(0.235)
FC ΔTDOTH/TDOTH			0.132	0.043			-0.579***	-0.499**
			(0.121)	(0.136)			(0.211)	(0.237)
Loglikelihood	2364.36	2370.10	2364.76	2371.23	913.36	913.96	915.95	916.25
Likelihood Ratio	83.82***	95.86***	84.78***	98.28***	163.67***	165.51***	170.46***	171.30***

Appendix I

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.

Panel A: NBFC Variables		
Variable	Label	Definition
Change in Bank Loans / Assets	ΔBL/A	Change in bank loans from previous quarter to the current quarter scaled by previous quarter assets
Change in Total Credit / Assets	ΔTC/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 an financing company and zero otherwise
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
Panel B: Economic Variables		
Variable	Label	Definition
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

Panel C: Bank Group Variables		
Variable	Label	Definition
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	ΔPSLALL/PSLALL	Change in PSLALL from previous quarter to the current quarter scaled by previous quarter PSLALL
Change in PSLSBI / PSLALL	ΔPSLSBI/PSLALL	Change in PSLSBI from previous quarter to the current quarter scaled by previous quarter PSLALL
Change in PSLOTH / PSLALL	ΔPSLOTH/PSLALL	Change in PSLOTH from previous quarter to the current quarter scaled by previous quarter PSLALL
Semi-Urban to Metropolitan Bank Branch Ratio of All Banks	SU/M-ALL	Ratio of sum of number of semi-urban bank branches to sum of number of metropolitan bank branches of all banks
Semi-Urban to Metropolitan Bank Branch Ratio of SBI Group	SU/M-SBI	Ratio of sum of number of semi-urban bank branches to sum of number of metropolitan bank branches of banks of SBI Group
Semi-Urban to Metropolitan Bank Branch Ratio of Other Bank Groups	SU/M-OTH	Ratio of sum of number of semi-urban bank branches to sum of number of metropolitan bank branches of banks of all bank groups except SBI Group
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	ΔTDALL/TDALL	Change in TDALL from previous quarter to the current quarter scaled by previous quarter TDALL
Change in TDSBI / TDSBI	ΔTDSBI/TDSBI	Change in TDSBI from previous quarter to the current quarter scaled by previous quarter TDSBI
Change in TDOTH / TDOTH	ΔTDOTH/TDOTH	Change in TDOTH from previous quarter to the current quarter scaled by previous quarter TDOTH