A closer look at banks' behaviour in emerging credit markets? Evidence from the Indian banking industry*

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Abstract:

Using bank-level data from India, for six years (1995-96 to 2000-01), we examine banks' behaviour in the context of emerging credit markets. Our results indicate that the credit market behaviour of banks in emerging markets is largely determined by past trends. We also find evidence to support the hypothesis that prudential regulations have a significant impact on the banks' behaviour with respect to credit disbursal. Finally, we find evidence that suggest that credit expansion by banks in emerging markets may be significantly constrained by the inability of the banks to reduce the liquidity risk associated with non-securitised loans.

A closer look at banks' behaviour in emerging credit markets?

Evidence from the Indian banking industry

1. Background

Much of the literature on banking in emerging market focuses on the either the broad relationship between ownership and financial performance (e.g., Sarkar, Sarkar and Bhaumik, 1998) or the agency aspect of ownership, i.e., the impact of separation between management and ownership on the performance of banks (e.g., Gorton and Schmid, 1999; Hirshey, 1999). The focus on the relationship between ownership and financial performance of banks operating in emerging markets stems from concern about both the possibility of inefficient allocation of scarce financial resources in the presence of dominant public sector banks that often manifest McKinnon-Shaw type financial repression, and also from the concern about the possible fiscal impact of banking sector fragility in an environment where directed credit, political patronage, and severe moral hazard on the part of (public sector) bank officials can lead to significant accumulation of non-performing assets (NPAs).

While the focus on ownership is not completely unjustified in the context of banking sectors in emerging markets, it has drawn attention of the researchers away from the fact that, unlike a manufacturing or services sector firm, a bank helps mobilize domestic savings for subsequent investment in various on-going and new projects, and thereby also serves as the conduit for transmission of monetary policy, and as a facilitator of economic growth. Indeed, it is now stylised in the literature that the intermediary role of the banks plays an important role in fostering growth, even though in some countries a well-functioning credit market has also had the unwelcome effect of fostering growth by way of debt accumulation rather than by way of improving total factor productivity

(Gertler and Gilchrist, 1993; Ketkar, 1993; Ma and Smith, 1996; Bulir, 1998; Acemoglu, 2001; Bell and Rousseau, 2001; Da Rin and Hellman, 2002; Jeong, Kymn and Kymn, 2003). In other words, in the context of banking, not only are allocative efficiency and financial performance of the banks important, but so also is the amount of credit disbursed by the bank.

The fallacy of the analyses that emphasise the ownership of banks, with the prior that private ownership is better than public ownership, is evident. While private ownership of banks may improve the allocative efficiency in the credit market, at least so long as the market is not subjected to financial repression, there is evidence to suggest that private ownership in the banking sector may well be detrimental to disbursal of credit, if the risks associated with the disbursal of credit is significantly high. For example, the International Monetary Fund (2000) noted that subsequent to privatisation of banks in Bulgaria, following the banking-currency crisis of 1996-97, the banking sector was reluctant to lend in the high-risk environment, resulting in a ratio of private sector credit to GDP of about 12 percent, the optimal value of the ratio for a country with Bulgaria's per capita GDP being about 30 percent. Latin American evidence suggests that foreign banks are especially risk averse and that significant market penetration by foreign banks in a developing economy context might adversely affect credit disbursal to small and medium enterprises (Clarke, Cull, D'Amato and Molinari, 1999; Clarke, Cull, and Peria 2001; Clarke, Cull, Peria and Sanchez, 2002).

However, Banerjee and Duflo (2001) have argued that credit rationing on account of risk averseness is not specific to domestic private and foreign banks. They show, using Indian data, that public sector or government owned banks can also exhibit such risk averseness, albeit more on account of the political economy of "blame sharing" in the event of bad performance of banks than on account of profit motive. In other words, behaviour of banks in credit markets of emerging economies may not be some monotonic function of ownership; credit disbursal by banks in such (inherently high risk) markets may be depend on a host of other factors. Hence, it is worthwhile exploring the credit market behaviour of banks in emerging market contexts.

The main problem in extending the Banerjee and Duflo methodology to a larger proportion of the banking sector in India, or indeed any other developing country, is that it requires data on *all* credit related transactions of the banks, which is difficult if not impossible to obtain in a developing country context. Indeed the data used by Banerjee and Duflo itself is very limited, restricted to the activities of one Indian public sector bank that accounted for about 5 percent of the banking assets at the time of the analysis. In this paper, therefore, we propose to address this important issue using an alternative methodology for which data is available for all banks operating in India (hereafter called "Indian" banks), and for multiple years.

By and large, Indian banks have the choice of investing their resources in safe government bonds, or in risky credit instruments. *Ceteris paribus*, a bank has to choose the nature of the distribution of its resources between the riskless and risky assets, and this choice is manifested in the so-called credit-to-deposit ratio (CDR). We then estimate a model – described later in the paper – that expresses CDR as a function of the credit risk associated with the banks' potential borrower pool, and the risk averseness of the banks. In keeping with the literature (Banerjee and Duflo, 2001), we also use a lagged dependent variable in the specification, to allow for persistence in the CDR. The estimation uses the random effects technique which allows us to capture the impact of ownership – which does not change over time for individual banks – on the CDR. The robustness of our results is verified by measuring CDR in two different ways, and by using two different (yet overlapping) samples for the analysis, one of which includes only the domestic banks, while the other includes all banks, domestic and foreign.

The choice of India as the context of analysis is justified by the fact that the Indian banking sector is marked by the presence of public sector banks, incumbent and *de novo* private domestic sector banks, and foreign banks., and, at the same time, has undergone significant reforms and liberalisation since the early 1990s (Sarkar, Sarkar and Bhaumik, 1998, Shirai and Rajsekaran, 2001; Bhaumik and Mukherjee, 2002), thereby granting all these banks effective operational autonomy. Recent literature has found evidence of convergence among these different types of Indian banks in terms of financial performance (Bhaumik and Dimova, 2004), indicating that these banks have taken advantage of the reforms to compete with each other, and learn from each other to be able to invade each other's market niches. However, the existing literature does not indicate whether there has also been a convergence in the credit market behaviour of the different types of banks, with respect to credit disbursal. At the same time, despite a large market capitalisation by developing country standards, banks remain the main source of capital for most small and medium companies, and start up enterprises. Hence, Indian banking provides an ideal setting for the proposed analysis.

Our analysis suggests that, as indicated by the analysis of Banerjee and Duflo (2001), there is a strong persistence in the CDR, whether on account of the aforementioned relationship based nature of the business, or on account of the inability of a large proportion of the banks to effectively assess credit risk associated with individual loan applications. The regression results, as also the descriptive statistics, highlight the fact that the *de novo* private banks, which have together been the key driver of competition in the Indian banking industry since the liberalisation of the banking-financial sector in the early 1990s, lend less in the form of non-securitised debt than the other domestic banks. However, if securitised debt is taken into consideration, there are no observable differences in the credit market activity of public sector banks, old private banks and the *de novo* private banks. Given earlier evidence that the *de novo* banks are as efficient and as profit oriented as the foreign banks (Sarkar, Sarkar and Bhaumik, 1998; Bhaumik and Dimova, 2004), this implies that as the banking sector in India become more and more profit oriented, either on account of ownership changes or on account of greater competition, the extent of participation of the banks in the credit market would critically depend on the development of the (secondary) market for corporate securities. Finally, our results highlight a strong, and robust, negative relationship between NPA and CDR, indicating that it is imperative to encourage the Indian banks to clean their balance sheets and rid them of these assets, such that they do not prove to be an obstacle to the banks' activities in the credit market. However, the results also indicate that Indian banks are not pursuing a too-big-to-fail strategy.

The rest of the paper is organised as follows: In Section 2, we develop the theoretical basis for the regression/empirical model used later in the paper, and report the model specifications. The data are discussed in Section 3. In Section 4, we report the results of the analysis, and Section 5 concludes.

2. Modelling bank behaviour in credit markets

A bank is a multi-product firm; its portfolio consists of non-securitised loans, as well as securities issued by non-government entities and federal, state and local governments. In addition, a bank generates revenues from fee-based contracts and speculation/participation in the market for off-balance sheet items. In developing countries, the choices facing the banks are usually fairly limited, partly on account of government regulations, and partly on account of missing or underdeveloped markets for assets and instruments such as equity and financial derivatives. In India, for example, equities accounted for less that 1 percent of the banks' assets in both 1996-97 and 2000-01. At the same time, while states, regions and local bodies in developing countries have different degrees of credit worthiness, the political economy of most of these countries ensure that all government securities carry the implicit or explicit guarantee of the federal government. In other words, it is possible to think of banks in developing countries having two broad choices; they can either invest their resources, net of the cash reserve ratio and other regulatory caveats, into safe government securities, or disburse them as credit to the non-government sector, when all such credit is inherently more risky than investment in government securities.

Let the following be true: the return on the riskfree government bonds is r_f, the expected return on the risky credit-related assets is $E(r_p)$, and a bank invests y proportion of its resources in the latter and $(1 - y)$ proportion in the former. In that case, it is easy to show that the expected returns arising out of this asset allocation is given by

$$E(r) = r_f + y[E(r_P) - r_f] \quad [1]$$

Now let the utility function of the bank be given by

$$U = E(r) - A\sigma^2 \quad [2]$$

when σ is the risk associated with the asset allocation strategy, and A is a measure of the extent of risk averseness of the bank. The optimization program of the bank is then given by $\underset{y}{Max} U$ and it yields y^* as a function of $E(r_p)$, r_f, σ and A.

If an empirical analysis is limited to any one country, with limited capital account convertibility, then, for any given year, r_f (i.e., some average of the returns on government securities of different maturities) is by and large the same across all banks. Hence, cross-sectional variation in y^* (i.e., CDR) across banks would be largely explained by variations in the returns on the non-government assets, the risks associated with these assets, and the degrees of risk aversion of the individual banks. The CDR of a bank would be expected to increase with the expected return on the non-government assets, decrease with the risk associated with such assets, and also decrease with its degree of risk averseness. Asset pricing theories suggest that risk and return are usually positively related.[1] Alternatively, since a bank loan is similar to a coupon bond held until maturity, the risk associated with a bank loan is a credit risk, not an interest rate risk, and it can be argued that expected returns from a bank loan is simply a linear function of the credit risk. In other words, the inclusion of both a measure of risk and expected returns in the specification is likely to give rise to collinearity problems. Therefore, we can further reduce the specification to a functional relationship between the CDR on the one hand, and the credit risk associated with loan disbursals and the risk averseness of the banks on the other.

Banking is a relationship based activity, and hence the borrower pool for any bank is usually restricted by the geographical coverage of its branch network, and its regions of operation. We proxy the geographical coverage of a bank by the number of branches it operates. Further, we take into consideration the policy legacies of Indian banks that led to these banks having large rural networks (see Bhaumik and Mukherjee, 2002), and treat the Indian landscape as being comprised of broadly two large regions, namely, rural and urban. We take this into account using the proportion of a bank's branch

[1] In India, for example, a bank is allowed to charge up to 400 basis points over and above its prime lending rate to account for increasing levels of risk.

network that is in the rural areas. Since a large branch network enables a bank to minimize the risk associated with its portfolio by way of diversification a large number of borrowers, we expect CDR to increase with a bank's branch network (TOTBRANCH). On the other hand, given the reasonable assumption that inadequate collateral, missing secondary markets for collateral, higher transactions costs associated with contract enforcement in areas that are not well connected to urban centres, and the political economy of loan forgiveness make credit disbursal in the rural market more risky than the urban credit market, we expect CDR to be inversely related to the proportion of branches in the rural areas (RUR2TOT).

The risk averseness of a bank can arise from two different sources; a bank may be innately risk averse or it may be reluctant to take risk on account of factors like the impact of its past behaviour on its financial position. In the Indian context, the relative degree of innate risk averseness of a bank is not difficult to measure. To begin with, it can be argued that banks with different ownership patterns (OWNERSHIP) would have different levels of innate risk averseness. However, it is difficult to predict *a priori* the exact relationship between ownership and risk averseness. For example, in principle, it is possible to argue that a foreign bank may be more risk averse than a domestic bank because it has less knowledge of the local credit market and fewer informal options of enforcing contracts. On the other hand, it can also be argued that the Indian assets account for a very small proportion of the overall asset base of a foreign bank, such that it would be more willing to take risk to capture market share.

The second measure of innate risk averseness, however, is likely to have a predictable relationship with a bank's choice of CDR. All banks in India are required by the Reserve Bank of India (RBI) to maintain 25 percent of their deposits in the form of safe liquid (i.e., mostly government securities). However, since the mid 1990s, most banks have voluntarily invested much more than 25 percent of their assets in government securities, a behaviour that has been dubbed "lazy banking" by Indian policymakers. The rationale for lazy banking is the risk associated with credit disbursal in a developing country with attendant economic cycles and underdeveloped legal institutions to enforce contracts, and perhaps also the knowledge on the part of the responsible banks that they may not have the necessary expertise to screen potential borrowers. In other words, lazy banking is a manifestation of risk averseness. We, therefore, use the ratio of a bank's exposure to government securities, as percentage of its deposits, and in excess of the required 25 percent, to the median exposure of all the banks in the sample, as a measure of risk averseness (GSECEXP).[2] It is easy to see that a high value for this variable would manifest a high degree of risk averseness. In order to avoid endogeneity issues, the measure of risk averseness for a bank in period *t* would be the estimated ratio for the bank in period *t-1*.

Legacy may have an impact on the risk averseness of a bank in two different ways. Given that the Indian banks are expected to abide by the prudential norms laid down by the RBI, if past lending of a bank results in accumulation of non-performing assets, it imposes a cost on the bank in the form of both higher capital requirements and higher cost of capital. This cost of capital, in turn, might induce a bank to restrict its lending activities so as to reduce further capital requirement. Conversely, a bank with a large stock of bad or doubtful assets might want to expand its operations rapidly to make up for past losses and/or to become too big to fail (see, e.g., Randall, 1993). Hence, we use

[2] Suppose that a bank has invested 32 percent of its deposits into government securities. In that case, its excess holding of such securities over and above that required by the RBI is 7 percentage points. If the median of this excess for all banks is 10 percent, then our measure of risk averseness for this bank is 0.7.

the NPA legacy of a bank as a measure of regulation and/or legacy induced risk averseness (NPA).

The RBI also requires banks to earmark a stipulated minimum percentage of the disbursed credit for the so-called priority sector which is comprised largely of agriculture and small firms. Banerjee, Cole and Duflo (2003) have noted that the risk associated with priority sector lending is high, on average. Data suggests that in any given year some banks are unable to meet the RBI regulation apropos priority sector lending, i.e., they do not disburse as much of the credit to the priority sector as they should. If a bank does not meet the minimum required exposure limits to the priority sector in a year *t-1*, there are two possible outcomes in year *t*. The bank can either decide that the RBI's enforcement of the risk-augmenting priority sector lending norms are not well enforced, or it may be coerced by the RBI to compensate for its laxity in providing priority sector credit in the past year. In the former case, the risk averseness of the bank in period *t* is likely to decline while, in the latter case, its risk averseness in that period is likely to increase. As with the investment in government securities, we proxy this measure of risk averseness using a ratio of a bank's *distance* from the RBI mandated lower limit for priority sector exposure to the median distance of all the banks in the sample (PRIORITY). Risk averseness would increase or decrease with this measure depending upon whether or not the effectiveness with which the RBI enforces its priority sector norms. Once again, to address possible endogeneity issues, we use one-period lagged values of these measures of risk averseness in the specification.

In other words, our specification is as follows:

$$CDR_{i,t} = f(TOTBRANCH_{i,t}, RUR2TOT_{i,t}, OWNERSHIP_{i,t},$$
$$GSECEXP_{i,t-1}, NPA_{i,t-1}, PRIORITY_{i,t-1}) \qquad [3a]$$

However, as mentioned earlier in the paper, we will also have to take into account the possibility of persistence, i.e., the possibility that CDR in time period *t* is significantly dependent on the CDR in time period *t-1*. This could either be because of the relationship based nature of banking as a business activity, or be a manifestation of the inability of an average bank to effectively assess the credit risk associated with individual loan applications (Banerjee and Duflo, 2001). The augmented specification, therefore, is given by

$$CDR_{i,t} = f(CDR_{i,t-1}, TOTBRANCH_{i,t}, RUR2TOT_{i,t}, OWNERSHIP_{i,t},$$
$$GSECEXP_{i,t-1}, NPA_{i,t-1}, PRIORITY_{i,t-1}) \qquad [3b]$$

3. Data

The model has been estimated using data obtained from the *Indian Banks' Association*. The empirical analysis involves the use of data from six financial years: 1995-96 through 2000-01. However, the use of lagged values in the specification results in the use of data from only years 1996-97 through 2000-01 for the regression analysis. The data suggests that although there were 36 foreign banks registered in India during the period, the 12 largest foreign banks accounted for nearly 90 percent of the deposit and asset base of this group. Further, all the others had a maximum of 2 branches in India, suggesting that their main line of business was not providing credit to Indian borrowers. Rather, most of these banks provided trade credit and services related to cross-border transactions. Hence, we included in our sample only those banks that had more than 2 branches operating in India. Eventually, we were left with 27 public sector banks (PUBLIC), 24 incumbent domestic private sector banks (OLDPRIVATE) which had been in operation prior to the initiation of liberalisation of the banking sector, 8 *de novo* domestic private sector banks which started operation after the initiation of liberalization (NEWPRIVATE), and 12 foreign banks (FOREIGN). Together, they account for about 98 percent of the deposits and assets of the Indian banking industry.

INSERT Table 1 about here.

The summary statistics for the data are reported in Table 1. As mentioned earlier, we report two measures of CDR, namely, the ratio of non-securitised advances to deposits (CDR1), and the ratio of the sum of non-securitised and securitised loans to deposits (CDR2). The descriptive statistics indicate the following: (a) the CDR of the foreign banks are noticeably higher than those of the other types of banks, and (b) over time, there has been an increase in the share of securitised credit in overall loan commitment of all types of banks, but the increase is most noticeable for the *de novo* private banks and the foreign banks. The former can be explained by the fact that foreign banks often make loans within India using deposits raised abroad, thereby making the credit disbursed in India a high proportion of the deposits collected in India. It is, however, the latter observation that has significant policy implications. Given the reasonable assumption that these banks have access to human capital that enable them to manage interest rate risk better than the public sector banks and the incumbent private sector banks, this suggests that banks with strong profit motive and appropriate skills in India view the risk associated with interest rate fluctuations, which itself has been reduced by the stabilisation of the (wholesale price based) inflation rate between 4 and 7 percent, to be more benign than the risk associated with loan assets for which there is no secondary market. This has significant implications for the Indian credit market, given the relatively modest pace of structural changes in the secondary market for corporate debt (Bhaumik, Bose and Coondoo, 2003).

The data on the exposure of the banks to government securities suggests that all types of banks, and especially the public sector banks, buy government securities over and above the SLR requirement. Further, even after correcting for the inflation (an average of about 6-7 percent per year), there was a significant growth in the “excess” exposure of all types of Indian banks to these sovereign securities. This has widely been discussed in the Indian policy circles as “lazy banking” and indicates that the banks were finding it increasingly difficult to disburse the deposits collected as loans. However, the high rate of growth of the excess exposure to safe securities masks the fact that this exposure is a small fraction of the overall deposit and asset base of the banks. In other words, while the average Indian bank is clearly risk averse, the degree of risk averseness is perhaps not enough to significantly its decisions regarding the choice of CDR.

The data also indicates that the average Indian bank was not meeting its regulatory obligation with respect to priority sector lending during the time period being examined. Table 1 reports the “distance” of the actual credit exposure to priority sector from the floor set by the regulatory norms. Hence, a positive number indicates that the exposure of a bank is below the regulation-mandated exposure. The descriptive statistics suggest that the aforementioned distance rose over time for all types of banks, even after we account for inflation. While the rise is not nearly as dramatic in percentage terms as the rise in the banks’ exposure to government securities, nevertheless it suggests that the banks do not face the threat of punitive action from the regulators if they do not meet the priority sector target. This is consistent with the earlier result that priority sector exposure is not a significant determinant of bank performance in India (Sarkar, Sarkar and

Bhaumik, 1998). It is easy to see that, therefore, PRIORITY, as defined earlier in the paper, is likely to be positively correlated with CDR.

Finally, we report the four different measures of NPA that are reported by the RBI, namely, ratio of gross NPA to total assets (NPA-1), ratio of net NPA to total assets (NPA-2), ratio of gross NPA to gross assets (NPA-3) and ratio of net NPA to net assets (NPA-4). Not surprisingly, the public sector banks had more NPA on their balance sheets in 1996-97. But they were able to significantly reduce their stock of NPA over time, even as there was an increase in the NPA exposure of all other types of banks. The increase in the NPA exposure of *de novo* private and foreign banks was, perhaps, inevitable, given that they expanded their businesses in the aftermath of the liberalisation of the Indian banking sector during the first half of the 1990s. However, it is remarkable that, unlike the public sector banks, the old private banks were unable to reduce their exposure to NPA. This is consistent with the earlier result that while the performance of the public sector banks has improved significantly over time, the old private banks have emerged as the new laggards (Bhaumik and Dimova, 2004).

4. Results

The regression results, based on specification [3b] are reported in Tables 2 and 3. In both tables, columns 1-4 report the coefficient estimates obtained using the sample of domestic banks, while columns 5-8 report the coefficient estimates obtained using the sample of all (eligible) banks, domestic or foreign. We estimated the specification for the two different samples because, unlike other banks, foreign banks are capable of lending deposits raised overseas in the Indian market, and hence it is not obvious as to whether they are directly comparable with Indian banks. In Table 2, CDR has been defined as the ratio of nonsecuritised advances to deposits, while, in Table 3, CDR has been defined as the ratio of the sum of securitised and non-securitised loans to deposits. The R-square statistics, which are well above 0.7, as well as the Wald chi-square statistics reported for all the specifications indicate that the model is a good fit for the data, irrespective of the way in which we define CDR and NPA, and irrespective of the choice of sample. Further, given that the lagged dependent variable and NPA are strongly significant (at the 1 percent level) across almost all specifications, and given that ownership too seems to matter to an extent, rules out the possibility of the high R-square results on account of multicollinearity.

INSERT Table 2 about here.

INSERT Table 3 about here.

The results indicate that, to begin with, there is a strong persistence in the CDR of an average Indian bank, which is consistent with the findings of Banerjee and Duflo (2001). As mentioned earlier, this persistence could simply be a consequence of the nature of banking which is a relationship based activity. But, it could also be on account of the fact that an average Indian bank is not good at evaluating the credit worthiness of potential debtors, thereby rewarding the moribund yet stable businesses at the expense of more dynamic enterprises that have a more volatile (expected) flow of income.

Further, NPAs have a significant impact on the ability of a bank to take risk by opting for more loans and less investment in government securities. Specifically, rather than take more risk in order to become too-big-to-fail, they become more risk averse and restrict lending. This is consistent with the ownership pattern of banks in India where about 85 percent of the banking assets are either with public sector banks that cannot fail by definition, or are with incumbent private sector banks that are closely held, thereby making the executive management, many who whom are involved in active day-to-day management of the banks, risk averse. On the other hand, as pointed out by Banerjee and Duflo (2001), making advances that turn bad may attract significant government-led punitive action on account of political compulsions, and this acts as a strong antidote to the moral hazard of the officials of public sector banks. The policy implication is clearly that reduction in NPA will increase the intensity of participation of Indian banks in the credit market.

However, while these results are interesting, and in conformity with the existing literature, perhaps the most important result is the confirmation of the growing trend among profit oriented banks in India to opt for securitised credit over more traditional forms of loan disbursement. It can be seen that when CDR is defined only in terms of non-securitised advances (Table 2), *de novo* private banks are significantly different from the other domestic banks in that, *ceteris paribus*, they disburse a smaller share of their deposits as loans. But, once CDR is defined to include corporate debt securities, this difference disappears. This result is both consistent with the descriptive statistics presented in Table 1, which indicates that the *de novo* banks are disbursing increasingly greater percentage of credit in the form of securitised loans, and robust across choice of samples and specifications. As mentioned earlier, this implies that profit seeking dynamic banks view interest rate risk associated with securitisation of their loan based assets as a relatively smaller problem than the liquidity risk associated with corporate assets that are used as collateral for non-securitised loan, and this implication is completely consistent with the evidence (e.g., Enron/Dabhol Power Project) on the high cost associated with bankruptcy and liquidation in India. The move to securitisation of debt has been further facilitated by the fact that all corporate securities that are purchased by the bank are routinely vetted by credit rating agencies, thereby reducing the need for the banks to develop in-house capabilities to assess credit risk.

The implication for this result is twofold. To begin with, it suggests. that as competition, greater accountability on account of sale and enlistment of shares on the stock exchanges, and hard budget constraints drive incumbent domestic banks towards greater profit orientation, and as there is a change in the ownership profile of the Indian banks on account of mergers and acquisitions and (gradual) privatisation, disbursal of credit by banks to businesses would significantly depend on the state of the market for corporate bonds. However, recent studies indicate that despite some measures by the government, the Securities and Exchange Board of India (SEBI) and the RBI, the Indian bond market is marked by high liquidity risk, prices that are inconsistent with the term structure of the interest rate and corporate credit ratings, and generally a slow rate of spread of information (e.g., Bhaumik, Bose and Coondoo, 2003). In other words, while the move towards securitisation suggests that Indian credit market intermediaries are maturing as financial institutions, the lack of maturity of the market for corporate securities is likely to pose an important barrier to rapid expansion of credit as the economy continues to grow rapidly into the future. Additionally, the result brings to the fore the possibility that, in the absence of low cost ways to liquidate the assets of defaulting borrowers, or an active market for hedging instruments like credit derivatives, an increasing proportion of the banks' resources is likely to flow to established firms that can underwrite the cost of issuing securities, thereby restricting the ability of new yet dynamic firms to access bank credit. This, of course, has a significant implication for innovation and productivity growth of the Indian real sector.

5. Concluding Remarks

This paper highlights three aspects of banks' behaviour in the context of emerging credit markets that are not captured by the literature that focuses on the relationship between ownership and performance of banks. Our results indicate that the credit market behaviour of banks in emerging markets is largely determined by past trends, presumably limiting significantly the ability of new yet dynamic firms and sectors to grow rapidly. We also find evidence to support the hypothesis that prudential regulations have a significant impact on the banks' behaviour with respect to credit disbursal. Finally, we find evidence that suggest that credit expansion by banks in emerging markets may be significantly constrained by the inability of the banks to reduce the liquidity risk associated with non-securitised loans, thereby drawing our attention to the importance of having a low cost way for banks to liquidate the assets/collateral of the defaulting borrowers, and the need for hedging instruments like credit derivatives. This third result also reinforces the possibility that dynamic yet small and newly established firms, which are unable to bear the cost of issuing debt securities, may find it increasingly difficult to access bank credit as the banks themselves become more profit conscious on account of greater competition and/or ownership changes. Clearly, while competition and privatisation are important aspects of policy making in the context of banking sectors in emerging markets, in the absence of supporting institutions in the form of bankruptcy-liquidity code, well functioning markets for corporate debt instruments, markets for hedging credit risk with appropriate financial instruments etc, and in the absence of adequate personnel who can assess credit risk of potential borrowers, these policies may also hinder deepening and widening of the credit market, thereby affecting adversely the central objective of economic growth.

References

Acemoglu, Daron, 2001. Credit market imperfections and persistent unemployment, European Economic Review 45(4-6), 665-79

Banerjee, Abhijit. V. and Esther Duflo, 2001. The nature of credit constraints: Evidence from an Indian bank, Mimeo, Massachusetts Institute of Technology, Cambridge, Massachusetts

Banerjee, Abhijit, Shawn Cole and Esther Duflo, 2003. Bank financing in India, Mimeo, Massachusetts Institute of Technology, Cambridge, Massachusetts

Bell, Clive and Peter L. Rousseau, 2001. Post-independence India: a case of finance-led industrialization? Journal of Development Economics 65(1), 153-75

Bhaumik, Sumon K and Paramita Mukherjee 2002. The Indian banking sector: A commentary, In: Parthasarathi Banerjee and Frank-Jurgen Richter (eds.) Economic Institutions in India: Sustainability under Liberalization and Globalization, Palgrave Macmillan, London, pp. 71-98

Bhaumik, Sumon K, Suchismita Bose and Dipankor Coondoo, 2003. The emerging Indian bond market: Evolution, problems and prospects. Journal of Global Financial Markets, Spring, 33-43

Bhaumik, Sumon K and Ralitza D Dimova, 2004. How important is ownership in a market with level playing field? The Indian banking sector revisited, Journal of Comparative Economics 32(1), 165-180

Bulir, Ales, 1998. Business cycle in Czechoslovakia under central planning: Were credit shocks causing it? Journal of Comparative Economics 26(2), 226-45

Clarke, George, Robert Cull, Laura D'Amato and Andrea Molinari, 1999. The effect of foreign entry on Argentina's domestic banking sector, Policy Research Working Paper 2158, The World Bank, Washington, D.C.

Clarke, George, Robert Cull and Maria S. M. Peria, 2001. Does foreign bank penetration reduce access to credit in developing countries? Evidence from asking borrowers, Mimeo, Development Research Group, The World Bank, Washington, D.C.

Clarke, George, Robert Cull and Maria S. M. Peria and Susana M. Sanchez, 2002. Bank lending to small businesses in Latin America: Does bank origin matter? Mimeo, The World Bank, Washington, D.C.

Gertler Mark and Simon Gilchrist, 1993. The cyclical behavior of short-term business lending: Implications for financial propagation mechanisms, European Economic Review 37(2-3), 623-31

Gorton, Gary and Frank Schmid, 1999. Corporate governance, ownership dispersion and efficiency: Empirical evidence from Austrian cooperative banking, Journal of Corporate Finance 5, 119-40

Hirshey, Mark, 1999. Managerial equity ownership and bank performance, Economic Letters 64, 209-13

Indian Banks' Association, 1995. Indian Banking Yearbook

Indian Banks' Association, 1995-2001. Performance Highlights of Banks

International Monetary Fund, 2000. Bulgaria: Selection issues and statistical appendix. IMF Staff Country Report, 00/54

Jeong, Woocheon, Kem O. Kymn and Christine J. Kymn, 2003. The long-run interdependence of bank-health, investment-oriented bank loans, and economic performance: A time-series analysis, The Quarterly Review of Economics and Finance 43(1), 11-30

Ketkar, Kusum, 1993. Public sector banking, efficiency and economic growth in India, World Development 21(10), 1685-97

Ma, Chien-Hui and Bruce D Smith, 1996. Credit market imperfections and economic development: Theory and evidence, Journal of Development Economics 48(2), 351-87

Randall, Richard E. (Ed.), 1993. Safeguarding the Banking System in an Environment of Financial Cycles, Federal Reserve Bank of Boston.

Reserve Bank of India, Trends and Progress of Banking in India, various issues

Sarkar, Jayati, Subrata Sarkar and Sumon K. Bhaumik, 1998. Does ownership always matter? Evidence from the Indian banking industry? Journal of Comparative Economics 26, 262-281

Shirai, Sayuri and Prithipal Rajsekaran, 2001. Is India's banking sector reform successful from the perspective of the governance of the banking system? Mimeo, Economic and Social Commission for Asia and the Pacific

Table 1: Descriptive statistics

	1996-97				2000-01			
	Public	**Old private**	**New private**	**Foreign**	**Public**	**Old private**	**New private**	**Foreign**
CDR1	0.4651	0.5220	0.5666	0.8002	0.4703	0.4936	0.4925	0.8160
	(0.0786)	(0.1142)	(0.1037)	(0.2038)	(0.0610)	(0.1109)	(0.0651)	(0.2882)
CDR2	0.5153	0.5738	0.6528	0.8324	0.5464	0.5882	0.6378	0.9896
	(0.0770)	(0.1195)	(0.0818)	(0.2034)	(0.0586)	(0.0995)	(0.0323)	(0.3076)
TOTBRANCH	1652.9260	173.4000	15.1250	11.9166	1715.4810	201.0909	110.2857	12.0000
	(1672.7790)	(115.6525)	(3.8706)	(15.5648)	(1710.9940)	(126.6491)	(107.3619)	(11.5836)
RUR2TOT	64.8714	58.4732	13.7325	0	63.2977	58.1645	27.9714	0.4066
	(7.7677)	(17.9232)	(16.9906)	(0)	(5.8632)	(14.1939)	(10.4245)	(1.4087)
GSECEXP	33.5674	-0.9614	-1.9007	3.2698	6.6031	0.0977	1.0946	1.3519
	(73.8195)	(2.0959)	(0.6252)	(4.9186)	(11.7800)	(0.4316)	(1.1235)	(0.7438)
PRIORITY	5.3035	0.4727	0.4354	1.1963	3.4146	0.3901	0.8309	0.7350
	(7.4860)	(0.5158)	(0.3240)	(0.8450)	(4.5707)	(0.3383)	(0.2762)	(0.6135)
NPA-1	8.1185	4.6141	0	1.0483	5.9959	5.5373	1.8257	2.8025
	(3.3138)	(2.3697)	(0)	(1.1036)	(2.2977)	(2.1009)	(1.1073)	(1.7728)
NPA-2	3.7303	2.4520	0	0.2741	3.1374	3.5430	1.2185	1.0291
	(1.8937)	(1.3687)	(0)	(0.5511)	(1.1962)	(1.7406)	(1.0097)	(0.9042)
NPA-3	18.1185	9.7204	0.3362	1.9541	14.1966	12.7139	4.3628	6.7483
	(7.4132)	(6.1907)	(0.9470)	(1.8984)	(5.8578)	(5.8743)	(2.2314)	(4.4453)
NPA-4	9.4407	5.7687	0	0.5075	8.0000	8.4334	2.9114	2.6058
	(5.1171)	(3.8988)	(0)	(1.0251)	(3.2347)	(4.9919)	(1.9696)	(2.5793)

Note: 1. The numbers within parentheses are standard deviations.
2. In the regression analysis, reported in Tables 2-3, GSECEXP and PRIORITY for a bank are defined as the ratio of the "distance" of the bank's exposure to government securities and the priority sector, respectively, from the respective regulatory floors to the corresponding "distance" of the median bank in the same year. However, while such benchmarking is common in financial literature, the resultant ratios are difficult to interpret. Hence, in Table 1, we report the aforementioned "distance" itself.

Table 2: Determinants of credit allocation (Equation 3b)
LHS variable = Advances/Deposits

	Only domestic banks				All banks: domestic and foreign			
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Constant	0.145155 ***	0.148892 ***	0.203593 ***	0.173215 ***	0.175046 ***	0.157341 ***	0.190647 ***	0.166902 ***
	(0.022915)	(0.022478)	(0.025803)	(0.023574)	(0.027659)	(0.027319)	(0.030222)	(0.028321)
LAG(CDR1)	0.753247 ***	0.693760 ***	0.673280 ***	0.673290 ***	0.715961 ***	0.706798 ***	0.679093	0.697982 ***
	(0.035104)	(0.034638)	(0.034943)	(0.034943)	(0.032365)	(0.032130)	(0.033112)	(0.032261)
TOTBRANCH	2.59E-06	- 2.74E-06	- 7.68E-07	- 7.68E-07	1.59E-06	- 3.68E-07	2.71E-06	2.72E-06
	(8.02E-06)	(8.53E-06)	(8.39E-06)	(8.39E-08)	(0.000012)	(0.000012)	(0.000012)	(0.000022)
RUR2TOT	- 0.000200	- 0.000020	- 0.000016	- 0.000016	- 0.000187	- 0.000028	- 0.000064	- 0.000049
	(0.000175)	(0.00184)	(0.0.00181)	(0.000181)	(0.000281)	(0.000284)	(0.000280)	(0.000282)
OLDPRIVATE	- 0.006563	- 0.000410	- 0.006129	- 0.002221	- 0.008723	- 0.002129	- 0.007504	- 0.003040
	(0.008888)	(0.009221)	(0.008916)	(0.009028)	(0.013562)	(0.013677)	(0.013446)	(0.013573)
NEWPRIVATE	- 0.030289 **	- 0.022574	- 0.042035 ***	- 0.031213 **	- 0.037467 *	- 0.032543	- 0.046152 **	- 0.035313
	(0.015124)	(0.015495)	(0.015237)	(0.015081)	(0.022761)	(0.022902)	(0.022921)	(0.022772)
FOREIGN					0.040256	0.057033 **	0.053460 **	0.053632 **
					(0.026095)	(0.000114)	(0.025712)	(0.026126)
GSECEXP	- 0.000069	- 0.000157	- 0.000051	- 0.000102	- 0.000064	- 0.000134	- 0.000020	- 0.000077
	(0.000153)	(0.000162)	(0.000159)	(0.000160)	(0.000244)	(0.000249)	(0.000251)	(0.000250)
PRIORITY	- 0.001042	0.000742	- 0.000128	- 0.000091	- 0.000803	- 0.000099	- 0.001358	- 0.001206
	(0.002391)	(0.002543)	(0.002451)	(0.002590)	(0.003566)	(0.003657)	(0.003631)	(0.003675)
NPA-1	- 0.002825 **				- 0.004570 ***			
	(0.001157)				(0.001339)			
NPA-2		- 0.001549				- 0.005690 **		
		(0.002061)				(0.002660)		
NPA-3			- 0.002147 ***				- 0.002347 ***	
			(0.000552)				(0.000725)	
NPA-4				- 0.002311 ***				- 0.002804 **
				(0.000793)				(0.001106)
R-square	0.7690	0.7312	0.7424	0.7389	0.8071	0.7958	0.7992	0.7974
Wald chi-sq	575.56	485.61	542.91	515.29	1021.59	966.01	1027.01	987.85
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Nobs	279	281	280	281	337	339	338	341

Table 3: Determinants of credit allocation (Equation 3b)
LHS variable = (Advances + Corporate debt securities)/Deposits

	Only domestic banks				All banks: domestic and foreign			
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Constant	0.139472 ***	0.140173	0.194688 ***	0.158880 ***	0.170915 ***	0.155990 ***	0.735381 ***	0.160851 ***
	(0.024353)	(0.024114)	(0.029803)	(0.026365)	(0.032171)	(0.032482)	(0.0394683)	(0.034955)
LAG(CDR2)	0.803893 ***	0.765360 ***	0.700226 ***	0.740833 ***	0.773683 ***	0.761686 ***	0.735381 ***	0.747446 ***
	(0.033885)	(0.034706)	(0.039210)	(0.036555)	(0.036500)	(0.037398)	(0.039469)	(0.039093)
TOTBRANCH	2.65E-06	- 9.12E-07	- 6.99E-07	- 4.36E-08	4.31E-06	3.41E-06	5.23E-06	5.35E-06
	(7.61E-06)	(8.29E-06)	(8.15E-06)	(8.26E-06)	(0.000012)	(0.000013)	(0.000013)	(0.000014)
RUR2TOT	- 0.000128	0.000049	0.000034	0.000047	- 0.000131	0.000054	2.02E-06	0.000029
	(0.000172)	(0.000186)	(0.000182)	(0.000185)	(0.000308)	(0.000318)	(0.000315)	(0.000323)
OLDPRIVATE	- 0.005565	- 0.000279	- 0.003323	- 000704	- 0.008041	- 0.000820	- 0.004155	- 0.000625
	(0.007659)	(0.008130)	(0.008143)	(0.008089)	(0.013710)	(0.014465)	(0.014345)	(0.014968)
NEWPRIVATE	- 0.016553	- 0.014032	- 0.021639	- 0.015064	- 0.024397	- 0.022342	- 0.027249	- 0.018834
	(0.013772)	(0.014501)	(0.014470)	(0.014239)	(0.023847)	(0.024850)	(0.024961)	(0.025519)
FOREIGN					0.056795 **	0.074947 **	0.078246 ***	0.081886 ***
					(0.028470)	(0.029848)	(0.019201)	(0.030269)
GSECEXP	- 0.000072	- 0.000153	- 0.000089	- 0.000127	- 0.000020	- 0.000083	- 2.36E-06	- 0.000046
	(0.000158)	(0.000171)	(0.000170)	(0.000171)	(0.000276)	(0.000284)	(0.000288)	(0.000289)
PRIORITY	- 0.001454	- 0.000260	- 0.000603	- 0.000643	- 0.002185	- 0.001858	- 0.002611	- 0.002531
	(0.002270)	(0.002474)	(0.002438)	(0.002471)	(0.003803)	(0.004007)	(0.004026)	(0.004146)
NPA-1	- 0.002914 ***				- 0.005061 ***			
	(0.001108)				(0.001481)			
NPA-2		- 0.003071				- 0.007456 **		
		(0.001988)				(0.0029712)		
NPA-3			- 0.001759 ***				- 0.001993 **	
			(0.000569)				(0.000830)	
NPA-4				- 0.001826 **				- 0.002528 **
				(0.000799)				(0.001282)
R-square	0.7587	0.7133	0.7186	0.7162	0.7967	0.7841	0.7827	0.7850
Wald chi-sq	847.18	676.57	685.12	686.38	1190.71	1030.06	1066.91	980.94
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Nobs	279	281	280	281	332	334	333	336