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Bank Financing in India

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6.1 Introduction

The Indian banking sector has been remarkably successful in some respects. Its immense size and enormous penetration in rural areas are exemplary among developing countries, as is its solid reputation for stability among depositors. The penetration in rural areas has been associated with a reduction of poverty and a diversification out of agriculture.[2] However, in recent years, it has been widely viewed as being both expensive and inept. In particular, it has been argued that most banks are overstaffed, that a large fraction of their assets are nonperforming, and that they under lend, in the sense of not putting enough effort into their primary task of financing industry.[3] A wide range of remedies have been suggested ranging from strengthening the legal system to punish defaulters, to abolishing the targeted lending programs (so-called priority sector rules), to privatization of the entire banking system.

Many of these recommendations have been controversial, partly because there is relatively little hard evidence directly supporting the implied judgments or even confirming the main diagnoses behind them. The challenge here is twofold:

- First, the problems facing banks are mutually reinforcing, which makes it difficult to identify the primary cause (if any). For example, underlending and large nonperforming assets (NPAs) inflate banks' operating costs, which they cover by setting high interest rates. This leads to further underlending by these banks. In another example, banks with a large existing stock of NPAs naturally attract more public scrutiny. This makes their loan officers adopt a more conservative stance, also resulting in underlending.
- Second, and more importantly, most of these judgments are made without an appropriate counterfactual. Credit–deposit ratios could be low because (i) banks are not trying to lend; (ii) marginal loans are too risky; or (iii) capital adequacy is too low. In addition, banks may face insufficient demand. It is also not clear why we should necessarily believe that privatization would alleviate the problem of underlending or NPAs.[4] A comparison of public and private banks today is not appropriate because so far the private banks in India, for the most part, have limited themselves to dealing with corporate clients.

This chapter pulls together a recent body of evidence on the question of underlending and argues that there is clear evidence that socially and even privately profitable lending opportunities remain unexploited in the current environment. It then discusses why this might be the case. The chapter concludes with a discussion of the relevant policy responses, including the possibility of foreign investment.[5]

6.2 Is there underlending?

Identifying underlending

A firm is considered to be getting too little credit if the marginal product of capital in the firm is higher than the rate of interest that firm is paying on its marginal unit of borrowing. We propose identifying credit constraints by the following observation—if a firm that is *not* credit constrained is offered some additional credit at a rate below what it is paying on the market, the best way to make use of the new loan is to pay down its current market borrowing, rather than to invest more. Since a nonconstrained firm would invest only until the marginal product of capital equaled the rate of interest, the additional investment would yield a lower return. By contrast, a constrained firm would increase investment.

In Banerjee and Duflo (2003), we test these predictions by taking advantage of a recent change in the so-called priority sector rules in India—all banks in India are required to lend at least 40 percent of their net credit to the "priority sector," (which includes small-scale industry (SSI)), at an interest rate of no more than 4 percent above their prime lending rate. In January 1998, the limit on total investment in plants and machinery for a firm to be eligible for inclusion in the SSI category was raised from Rs 6.5 million to Rs 30 million. Our empirical strategy focuses on the firms that became newly eligible for credit in this period and uses firms that were always eligible for priority sector credit as control. The results from our analysis are reported briefly in the subsections that follow.

Specification

Through much of this section, we will estimate an equation of the form

$$y_{it} - y_{it-1} = \alpha_y \mathrm{BIG}_i + \beta_y \mathrm{POST}_t + \gamma_y \mathrm{BIG}_i * \mathrm{POST}_t + \varepsilon_{yit} \qquad (6.1)$$

with y taking the role of the various outcomes of interest (credit, revenue, profits, etc.), the dummy BIG conveying a large firm (explained below), and the dummy POST representing the post-January 1998 period. We are in effect comparing how the outcomes change for the big firms after 1998 with how they change for the small firms. y is expressed here as a growth rate, thus, it is, in effect, a triple difference in equation (6.1). As such, we can allow small firms and big firms to have different rates of growth and for the rate of growth to vary from year to year. However, we also assume that there would have been no differential changes in the rate of growth of the various outcomes for small and large firms in 1998, in the absence of the change in priority sector regulations. Using the (log) credit limit and (log) next year's sales (or profit), respectively, in place of y in equation (6.1), we obtain the first stage and the reduced form of a regression of sales on credit, using the interaction BIG * POST as an instrument for credit.

Data

We use data from loan portfolios of a better performing Indian public sector bank (PSB). The loan folders include information on profit, sales, credit sanctions, and interest rates, as well as figures that loan officers are required to calculate (e.g. projections of the bank's future turnover and credit needs) to determine the amount to be lent. Our sample comprises 253 firms (including 93 newly eligible firms for priority lending) from 1997–99.

Results

Estimation of equation (6.1) using bank credit as the outcome shows that the change in priority lending regulations greatly affected those who got priority sector credit. In Table 6.1, panel A, column (2) of, for the sample of firms where there was a change in credit limit, the coefficient of the interaction BIG * POST is 0.24 in the credit equation, with a standard error of 0.09. However, this increase in credit was not accompanied by a change in the rate of interest (column (3)). Nor did it lead to reduction in the rate of utilization of the limits by the big firm (column (4))—the ratio of total turnover (the sum of all debts incurred during the year) to credit limit is not associated with the interaction BIG * POST. Rather, the higher credit limit resulted in an increase in bank credit utilization by the firms.

We also find that the additional credit in turn led to increased sales. The coefficient of the interaction BIG * POST in the sales equation, in the sample where the credit limit was increased, is 0.21, with a standard error of 0.09 (column (5)). By contrast, in the sample where there was no increase in credit limit, the interaction BIG * POST in the sales equation is close to zero (0.05) and insignificant (column (8)), which suggests that the result in column (4) is not driven by a failure of the identification assumption. In summary, sales increased almost as fast as loans in response to the reform. This is an indication that there was no substitution of bank credit for nonbank credit (e.g. trade credit) as a result of the reform, and that firms are credit constrained.[6]

Table 6.1 Are firms credit constrained?

Sample	Complete sample	Sample with change in limit						Sample with no change in limit	
	Any change in limit	$\text{Log(loan)}_t - \text{Log(loan)}_{t-1}$	$\text{Log(interest rate)}_t - \text{Log(interest rate)}_{t-1}$	$\text{Log(turnover/limit)}_{t+1} - \text{Log(turnover/limit)}_t$	$\text{Log(sales)}_{t+1} - \text{Log(sales)}_t$: All firms	$\text{Log(sales)}_{t+1} - \text{Log(sales)}_t$: No substitution	$\text{Log(profit)}_{t+1} - \text{Log(profit)}_t$	$\text{Log(sales)}_{t+1} - \text{Log(sales)}_t$	$\text{Log(profit)}_{t+1} - \text{Log(profit)}_t$
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Panel A: Ordinary least squares[a]									
Dependent variables									
POST	−0.003	−0.115	−0.008	−0.115	0.021	0.005	0.172	0.030	−0.316
	(0.049)	(0.069)	(0.014)	(0.366)	(0.093)	(0.096)	(0.201)	(0.047)	(0.153)
BIG	−0.043	−0.218	−0.002	−0.105	−0.199	−0.191	−0.645	0.077	0.058
	(0.053)	(0.079)	(0.014)	(0.147)	(0.094)	(0.101)	(0.219)	(0.063)	(0.309)
BIG * POST	−0.008	0.244	0.012	0.267	0.209	0.184	0.752	0.052	0.034
	(0.078)	(0.099)	(0.019)	(0.355)	(0.095)	(0.099)	(0.387)	(0.109)	(0.531)
Number of observations	489	155	141	39	116	105	107	253	209
Panel B: Two-stage least squares (2SLS)[b]									
Dependent variable									
$\text{Log(loan}_t) - \text{Log(loan)}_{t-1}$					0.896		2.713		
					(0.463)		(1.290)		
Number of observations					116		107		

[a] Standard errors in parentheses (corrected for heteroskedasticity and clustering at the sector level).
[b] 2SLS regressions using BIG * POST as the instrumental variable. The regression controls for BIG and POST dummies.
Sources: Data from a public bank in India and authors' estimates.

In column (7), we present the effect of the reform on profit, which is even bigger than that on sales—0.75, with a standard error of 0.38. We note that the effect of the reform on profit is due to the gap between the marginal product of capital and the *bank* interest rate; in other words, it combines the subsidy effect and the credit constraint effect. Even if firms were not credit constrained, their profit would increase after the reform if more subsidized credit is made available to them, because they substitute cheaper capital for more expensive capital. Here again, we see no effect of the interaction BIG * POST in the sample without a change in limit (column (9)), which lends support to our identification assumption.[7]

The instrumental variable (IV) estimate of the effect of loans on sales and profit implied by the reduced form and first stage estimates in columns (2), (5), and (7) are presented in Table 6.1, panel B, columns (5) and (7).[8] We note that the coefficient in column (5) is a lower bound of the effect of bank credit on sales, because the reform should have led to some substitution of bank credit for market credit. The IV coefficient is 0.90, with a standard error of 0.46. It suggests that the effect of working capital on sales is very close to 1, a result which implies that there cannot be equilibrium without credit constraints. Referring to column (7), the IV estimate of the impact of bank credit on profit is 2.7. We can use this estimate to get a sense of the average increase in profit caused by every rupee in lending. The average size of the loan in the sample is Rs 96,000. Therefore, an increase of Rs 1000 in the size of the loan corresponds to a 1.04 percent increase. Using the coefficient of loans on profits, an increase of Rs 1000 in lending, therefore, causes a 2.7 percent increase in profit. At the mean profit, which is Rs 37,000 in the sample, this would correspond to an increase in profit of Rs 999. Thus, the increase in profits resulting from an increase in loans is nearly identical *net of interest*. This gap is far too large to be explained by the subsidy in the interest rate to SSI firms.

Conclusion

These results provide definite evidence of very substantial underlending; some firms clearly can absorb much more capital at high rates of return. Moreover, the firms in our sample are by Indian standards quite substantial—these are not the very small firms at the margins of the economy, where, even if the marginal product is high, the scope for expansion may be quite limited. In Section 6.3, we try to investigate the connection between these results about the pattern of lending and the way lending is carried out in India.

6.3 Lending practice in India

Official lending policies

While nominally independent, PSBs are subject to intense regulation by the Reserve Bank of India (RBI), including current rules governing the amount of bank lending. In this section, we describe these rules, examine to what extent they are followed, and determine which non-policy variables influence lending decisions.

Specification

Historically, two methods have been used to calculate the maximum permissible bank financing of a firm—the "working capital" approach and the "turnover" approach. The working capital approach is based on the presumption that firms' current assets are illiquid, and that firms should cover 25 percent of the financing gap with equity capital, and 75 percent with bank credit.[9] Thus maximum permissible bank financing is defined as:

$$0.75 * \text{Current Assets} - \text{Other Current Liabilities} \tag{6.2}$$

The turnover approach defines firms' financing needs to be 25 percent of projected turnover, and allows firms to finance 80 percent of this need from banks—that is, up to 20 percent of turnover. Maximum permissible bank financing is thus defined as:

$$\text{Min}\,(0.20 * \text{Projected Turnover}, 0.25 * \text{Projected Turnover} - \text{Available Margin}) \tag{6.3}$$

where the Available Margin is Current Assets less Current Liabilities, as calculated from a firm's balance sheet. The margin is deducted because it is presumed that the firms' other financing will continue to be available. Note that if the turnover-based rule were followed exactly, firms' available margin would be precisely 5 percent of turnover, and the two amounts in equation (6.3) would be equal.[10]

For the bank examined here, the loan officer was supposed to calculate both equation (6.3) and the older rule represented by equation (6.2) for all loans below Rs 40 million (including all loans in our sample). The largest permissible limit on the loan was the maximum of these two numbers. No rules prohibit banks (including the PSB examined here) from lending less than the limit, and it is not clear how (or how often) the limit is actually enforced. Thus, we turn to the actual practice of lending.[11]

Data

We use the same data source (described above) to look at what bankers actually do. Since we have data on current assets and other current liabilities, it is trivial to calculate the limit according to the traditional working capital gap-based method of lending (LWC). We can also calculate the limit for turnover gap-based method (LTB). The maximum of LTB and LWC is, according to the rules, the real limit on how much the banker can lend to the firm.

Results

We show the comparison of the actual limit granted and max(LTB, LWC) in Table 6.2. In 78 percent of the cases, the limit granted is smaller than the amount permitted. Most strikingly, in 64 percent of the cases for which we know the amount granted in the previous period, the amount granted is exactly equal to the amount granted in the previous period. Given that inflation was 5 percent or higher during the sample period, the real amount of the loans, therefore, decreases between the two adjacent years in a majority of the cases. To make matters worse, in 73 percent of these cases, the firm's sales increased, implying, as we presume, a greater demand for working capital. Further, this is the case despite the fact that according to the bank's own rules, the limit could have gone up in 64 percent of the cases (note that getting a higher limit is simply an option and does not cost the firm anything unless it uses the additional financing).

We report the results of the regression of the actual limit granted on information that might be expected to play a role in its determination in Table 6.3. Not surprisingly, the amount of past lending is a very powerful predictor of today's lending. In column (1), we regress the (log) current loan amount on the (log) past loan amount and the (log) loan limit according to the rules. Even though the bank's rule never refers to past loan as a determinant of permissible sanction, the coefficient of past loan is 0.76, with a *t*-statistic of 18. The maximum permissible limit is also significant, with a coefficient of 0.26. This suggests that a change in the previous granted limit increases the current granted limit by three times as much as a change in the maximum permissible limit as calculated by the bank.

Table 6.2 Bank financing—granted, maximum, and previous limits of a PSB[a]

	Actual limit granted versus limit on turnover basis		Actual limited granted versus bank's official policy		Actual limit granted versus previous granted limit[b]		Bank's official policy versus previous official policy[b]	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Smaller	255	62.2	542	78.2	22	4.4	153	34.8
Same	81	19.8	9	1.3	322	64.1	6	1.4
Larger	74	18.0	142	20.5	158	31.5	281	63.9
Same as 1997	23	25.0	2	1.3	37	5.3	0	0.0
Same as 1998	25	20.7	2	0.9	109	68.1	2	1.3
Same as 1999	27	16.2	4	1.9	156	70.3	4	2.2

[a] Column (1) is the number of loans approved or allowed in relation to the maximum permissible bank financing under the indicated limit or policy. Column (2) is the share of these loans in relation to the maximum permissible bank financing (in percent).

[b] Previous granted limit refers to the number of loans approved under the working capital approach (or old rule); previous official policy refers to the number of loans allowed under the maximum limit of the working capital approach.

Sources: Data from a public sector bank in India and authors' estimates.

Table 6.3 Determinants of the working capital limit and interest rate[a]

	Dependent variable				
	Log (granted limit)			Interest rate	
Independent variables	(1)	(2)	(3)	(4)	(5)
Log (previous granted limit)	0.757	0.540	0.455	−0.198	−0.260
	(0.04)	(0.059)	(0.084)	(0.108)	(0.124)
Previous interest rate				0.823	0.832
				(0.038)	(0.041)
Log (maximum limit as per bank's rule)[b]	0.256				
	(0.042)				
Log (LTB), calculated by the bank		0.145		−0.019	
		(0.036)		(0.102)	
Log (LTB), calculated by authors			0.102		−0.025
			(0.025)		(0.090)
Log (LWC), using turnover projected by bank		0.240	0.279	0.091	0.083
		(0.046)	(0.061)	(0.083)	(0.084)
Log (profits/assets)		0.021	−0.001	−0.048	−0.036
		(0.017)	(0.021)	(0.043)	(0.044)
Dummy for negative profit		−0.037	0.053	−0.045	−0.037
		(0.115)	(0.129)	(0.272)	(0.266)
Log (total net worth/debt)		−0.104	−0.112	−0.064	−0.087
		(0.029)	(0.032)	(0.076)	(0.070)
Log (assets)		0.080	0.143	0.063	0.168
		(0.056)	(0.065)	(0.104)	(0.118)
Log (interest earned/granted limit) for previous year			0.005		
			(0.037)		
Constant	0.011	−0.009	−0.021	2.547	2.180
	(0.079)	(0.154)	(0.195)	(0.749)	(0.843)
R^2	0.952	0.955	0.962	0.878	0.881
Number of observations	298	241	145	198	194

[a] Standard errors in parentheses (corrected for clustering at the account level).

[b] The maximum limit as per the bank's rule is max(LTB calculated by the bank, LWC), where LTB is the limit calculated according to a working capital gap-based method of lending and LWC is the limit on a turnover gap-based method of lending.

Sources: Data from a public sector bank and authors' estimates.

We "unpack" the official limit in column (2), including separately the bank's LTB, LWC, and profits. As in the previous regression, the past loan amount is the most powerful predictor of current loan amount. Both limits enter the regression. Neither profits nor a dummy for negative profits enter the regression. Columns (4) and (5) do the same thing for interest rates—past interest rates are the only significant determinant of current interest rates.

In sum, the actual policy followed by the bank seems to be characterized by systematic deviation from what the rules permit in the direction of inertia.

To the extent that limits do change, what seems to matter is the size of the firm, as measured by its turnover and outlay, and not by its profitability or loan utilization. It could be argued that inertia is actually rational, which results from the fact that the past loan amount picks up all the information that the loan officer has accumulated about the firm that we do not observe. However, at least three reasons exist why this is probably not the case.

- First, firms' financing needs change, if only because of inflation, while loan levels are often constant in nominal dollars.
- Second, the importance of past loans is no different for younger versus older firms, about which the former bank presumably has less information.
- Finally, past loans do not predict future profits, while past profits do. This is important because negative profits predict loan default, while past loans, LTB, and LWC do not.[12]

Conclusion

This section suggests an extremely simple explanation of why many firms in India appear to be starved of credit. Banks seem remarkably reluctant to make fresh lending decisions; in two-thirds of the cases examined here, there is no change in the nominal loan amount from year to year. While lending rules are indeed rigid, this inertia goes substantially beyond what they dictate. Moreover, loan enhancement is unrelated to a firm's profits. Loan officers' indifference to profits is entirely consistent with the rules governing bank lending in India, which do not pay even lip service to the need to identify profitable borrowers. Yet, current profits predict future losses and therefore future defaults, while turnover does not. In other words, a banker who made better use of profit information would likely do a better job at avoiding defaults. Moreover, he would also better identify firms whose marginal product of capital is the highest. Lending based on turnover, by contrast, may skew the lending process toward firms that have been able to finance growth out of internal resources and therefore do not need additional loans nearly as much.

6.4 Understanding lending practices

The abiding puzzle is why the bankers choose to behave in this particular way. The rules are stringent, but rarely bind. Banks decline to lend to firms with very high marginal products of capital. The bank we studied did not lack available funds; between 1996 and 2001, total nominal deposits in our bank grew at an annual rate of 23 percent, while advances grew only 19 percent.

In this section, we report new evidence on three commonly discussed reasons for underlending, summarized as follows:

- First, many feel that because lending officers in PSBs face the wrong incentives, they may be more concerned about making bad loans (and appearing corrupt) than finding profitable opportunities.

- Second, it is suggested that bankers may prefer to make risk-free loans to the government, rather than exert the effort to screen and monitor private borrowers.
- Finally, it is possible that the marginal default rate is high enough to make it unprofitable to increase lending.

6.4.1 Inertia and the fear of prosecution

Since PSBs are owned by the government, employees of these banks are treated by law as public servants and thus subject to government anticorruption legislation. Although the Central Vigilance Commission (CVC), which is charged in India with investigating unscrupulous bank lending practices, argues that honest bankers have nothing to fear, there is an impression among bankers that it is very easy to be charged with corruption if loans go bad. Since bankers face at best weak rewards for making successful loans, they may prefer to simply approve past loan limits, rather than take a new decision.[13]

In the rest of this section, we look at whether there is any evidence for the so-called fear psychosis based on Cole (2002). The basic idea is simple—we ask whether bankers who are "close to" bankers who have been subject to CVC action slow down lending in the aftermath of that particular CVC action.

Specification

We use bank-level monthly lending data to estimate the effect of vigilance activity on lending, using the following equation:

$$y_{it} = \alpha_i + \beta_t + \sum_{k=0}^{w} \gamma_k D_{i,t-k} + \varepsilon_{it}, \tag{6.4}$$

where y_{it} is the (log) credit extended by bank i in month t, α_i is a bank fixed effect, β_t is a month fixed effect, and $D_{i,t-k}$ is an indicator variable for whether vigilance activity was reported by the CVC for that bank i in month $t - k$. Standard errors are adjusted for serial correlation and heteroscedasticity. The basic idea is to compare a bank that was affected by the vigilance activity with other PSBs, before and after the vigilance event. Since it is not clear precisely which event window to use, we let the data decide, estimating models which allow effects of vigilance activity to take from one month to four years to appear.

Data

Monthly credit data by bank were provided by the RBI. Data on frauds are naturally very difficult to come by; but, in an effort to punish corruption through stigma, the CVC has published a list containing the name, position, employing bank, and punishment of the individual officer(s) charged with major frauds. The list consists of 87 officials in PSBs during 1992–2001. Approximately 72 percent of these frauds relate to illegal extension of credit. Summary statistics for credit data and the CVC fraud data are listed in Table 6.4.

Table 6.4 Summary statistics for corruption study

	Mean	Median
Panel A: Credit data[a]		
January 1992 (in 1994 rupee prices)		
Loans, cash credit, and overdrafts	156,943	74,942
	(214,331)	
Log (loans, cash credits, and overdrafts)	16.98	16.65
	(0.830)	
January 2000 (in 1994 rupee prices)		
Loans, cash credit, and overdrafts	296,060	166,431
	(382,644)	
Log (loans, cash credits, and overdrafts)	12.24	12.02
	(0.753)	
Sample size		
Number of public sector banks	27	
Number of months (January 1992–May 2001)	111	
Number of observations	2,997	

Panel B: Corruption data

Yearwise distribution of cases

	1993	1994	1995	1996	1997	1998	1999	2000
Advice	1	4	4	6	10	10	7	9
Order	1	3	2	6	6	7	9	3
Total	2	7	6	12	16	17	16	12

Distribution of content of CVC advice and orders (in percent)

	CVC advice	CVC order
Action		
Prosecution	12.2	0.0
Charge sheet filed	0.0	1.1
Information awaited	0.0	15.7
Dismissal of employee	18.9	24.7
Compulsory retirement	5.6	4.5
"Major penalty"	45.6	2.3
Pay reduction		
Unspecified reduction in pay	4.4	4.5
Reduction in pay 1 grade	2.2	22.5
Reduction in pay 2 grade	7.8	2.3
Reduction in pay 3 grade	1.1	4.5
Reduction in pay 4 grade	2.2	16.9
Reduction in pay 5 grade	0.0	1.1
Total	100.0	100.0

[a] Standard deviations in parentheses.

Sources: Reserve Bank of India (credit data) and Central Vigilance Commission (corruption data); and authors' estimates.

Results

Our estimation results are presented in Table 6.5, showing three similar specifications. Columns (1), (2), and (3) provide estimates for the windows of 1, 12, and 48 months, respectively. Vigilance activity appears to have a clear effect on lending decisions, resulting in a reduction of credit supplied by all the branches of the sample bank by about 3–5 percent. This effect is estimated precisely and is significantly different from zero at the 5 percent level for the contemporaneous effect (column (1)) and at the 1 percent level

Table 6.5 Effect of vigilance activity on credit[a]

	Past activity[c]			Future activity[d]	
Indicator for vigilance activity[b]	(1)	(2)	(3)	(4)	(5)
Indicator for fraud in					
Contemporaneous	−0.055	−0.040	−0.037	−0.042	−0.037
	(0.027)	(0.019)	(0.019)	(0.020)	(0.020)
3 months		−0.039	−0.032	−0.035	−0.031
		(0.018)	(0.016)	(0.016)	(0.016)
6 months		−0.031	−0.023	−0.029	−0.027
		(0.016)	(0.014)	(0.015)	(0.014)
12 months		−0.036	−0.018	−0.018	−0.015
		(0.016)	(0.012)	(0.014)	(0.010)
18 months			−0.028		−0.006
			(0.013)		(0.010)
24 months			−0.012		−0.001
			(0.013)		(0.011)
36 months			−0.014		0.009
			(0.015)		(0.008)
48 months			−0.022		0.022
			(0.028)		(0.015)
Month fixed effects	Y	Y	Y	Y	Y
Bank fixed effects	Y	Y	Y	Y	Y

[a] Columns (1)–(5) present panel regressions of log (credit) extended by 27 public sector banks over a period of 111 months, resulting in 2997 observations. Standard errors (robust to heteroskedasticity and serial correlation) are reported in parentheses.

[b] The independent variable is a dummy variable indicating whether the CVC had charged or punished an officer of a particular bank in a particular month.

[c] Columns (2) and (3) examine how the effect persists over time. In column (2), log (credit) is regressed on dummies to measure the effect of *past* vigilance activity in a bank on lending over the past 1–12 months. For readability, only the coefficients for the contemporaneous effect and 3, 6, and 12 months are reported. Column (3) traces the effects over the past 48 months; again, only coefficients for the contemporaneous effect and select months are reported.

[d] Columns (4) and (5) measure the effect of *future* vigilance activity on lending. For example, the "3 months" coefficient in columns (4) and (5) is a dummy for whether there is vigilance activity at time $t + 3$. Dummies are included for each future month up to 12 months ahead in column (4), and up to 48 months ahead in column (5).

Sources: Reserve Bank of India and Central Vigilance Commission; and authors' estimates.

for the joint parameters of zero to 24 months in columns (2) and (3). It is also quite persistent, appearing in the data at its original level for up to 18 months following the vigilance activity, and only becomes statistically indistinguishable from zero at two years after the CVC decision or judgment.

This economic effect seems to be sizable in terms of the money multiplier. For example, if the overall coefficient of 0.03 were accurate for a bank such as the State Bank of India (SBI)—the largest PSB, providing approximately a quarter of all bank credit in the economy—decisions on whether to pursue vigilance cases could have measurable macroeconomic effects.

Conclusion

There seems to be some evidence that the fear of being investigated is reducing lending by a significant extent—banks where someone is under investigation slow down lending relative to their own mean level of lending. This leaves open the question of whether this is a desirable reaction, since it is possible that the loans not granted are the loans that are unlikely to be repaid. However, it also raises the possibility that honest lenders are being discouraged by excessively stringent regulations.

6.4.2 Lending to the government and the easy life

The ideal way to look at the easy life hypothesis would be to estimate the elasticity of bank lending to the private sector with respect to the interest rate on government securities or the interest rate spread between private loans and government securities. The problem is that the part of the variation that comes from changes in the government yields is that it is the same for all banks and therefore is indistinguishable from any other time-varying effect on lending. In addition, while variation comes from the rates charged across banks, it cannot possibly be independent of demand conditions in a bank and other unobserved time-varying bank-specific factors. Therefore, we cannot estimate the true elasticity of lending by regressing loans on the spread.

Our strategy is to focus on a more limited question, which we hope to answer somewhat more convincingly—are banks more sensitive to interest rates on government securities in a slow-growth environment? We start by identifying the banks that are particularly likely to be heavily invested in the "easy life." For historical reasons, this set of banks has most of its branches in the states that are currently growing slower than the rest. Our hypothesis is that it is these banks that have a particularly strong reason to invest heavily in government securities, since in a slow growth environment, it is harder to identify really promising clients. They also probably have more "marginal" loans that they are willing to cut and reduce, or not increase, when the interest rates paid on government bonds increases. It is therefore these banks that should be particularly responsive to changes in the interest rate paid by the government.

Specification

We define $\text{GROWTH}_{it} = \ln(\text{SDP}_{it}) - \ln(\text{SDP}_{i,t-1})$, where SDP is a moving average of growth rates for the previous three years of state domestic product, with $\text{AVGROWTH}_{it} = \sum_{t-3}^{t-1}(\text{GROWTH}_{il})$. In addition, a bank environment growth index is constructed as the weighted average of the growth rates in the states in which a bank operates, or $\text{BKGROWTH}_{bit} = \sum_{i \in \text{states}} \omega_{bi} * \text{AVGROWTH}_{bit}$, where the weights ω_{bi} are the percentage of bank branches that bank b had in state i in 1980, or $\omega_{bi} = N_{bi}/\sum_{i \in \text{states}} N_{bs}$.[14]

Data

The outcome we focus on is the (ln) credit to deposit ratio (CD) at the end of March of each year for 25 public sector and 20 private sector banks. Two minor PSBs were excluded due to lack of data, while the new private sector banks were excluded for reasons of comparability. The data are from the RBI. For our measure of interest rate spread, we take the difference of the SBI's prime lending rate and a weighted average rate on central government securities (SPREAD).

Results

We test this hypothesis using linear regression. To measure the effect of interest rates and the growth environment faced by banks on lending, we estimate the following equation:

$$\begin{aligned}\ln(\text{CD}_{bit}) = {} & \alpha + \beta * \text{BKGROWTH}_{bit} \\ & + \gamma^{+}(\text{SPREAD}_t * \text{BKGROWTH}_{bit}) * I_{\text{Spread}_t>0} \\ & + \gamma^{-}(\text{SPREAD}_t * \text{BKGROWTH}_{bit}) * I_{\text{Spread}_t<0} \\ & + \theta_i + \varphi_b + \delta_t + \varepsilon_{bit} \end{aligned} \tag{6.5}$$

where α is a constant; $I_{\text{Spread}_t>0}$ ($I_{\text{Spread}_t<0}$) are indicator variables for whether the spread is positive (negative);[15] φ_b is a bank fixed effect; θ_i is a state fixed effect; and δ_t is a year fixed effect. Standard errors are adjusted for serial correlation.

While we see that the credit to deposit ratio is higher in states with more favorable growth rates, we are most interested in the coefficients γ^{-} and γ^{+}, which measure how banks in different growth environments differentially react to changes in the interest rate spread (Table 6.6). The negative and statistically significant coefficient on γ^{+} suggests that banks in high-growth environments substitute toward government securities (and away from bank loans) *less* when the spread falls. We interpret this to mean that banks in low growth states are more sensitive to government interest rates because they

Table 6.6 Interest rate spreads, bank credit, and state growth[a]

	State growth[b]		Synthetic growth index[c]	
	1985–2000	1992–2000	1985–2000	1992–2000
	(1)	(2)	(3)	(4)
Independent variables				
BKGROWTH	1.412	1.538	2.195	2.634
	(0.624)	(1.209)	(0.970)	(1.165)
SPREAD * BKGrowth, when spread > 0	−0.175	−0.137	−0.257	−0.219
(γ^+ in equations (6.5))	(0.110)	(0.119)	(0.104)	(0.103)
SPREAD * BKGrowth, when spread < 0	0.480	0.592	−0.079	0.473
(γ^- in equations (6.5))	(0.521)	(0.405)	(0.791)	(0.562)
R^2	0.46	0.43	0.71	0.63
Number of observations	415	730	402	710
Year fixed effects	Y	Y	Y	Y
State fixed effects	Y	Y	N	N
Bank fixed effects	N	N	Y	Y

[a] Standard errors (robust to heteroskedasticity and serial correlation) are in parentheses.
[b] The growth rate in the state in which the headquarters of each bank is located.
[c] The weighted average of growth rates of states in which each bank operates.

Sources: Reserve Bank of India and authors' estimates.

face less attractive projects to finance, and therefore are more likely to put funds in government securities as returns on these instruments become more attractive.

Conclusion

The evidence seems to be consistent with the view that banks are especially inclined toward the easy life in states where lending is hard because of growth conditions. This suggests that high rates on government securities tend to hurt the firms that are relatively marginal from the point of view of the banks, such as firms in slow growing states and smaller and less established firms.

6.4.3 The risk of default

We report the cumulative default rate for the firms in the sample already in the priority sector in 1997 in Table 6.7, column (1), that is for the small firms referred in Section 6.2. The default rate for these firms averages about 2.5 percent a year during the period 1998–2002—the same rate as reported in earlier studies by Banerjee and Duflo (2001 and 2003). The default rate for firms that come into priority sector in 1997 is reported in column (2), or the big firms in Section 6.2. We see that the cumulative default rate for these firms is lower than that for the small firms in 1997 and remains lower after

Table 6.7 Nonperforming assets of priority sector borrowers at a public sector bank

	Cumulative share of NPAs for small and big firms (in percent)	
Year	Small	Big
1997	0.000	0.011
1998	0.026	0.011
1999	0.052	0.023
2000	0.078	0.057
2001	0.118	0.092
2002	0.125	0.137

Sources: Data from a public sector bank in India and authors' estimates.

these firms are included in the priority sector in 1998. When most of the big firms are once again dropped from the priority sector in 2000, the default rate remains lower than small firms through 2001 but then slightly exceeds small firms in 2002 (by 0.12 percentage points). It is therefore rather implausible that the firms receiving loan enhancements after being included in the priority sector are so much more risky than other firms that their loan limits should not have been increased.

6.5 Conclusion—policy responses

Bank credit in India does not necessarily seem to flow to firms and individuals who have the greatest potential use for it. To correct this deficiency, we first suggest amending lending rules so that they are more responsive to current and future profitability, which we see as a better safeguard against potential NPAs. This is largely because firm profitability seems to be a good predictor of future default. However, choosing the right way to include profits in the lending decision is not easy. If a firm is and will continue to be unprofitable, it makes sense for a bank to cease lending to the firm. On the other hand, cutting off credit to a generally profitable firm suffering a temporary shock may push it into default. The difficulty lies in distinguishing the two. One solution may be to categorize firms into three groups: (i) profitable to highly profitable firms, wherein lending responds to profitability and more profitable firms getting more credit; (ii) marginally profitable to loss-making firms that were recently highly profitable, but have been hit by a temporary shock wherein the existing rules for lending may continue to work well; and

(iii) firms with a long track record of losses, or which have been hit by a permanent shock (e.g. the removal of tariffs for a good in which a major competing economy like China enjoys a substantial cost advantage). For this last group, lending should be discontinued, but also in a way that offers firms a mechanism for resolving NPAs. Of course, it is not always going to be easy to distinguish temporary and permanent shocks, but loan officers should use information from past performance, as well as industry experience as a whole to make this judgment.

Second, we see reason for changing the incentive structure faced by loan officers in approving bank loans, so that fear of reprisal from poor lending decisions does not make them excessively risk averse. Understandably, if loan officers are corrupt, or are afraid to act for fear of appearing corrupt, giving them the additional responsibility discussed above may not be advisable without providing better incentives. A number of small steps may go some distance toward this goal. First, to avoid a climate of fear, there should be a clear separation between investigation of individual loans and investigation of loan officers. A loan should be investigated first; that is, was the originally sanctioned amount justifiable at the time it was given, or were there obvious warning signs. Only if a *prima facie* case can be made that the failure of the loan was predictable, should the loan officer be investigated. The authorization to investigate a loan officer should be based on the most objective available measures of his performance, that is, all previous loan decisions, with weight given both to successes and failures. A loan officer with a good track record should be allowed a number of mistakes (and even suspicious looking mistakes) before he is open to investigation. Banks should also create a division staffed by personnel with strong reputations, who would have a mandate to make some high risk loans. Officers posted to this division should be explicitly protected from investigation for loans made while in this division.

Third, parts of the incentive structure that banks face as a whole should change to increase the availability of bank credit. On the one hand, lower government interest rates appear to have a strong effect on the willingness of bankers to make loans to the private sector. On the other hand, priority sector lending requirements, contrary to popular belief, are not necessarily an inefficient allocation of capital.[16] In fact, these loans appear to have very high marginal products of capital. In addition, while they are slightly more likely to default, the amount of the default is relatively small. Therefore, we see no reason to believe that abolishing priority sector lending will improve bank performance substantially. In fact, it could end up reinforcing the tendency of the banks to make only conservative loans. There is other evidence that suggests that targeted lending programs are effective in other countries, including the United States.[17] Notwithstanding this, we do think that the eligibility criteria for priority sector loans could be rationalized. For example, based on the evidence above, we favor a higher limit for value of plant and machinery in order to be eligible for priority lending. However, the increase could be combined with a time limit on eligibility—after a certain number of years, firms should establish a reputation as reliable borrowers and begin borrowing from the market. A priority sector client that has borrowed from a bank for some time without convincing the bank of his/her creditworthiness is perhaps not worth retaining. Second, the size of the gap between the marginal product of capital and the interest rate suggests the possibility of letting banks charge substantially higher interest rates to the priority sector than they are currently permitted, making it more attractive to lend to the priority sector. This increase could be gradual, making it easier for firms to endure the transition.

Fourth, bank privatization and, in particular, the sale to large multinationals is unlikely to solve the problem of underlending, though it will probably help remove some of the most egregious examples of inaction and surely reduce the degree of overstaffing. It is generally thought that the PSBs are more responsive than private banks to carrying out directives related to social banking. However, analysis of loan-level data reported in Cole (2004) suggests that this may not be a truism; controlling for size, old private sector banks did not lend significantly less to SSI than PSBs (they did lend less to agriculture). On the other hand, regulatory forbearance initially allowed new private sector banks to lend significantly less than targeted levels to priority sector. Even when obliged to meet priority lending requirements, many private banks instead chose to place an equivalent amount of money in low-return government bonds (Business India, 1997). This simply transfers the responsibility to identify and nurture new talent back to the government. Therefore, privatization without stricter enforcement of the priority sector lending requirements could probably end up hurting smaller firms. This is not to say that privatization is an unreasonable option, but rather that it should be accompanied by some efforts to reach out more effectively to the smaller and less well-established firms, not just to ensure more equitable treatment, but also to earn highest returns on capital.

A possible step in this direction would be to encourage established reputable firms in the corporate sector (including multinationals) to set up small specialized companies whose only job is to lend to small firms in a particular sector and possibly in particular locations. In other words, these institutions would be similar to the many finance companies that do extensive lending all over India, but with links to a much bigger corporate entity and therefore greater overall creditworthiness. The banks would then lend to these entities at a rate somewhat below the cost of capital—instead of doing priority sector lending—and these corporate entities, essentially as finance companies, would then on-lend to firms in their domain. By being small and connected to a particular industry, they would have a stronger capacity to acquire detailed knowledge of the firms in the industry and, in turn, would have more incentives to avoid underlending.

Notes

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2. Burgess and Pande (2003).
3. Narasimhan Committee, Government of India (1991).
4. Privatization of banks would almost surely eliminate the problem of overstaffing; but in all likelihood, the government would still have to pay for it through some voluntary retirement scheme, which would be made a condition of the sale.
5. There is a literature on credit constraints in the OECD—see for example Fazarri, Hubbard and Petersen (1998) or Lamont (1997). For more on the theory of credit markets in developing countries, see Banerjee (2003).
6. A similar result holds for the sample of firms which borrowed from the market both before and after the reform, and thus had not completely substituted bank borrowing for market borrowing.
7. Column 1 of Table 6.1 shows that profitablility of firms in the sample with no change in the credit limit were not affected by the reform, suggesting the use of these firms whose loan limits were not changed as a control group to test our identification assumption.
8. The regression presented in column 2 of Table 6.1 is not the actual first stage, because it uses the entire sample. The actual first stage is very similar; the coefficient of the interaction is 0.23 in the sample used in the sales equation.
9. This includes credit from all banks. Following this rule implies that the current ratio will be over 1.33, and the rule is often formulated as the requirement that the current ratio exceeds 1.33.
10. A turnover-based approach is common in the United States, where inventories serve as collateral. In India, inventories do not seem to provide adequate security, as evidenced by high default rates. Second, venture capitalists, who in the United States provide significant financing to promising firms, are largely absent in India. Thus, it may be desirable for banks in India to lend more to profitable firms (as they do not default) and to rapidly growing firms (current rules in India prohibit projecting annual turnover to grow at a rate above 15 percent).
11. Based on Banerjee and Duflo (2001).
12. Banerjee and Duflo (2001).
13. See, for example, Tannan (2001, p. 1579). The latter source quotes a working group on banking chaired by M.S. Verma as saying, "The [working group] observed that it has received representation from the managements and the unions of the banks complaining about the diffidence in taking credit decisions. . . . This is due to investigations by outside agencies on the accountability of staff in respect to some of the NPAs."
14. State domestic product data are from India's Central Statistical Organization; interest rate and branch location data are from the RBI.
15. Because a negative spread occurs only twice and therefore is a quite rare situation (in a perfectly flexible market, banks facing a negative spread should eliminate all credit from their portfolios), we allow a separate coefficient on ($SPREAD_t$ * $BKGROWTH_{bit}$) when the spread is negative.
16. Joshi and Little (1994).
17. Zinman (2002).

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