The Impact of Directed Lending Programs on the Credit Access of Small Businesses in India: A Firm-level Study

Kale, Deeksha

Boston College

12 July 2016

The Impact of Directed Lending Programs on the Credit Access of Small Businesses in India: A Firm-level Study*

Deeksha Kale [†]

July 12, 2016

Abstract

This paper studies the impact of a policy package aimed at increasing access to bank credit of small firms at the national level in India. In 2006, the Government of India expanded the pool of small firms eligible for directed credit under a nation-wide credit program, by changing the criterion that determined the small business status of firms across all industries. Exploiting the expansion in the pool of small firms eligible for directed lending, I analyze the crowding out of previously eligible firms by recently eligible firms. I also study the growth in credit experienced by small firms from sources other than bank credit. I find that recently eligible firms not only disproportionately increased their bank credit stock relative to previously eligible firms, but also increased borrowings from other sources of credit. In other words, I find no evidence of substitution of other forms of credit with bank loans for recently eligible firms.

Keywords: G1, G18, G2

JEL Classification: Banking, Government Policy, Credit Constraints

1 Introduction

Small and medium enterprises (SMEs) around the world contribute immensely to job creation as well as output growth. They provide large scale employment opportunities at a relatively low capital cost compared to larger industries, thereby improving the standard of living of a large proportion of workers. SMEs also play a significant role in the development of new products and new markets, even across the developing world. Beck, Demirguc-Kunt and Levine (2005a) assess the relationship between SME, income inequality and poverty, and find a strong and positive association between the importance of SMEs and GDP per capita growth. Despite their huge contribution to the economy and their potential to grow, SMEs are handicapped by poor productivity due to sub-optimal scale of operation, technological obsolescence and supply chain inefficiencies. They also face other obstacles such as working capital shortages, absence of adequate and timely banking finance, ineffective marketing strategy and increasing domestic and global competition, which result in constraining their expansion and modernization.

Financial impediments, specifically, have a greater impact on the operation and growth of SMEs. According to a World Bank Report in 2014, about 41% of SMEs in the least developed countries reported access to finance as a major constraint to their growth and development, 30% in middle-income countries and 15% in high-income countries. Many studies have observed that access to external finance can significantly enhance the performance of small firms. Access to adequate and timely finance is one of the key factors that determine the ability of a firm to grow. Beck, Demirgüç-Kunt and Maksimovic (2005b) find that the negative impact of credit related obstacles on firm growth is stronger for small firms than large firms and stronger in countries with underdeveloped financial systems.

Given the importance of SMEs, governments and regulators often aim at increasing access to credit for small and micro firms using targeted programs and incentives. Some commonly offered benefits are preferential procurement from the government, loan support via loan guarantees, directed credit programs, subsidies for investment in technical training, assistance with marketing strategies and export sector related incentives. In India, the Micro, Small and Medium Enterprises (MSME) sector is the second largest manpower employer after agriculture, currently employing

over 80 million workers[1]. According to the Fourth Census of MSME conducted between 2006-2009, SMEs contributed about 45% to the value added in the manufacturing sector and constituted about 40% to national exports. MSMEs also play a vital role in the socio-economic uplift of the society, contributing heavily to employment generation and more balanced regional growth. Among the challenges faced by MSMEs in India, the lack of timely and adequate credit is one of the main obstacles for growth for MSMEs. Relatively high cost of credit, requirement of posting collateral and limited access to equity capital often put such firms outside the net of institutional sources of credit. The Government of India has taken a number of measures to improve the credit access of MSMEs as well as to improve productivity and competitiveness of MSMEs.

The focus of this paper is the expansion of a national level directed lending program that mandates all banks in the country to direct 40% of their total annual credit to vulnerable sectors demarcated as *priority sectors*. The Priority Sector Lending program (PSL) was set up to ensure credit access to financially vulnerable sectors such as agriculture, micro and small businesses, low income housing, education and small scale sector exports. Under the program, banks are free to set the interest rate on priority sector loans based on the borrowers' risk assessment[2]. The Reserve Bank of India (RBI) monitors banks' PSL accounts quarter-by-quarter, and checks for shortfall from the PSL target. If banks fall short of the PSL target, they are required to lend the shortfall amount to Rural Development Bonds at an interest rate decided by the Reserve Bank of India. This interest rate is usually close to the bank rate set by RBI on a quarterly basis. If a bank repeatedly falls short of meeting this target, it runs the risk of being disallowed from expanding its branch network across the country.

"Small firm" status in India is determined on the basis of the value of plant and machinery of firms and a predetermined investment ceiling serves as an upper bound that determines "small" status[3]. Any firm with investment in plant and machinery below the decided ceiling is automatically considered a small firm and its bank loans fall under the PSL category. In October 2006, the passing of the Micro, Small and Medium Enterprise Development Act (MSMED)[4] led to a substantial

---

[1] That figure pertains to about 17% of the workforce of India in 2009-2010

[2] Barring few categories - for instance, for extremely small individual loans interest rates are capped.

[3] This definition in terms of the value of plant and machinery corresponds to manufacturing sector firms.

[4] Mandated by the Ministry of Small Scale Industries & Agro and Rural Industries

Figure 1: Bank Credit to Small and Micro Enterprises
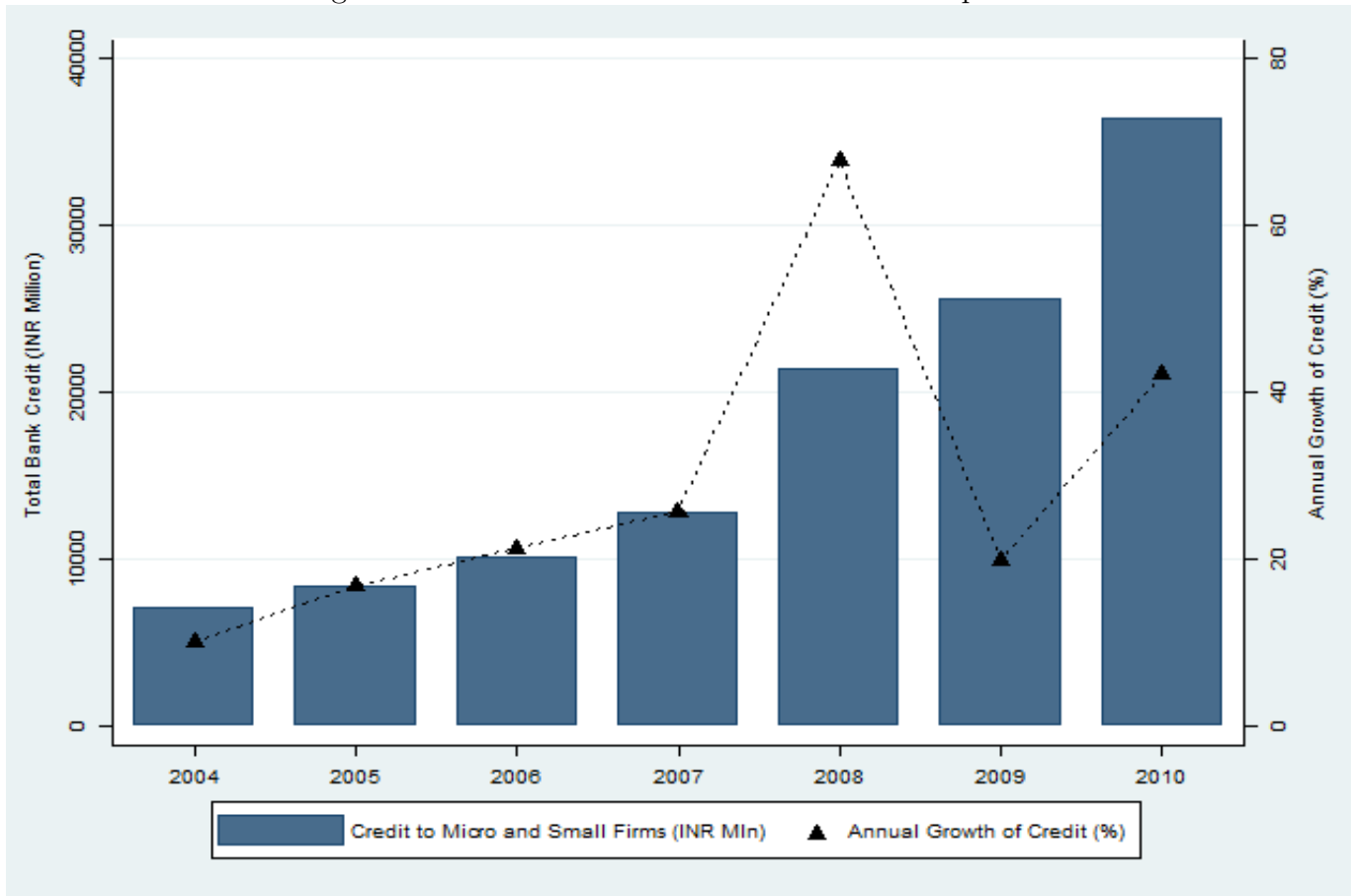
Source: Micro and Small Enterprises Annual Report (2010-2011)

increase in the investment ceiling for small firms, among other policy changes. The revision of the investment ceiling led to an expansion in the pool of small firms eligible for directed lending, thus, improving credit access for the recently eligible small firms (RE firms). Also, as a result there could be a potential increase in the competition for institutional credit for the always eligible small firms (AE firms). The Act also directed the banking sector to achieve a 20% year-on-year growth of loans made to small and medium enterprises and ultimately double the credit available to SMEs in the next five years. According to the Micro and Small Enterprises Annual Report of 2010-2011, bank credit to these firms did more than double between 2006-2007 and 2009-2010. The year-wise rise in bank credit to the sector[5] is shown in Figure 1.

After the enactment of the MSMED Act of 2006, more firms were defined as *small firms* and bank loans made to them fell under the PSL category. Using firms whose eligibility was not affected

---

[5] The jump is partially owing to inclusion of the service sector small firms in the PSL eligible category

by this policy change as the comparison group i.e. the always eligible - AE firms, I study the differential effect of the access to subsidized credit on recently eligible - RE firms. From Figure 2, it is evident that growth in the stock of bank borrowings of RE firms rose by more than 20% compared to AE firms. Most of this effect came in the year following the policy change i.e. in 2008. I find that borrowings from non-bank sources also rose for RE firms, implying that RE firms that received increased bank credit did not substitute other sources of credit with bank loans, and in fact increased overall borrowing post the policy change.

Figure 2: Bank Credit Across the Expanded Pool of Firms
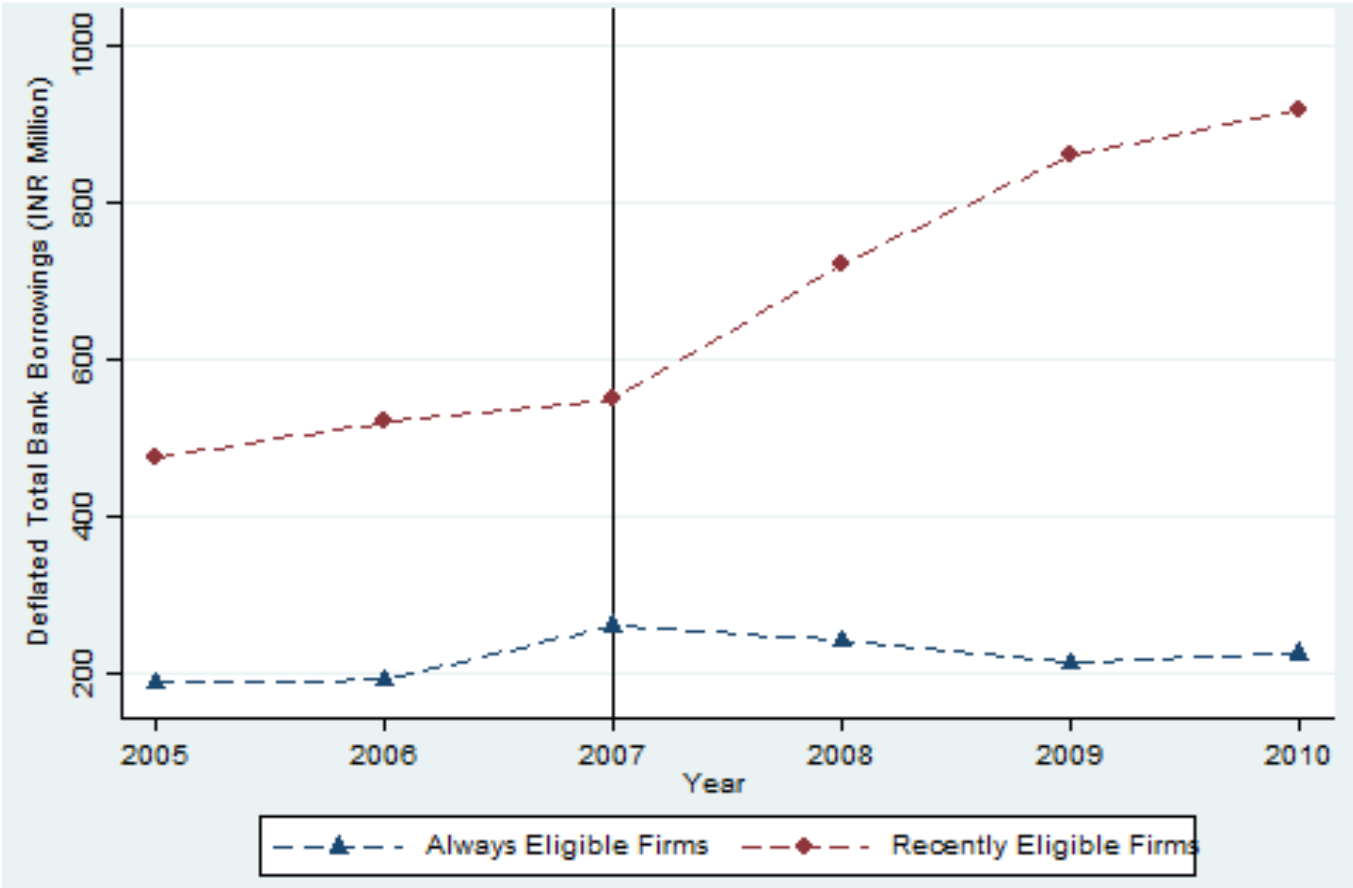
Source: Author's calculations based on firm level data from the *Prowess* database

After the policy change, banks had another avenue to increase their PSL in order to achieve the suggested targets i.e. by lending to the set of firms that were redefined as small firms. These redefined RE firms are by virtue of their size of investment in plant and machinery, bigger than AE firms. Hence, they can post more collateral against bank borrowings. Additionally, being bigger than AE firms, they possibly have an advantage over AE firms in terms of producing detailed

accounts of their business operations and proof of borrowing activity with other creditors. Bank officials, on the other hand, face the choice of achieving growth in SME loans, either by increasing lending to RE firms, or by spreading out the increased lending across both AE and RE firms. If banks preferred to achieve the overall PSL target by disproportionately stepping up credit to RE firms, perhaps because they can achieve targets by making *fewer but bigger loans* to RE firms; AE firms would suffer as a consequence of the policy expansion.

Next, I arrange small firms into buckets according to the level of investment in plant and machinery to study the change in bank borrowings across these buckets. I find that the group of firms just above the new investment ceiling benefited disproportionately relative to all the groups whose plant and machinery investment were below the new ceiling, indicative of a *crowding-out* effect at the investment ceiling. The empirical analysis presented in this paper examines the side-effects of a policy action aimed at increasing credit access to small firms, and if, it had in fact, resulted in hurting the previously eligible, smaller and hence the more vulnerable of the small businesses in the country.

The outline of the paper is as follows: In Section 2, I provide a literature review. Section 3 provides the details of the institutional setting in which banks, firms and regulators function in India. Section 4 describes the choice of the data used for the study. Section 5 describes a basic model of the bank decision to choose between a portfolio of loans to hit its PSL targets. In Sections 6, I explain the empirical strategy and robustness checks. Section 7 contains the results as well as comments on the selection bias or survival bias issue in the study. In Section 8, I provide my conclusions and policy implications.

2   Literature Review

A positive relationship between increased access to finance and firm growth has been established by numerous studies (Rajan and Zingales (1998), Demirguc-Kunt and Maksimovic (1998)). Ayyagari, Demirguc-Kunt and Maksimovic (2008) show that access to finance is the most robust determinant of growth rate of firms across the world, among other important factors such as crime and political instability. Using cross-country firm-level survey data, Beck, Demirgüç-Kunt and Maksi-

movic (2005b) find that among small firms, those reporting lower growth rates are those that face greater financial constraints. Aghion, Fally and Scarpetta (2007) find that access to credit boosts entry among small firms and helps small firms take advantage of growth opportunities especially in growing sectors where large firms would be predominant otherwise.

The differential effect of financial constraints on firm growth across firms of different sizes is also well documented. Most studies suggest that this effect is stronger for smaller firms. Using cross-country survey data from firms of 54 countries, Beck, Demirgüç-Kunt and Maksimovic (2005b) investigate a rich set of obstacles reported by firms of all sizes. The authors find that financing constraints affect firm growth more adversely among small firms relative to large firms. In another study using data on Portuguese firms, Oliveira and Fortunato (2006) find that small firms are likely to grow much faster than large firms when their financial constraints are eased.

Given the importance of small firms in developing as well as developed economies, governments and regulators around the world assume the responsibility of helping these financially vulnerable enterprises by regulating and channeling credit via targeted programs and policies. Credit guarantees, credit subsidies, tax breaks and eased legal requirements are often targeted at specific borrowers such as small exporters, small and medium sized firms, and agricultural workers. This paper empirically analyzes the effect of a policy change aimed at stepping up credit access for small firms in India by way of expanding the pool of eligible small firms. The Government of India has a nationwide program of directed credit facilitated via the banking system. Banks are mandated to lend at least 40% of their annual credit to the financially weaker sections referred to as the *priority sectors*. As a result of this quota, banks are always in search for relatively safe priority sector investment opportunities to reach the 40% target. When loans made to firms with bigger collateral and more financial information become eligible under priority sector lending, banks may unintentionally be incentivized to step up credit only to such bigger enterprises in order to grow their priority sector portfolio, leaving behind the previously eligible small firms.

Many studies have evaluated the effectiveness of similar directed lending programs. Lelarge, Sraer and Thesmar (2010) exploit the extension of guarantees to new sectors in France and find that newly eligible firms raised more external finance at lower interest rates, which subsequently led to an increase in the probability of bankruptcy. Bach (2013) studies a policy of bank loans made

from subsidized funds to specific sectors in France and finds evidence of increased debt financing of targeted small firms, with no subsequent surge in default risk. Banerjee and Duflo (2014) analyze loan-level information of one of the biggest Indian banks. Using a policy reform and a subsequent reversal in policy that decided the eligibility threshold of Indian SMEs between 1998 and 2000, they find large effects of being *prioritized* on firms' bank borrowings, profit and growth. Studies in this area have also documented the adverse or unintended effects of such directed lending policies. Zia (2008) finds that small firms in Pakistan reduce their sales after a reversal of eligibility for subsidized export credit while large, listed and group firms did not suffer as a result. Cole (2009) finds evidence of political cycles in agricultural lending via such programs in India. A working paper by Kumar (2014) documents the credit misallocation across agricultural and manufacturing sectors in India due to the presence of political cycles in bank lending. In another working paper, Bhue, Prabhala and Tantri (2016) find evidence of a strategic slowdown in growth of investment in small firms near the investment cut-off, thereby defeating the very purpose of such close targeting.

In this paper, I explore the potential *spillover effects of policy expansion* of PSL eligible small firms to include *bigger* small firms[6], thereby affecting the distribution of directed credit across RE and AE firms in India.

3   Institutional Setting

3.1   The Indian Banking Sector

India's banking system is organized into Commercial, Regional Rural and Co-operative Banking. Both public[7] and private banks (domestic and foreign) fall under the Commercial Banking category. Public banks are bifurcated into the State Bank Group and the Nationalized Bank Group. The Reserve Bank of India (RBI) is the central bank of India. As of 2016, the banking system consisted of 26 public sector banks (controlling 72% of banking assets), 25 private sector banks (controlling 21% of banking assets), 43 foreign banks (controlling 7% of banking assets), 56 development focused regional rural banks, 1,589 urban cooperative banks and 93,550 rural cooperative banks.

---

[6] 'Bigger' by way of higher investment in plant and machinery.
[7] The government is the majority shareholder of public banks which comprise about 70% of the market

3.2 Priority Sector Lending

All commercial banks in India (including public sector banks) are mandated to direct 40% of their total annual credit to sectors demarcated as priority sectors such as agriculture, micro and small enterprises and other weaker sections of the society. This nation-wide directed lending program is referred to as Priority Sector Lending program (PSL). Over the years, the list of eligible category of loans under PSL has been expanded to include low income housing, education loans, export credit and renewable energy sector. The RBI annually updates and announces the sectors which are eligible as priority sectors. It also informs banks about internal targets to be met in addition to the overall 40% target, and about limits associated with loans to priority sectors that will actually qualify as PSL. Shortfall from announced targets is closely monitored by the RBI officials. In recent years,PSL Certificates have been used as a support mechanism for banks not able to fulfill the quota. These instruments incentivize *PSL surplus banks* to sell their excess PSL achievement of the 40% target to *PSL shortfall banks*.

3.3 Preferential Credit Status for SMEs

The priority sectors include those sectors that impact large sections of the population, the weaker sections of the society and the sectors which are employment-intensive such as agriculture, and micro and small enterprises. Loans to micro and small enterprises across all industries count as part of priority sector advances for all commercial banks in India. However, banks are not subject to an internal target in terms of the share of PSL credit that comprises loans to micro and small enterprise. The mandatory PSL advances for domestic banks is 40% of their annual net credit and for foreign banks it is 32% of their annual net credit. Any shortfall from the above limit is to be invested at very low interest rate in agencies that lend to above category. Table 1 presents the targeted sectors prescribed for banks. These targets are announced and updated by the Reserve Bank of India by way of circulars published annually.

Table 1: Priority Sector Lending Targets at Sector and Sub-sector Level

Sector	Sub-Sector Target	Regulatory Internal Target
Agriculture	-	18%
Weaker Sections	-	10%
Micro and Small Enterprises (MSE)		No Overall MSE Target
	Micro Enterprises (Group I)	40% of MSE
	Micro Enterprises (Group II)	20% of MSE
	Small Enterprises	-
Total Priority Sector		**40%**

Note: Micro Enterprises Group I and II correspond to micro firms with investment in plant and machinery upto INR 0.5 Million and between INR 0.5-2.5 Million, respectively.

One of the major bottlenecks to the growth of SMEs in India is access to finance. Regulators understand the importance of banks as the dominant channel for providing external funds to these firms, especially given the inability of MSMEs to access capital markets. To ensure fair distribution of credit to all segments, targets within the sub categories are provided. Although there is no internal target within the overall 40% PSL target for the small and micro enterprise group, there are sub-targets in place for the share of credit to micro enterprises. Of the total advances made towards micro and small enterprises, 60% must be made to micro enterprises. Even within this 60% mandated share, there are restrictions imposed to ensure that the most financially vulnerable micro enterprises[8] would not be crowded out by other categories. No such safeguard is in place for the small enterprises.

3.4 The MSMED Act of 2006

The regulatory change that I exploit in this study is the MSMED Act of 2006. In October 2006, the Parliament of India enacted the Micro, Small and Medium Enterprises Development Act[9]. The Act provided a variety of facilities such as improved credit access, skill and training development, technology upgradation, market linkages and marketing support.

After the MSMED Act 2006 was enacted, more firms became eligible under PSL by being

---

[8] firms with investment in plant and machinery upto INR 0.5 Million

[9] A different set of rules were laid out for manufacturing sector and service sector. This study focuses on small enterprises in the manufacturing sector. Capital investment cut-offs for firms were determined by different rules for service and manufacturing sector small firms since investment in plant and machinery is not a good indicator of the size of a business in the service sector.

categorized as *small firms*. The revision of the investment ceiling led to an expansion in the pool of *small firms* eligible for directed lending, thus, improving credit access for the recently eligible small firms (RE firms). The always eligible firms (AE firms) continued to remain eligible even after the Act was passed. Table 2 contains the details of these definitions.

Table 2: Investment Limits Determining Small or Micro Enterprise Status

Firm Size	Cut-off Before Policy Change (Before 2007)	Cut-off After Policy Change (After 2007)
Micro Enterprise	0.5 - 2.5	0.5 - 2.5
Small Enterprise	2.5 - 10	2.5 - 50

Note: The cut-off value of investment in plant and machinery is in INR Million.

4   Guiding Loan Decision Model

To Be Completed

5   Data

5.1   Firm-level data

The data for this study are from the *Prowess* database of the Centre for Monitoring Indian Economy (CMIE). The database provides the most detailed firm level data compared to other sources. It covers over 18,000 manufacturing formal sector firms. It provides financial information from audited annual reports, as well as stock and credit rating data compiled from other published sources.

It also contains detailed data on financial variables such as bank borrowing, total financial institutional borrowing, and secured and unsecured debt. The coverage of the *Prowess* database is extensive. *Prowess* covers firms that account for about 75 % of corporate taxes and 95% of the excise duty collected by the Indian government. The database records data using uses audited financial statements. Any changes made to methodology are applied across years to keep variables in the accounts comparable. Prowess also classifies firms by industry according to the NIC code[10], which is the Indian equivalent of the SIC classification scheme. Due to its coverage and accuracy, the database has been increasingly used in research related to the Indian industrial sector.

An alternate source of data is the Annual Survey of Industries (ASI), used by researchers to study manufacturing sector firms in India. The ASI data are compiled based on surveys at the factory level, which may not be representative of the firms' financial variables. The ASI does not allow tracking within firm-level time series of most financial variables that are necessary for this study. Moreover, the ASI data does not provide firms' bank borrowing data at factory level or the plant and machinery data across the entire sample. Bank loan officers are more likely to use audited financial data to calculate the cut-offs determining firm size i.e. whether a firm is small, medium or large by definition[11].

5.2   Summary Statistics

In this study, I use six years of time series data from 2004-2009 on *small* manufacturing firms.[12] The firm level variables I use are total sales, total assets, total fixed assets, total liabilities, total borrowings, bank borrowings, profitability ratio, utilization ratio, current ratio and quick ratio.[13]

The descriptive statistics of the sample of firms are presented in Table 3. All the financial variables correspond to the financial year 2006-2007. I construct the two groups of firms i.e. the AE small firms and the RE small firms. I assign a firm in one of those categories based on the value of its investment in plant and machinery in that year. If the value of plant and machinery

---

[10] I use the industry code at the 2-digit level for my study.

[11] This fact was confirmed with officials at the RBI as well as with the managers of two Indian banks - State Bank of India and Axis Bank.

[12] Due to changes in interest rate regulation in 2010-2011, it is reasonable to not go beyond 2009-2010.

[13] The definitions of the financial variables used in this study are provided in the appendix.

of a firm is between INR 2.5-10 Million, its in the AE small firms category, and if its between INR 10-50 Million then its in the RE small firms category.[14]

In the financial year 2006-2007, the average sales of AE small firms is about three-fourths of the average sales of RE small firms. The average investment in fixed assets for AE firms is less than half of that of RE small firms. The average profitability and utilization seem almost uniform across RE and AE firms. I have reported EBIT, as well as current and quick ratios which are indicative of firm default risk. An interesting fact to note is that on average, bank borrowings of the two groups do not differ by a lot, although the total borrowings of AE firms is close to half of that of RE firms. This indicates the higher dependence of AE firms on bank credit.

Table 3: **Descriptive Statistics (in INR Million)**

Variable	N	Mean	Median	Std Dev	Min	Max
Always Eligible						
Total Sales	335	195.79	51.50	626.41	0.10	8444.20
Total Assets	385	201.81	60.20	889.76	0.50	14963.90
Fixed Assets	385	39.52	19.80	68.88	3.10	899.80
Total Liabilities	385	201.81	60.20	889.76	0.50	1,963.90
Total Borrowings	319	83.12	13.50	558.76	0.00	9372.80
Bank Borrowings	243	72.55	11.30	550.45	0.00	8219.70
Profitability	377	0.07	0.06	0.24	-0.97	3.47
EBIT	377	16.75	2.50	60.10	-50.60	709.50
Utilization	335	1.17	0.93	1.26	0.00	10.10
Current Ratio	379	6.11	1.70	27.66	-1.33	388.53
Quick Ratio	379	6.22	1.36	26.02	0.00	338.87
Recently Eligible						
Total Sales	757	294.02	103.10	998.36	0.00	24683.80
Total Assets	842	380.31	97.25	1,915.88	3.90	35154.00
Fixed Assets	842	89.86	54.85	211.24	12.50	3297.30
Total Liabilities	842	380.31	97.25	1,915.88	3.90	35154.00
Total Borrowings	761	167.23	33.80	1,355.20	0.00	29932.20
Bank Borrowings	624	81.82	21.30	563.09	0.00	13510.20
Profitability	831	0.07	0.06	0.27	-3.86	3.84
EBIT	831	29.06	5.80	117.10	-69.30	1913.30
Utilization	757	1.20	0.97	1.10	0.00	9.66
Current Ratio	834	4.08	1.73	19.76	0.00	495.00
Quick Ratio	834	3.15	1.17	13.52	0.00	254.00

Notes: The data pertains to the financial variables in the financial year 2006-2007.

---

[14] With exception of 41 items covering broad groups of Hosiery, Hand Tools and Pharmaceuticals, whose investment cut-off was enhanced to USD 1.25 Mln in 2001. I exclude these sectors from this study.

6 Empirical Strategy

Selection of Comparison Groups

SME credit related policies often target particular regions or specific production activities, and along the way, extend or withdraw support depending on the growth of such firms. The particular policy change I exploit is the expansion of the investment cut-off that determined if a firm qualified as a 'small' firm, thereby gaining access to loans under the directed lending program. This policy expansion brought firms across all industries, regions and ownership types, under the PSL category. Such variation allows for the estimation of aggregate exposure to the program, by comparing firms across sectors in the AE and RE groups. Unlike most other countries where firm size is determined by number of full-time employees on the the firms' payroll, in India it is determined by the nominal investment in plant and machinery (excluding land and buildings). This method of size characterization limits the use of accounting tricks to subvert the intent of the process[15].

To study the effect this policy change had on firm growth and firm borrowing, I analyze the differential effect across AE and RE firms, before and after the policy change[16] I do not include micro enterprises in the AE firms group even though they have been always eligible for loans under PSL. The reason is that they are too small and not comparable to small firms. They do not pass the pre-trend test of no significant difference in trends. Moreover, due to the internal subgroup targeting among micro firms, a certain percentage of small business loans is always directed to micro enterprise firms.

Selection of Timing of Policy Change

Since the MSMED Act of 2006 was passed midway through the financial year[17] in September, 2006, I use the following financial year (2007-2008) as the first year post the policy change. In order to maximize the firms available as a panel, I use data on the two groups of firms that starts in 2004, up until 2009. I stop the time line at 2009 owing to a change in the loan interest rate setting regime,

---

[15] In the absence of any agency that determines the small firm status based on investment in fixed assets per the MSMED Act of 2006, I use the data from audited financial statements which bankers are more likely to rely.

[16] This methodology only allows for an *intent-to-treat* estimate.

[17] The financial year in India runs from April 1 - March 31

and owing to the introduction of a credit guarantee scheme designed for small enterprises. These regulatory changes were targeted at easing credit terms for small enterprises all across India, and applied special benefits towards *smaller* loans even among the pool of small business loans. Such policy changes are likely to distort the true picture of the *crowding-out* of AE firms.

Selection of the Data

I focus on analyzing the credit growth of firms in the SME sector before and after the implementation of the MSMED Act of 2006. I compare the bank borrowings of newly eligible small firms with the always eligible firms (RE and AE firms, respectively), since the expansion in investment ceiling for small firms was expanded. The ideal data to study the potential crowding out of smaller borrowers is studying bank-loan account level composition and credit terms across AE and RE borrowers. However, with the change in firm size definition, bank loan accounts also recassified loans to 'small', without any way to identify AE borrowers from RE borrowers.

Effect of the Policy Change

The firms that form my comparison group are the ones whose eligibility was not affected by the policy change. Using this comparison group, I study the differential effect of expansion of subsidized credit on newly eligible firms. After the policy change, banks have another avenue to increase their PSL and achieve suggested targets by lending to the set of firms that are now by definition small firms. Since these firms are *bigger* than the set of previously eligible firms, they can post more collateral per loan. The banks can potentially achieve growth in PSL lending to small businesses by making fewer, big loans to RE firms or by making more loans to both the groups AE and RE firms.

The interesting effect to explore post such a policy action is the presence of a bias in the lending composition of banks, away from AE firms and towards RE firms. Under the assumption of a fixed cost of monitoring or a fixed cost of establishing firm-bank relationship, I expect the banks to favor stepping up loans made to the RE firms. AE firms are smaller compared to RE firms by virtue of size-based definition. A lot more small ticket loans would have to be made in order to cover the

directed lending quota as well as achieve the growth in small business lending, compared to bigger loans that can be now made to RE firms. Bigger collateral and more detailed financial records of RE firms could bias banks' loan decisions in terms of which firms' credit they want to step up. I seek out evidence of such *crowding out* controlling for firm and industry level demand side trends.

In essence, I am using a difference-in-difference strategy to estimate the impact of increased lending to small firms by exploiting the quasi natural experiment provided by the regulatory change that increased their investment ceiling, thereby making more firms eligible to apply for loans under PSL.

Survivor Bias

I study a panel of firms whose financial variables are available from 2004-2010. The final sample consists only of firms for whom data was reported every year and as a result, only those firms that survived the entire period. From an econometric point of view, the results of this study are applicable for the firms that survived during this period. Since I choose the AE as well as the RE group of firms using the same criterion, it seems fair that I interpret the results as the effect of the policy change on the most stable firms.

To Be Completed

6.1 Econometric Specification

The main dependent variable I use is the rate of growth of bank borrowings. I check the robustness of the results using the assets scaled bank borrowings. I use the following specification:

$$\Delta y_{ist} = \boldsymbol{\beta_0} + \boldsymbol{\beta_1} \times (RE_i \times After_t) + \boldsymbol{\beta'} X_{it} + \gamma_i + \delta_t + \theta_s \times t + \epsilon_{ist} \tag{1}$$

where Δy_{ist} is the change in log of deflated bank borrowings. The indicator RE_i is equal to 1 if the firm belonged to the newly eligible category in the year 2006-2007. The indicator $After_t$ is equal to 1 if the year is after the financial year 2006-2007, the year of passing the Act. The firms controls I use are utilization, profitability, collaterizability of assets and a default risk proxy. A

detailed description of these variables are available in the appendix in the Appendix Section 10.2. I include firm fixed effects and and year fixed effects in my regression. I also include industry-year[18] effects that control for industry specific time trends that may affect borrowing. All level variables are deflated using the wholesale price index. Following Bertrand, Duflo, and Mullainathan (2004) in their treatment of clustering at the level of treatment for difference-in-difference type estimation, I cluster standard errors at the level of the treatment status i.e. firms[19].

Following the literature, I have focused on the first difference in logs of deflated bank borrowings, since bank borrowing is a stock variable and is known to be persistent with fat-tailed distributions. For similar reasons, I use this transformation in the other outcomes as well.

The coefficient of interest is β_1 which captures the relative differential effect in terms of growth of bank borrowings, due to the change in eligibility of firms into PSL across the Always Eligible and Recently Eligible firms. Because of year fixed effects and industry-year trend controls, the estimation of the impact of the policy change accounts for common trends in the demand and supply of debt and for time varying structural differences among industries in the demand and supply of debt.

Further, I allow the effect to vary by year to determine which year bank lending increases the most, controlling for all variables previously controlled for. I use the following specification:

$$\Delta y_{ist} = \beta_0 + \sum_{t=2006}^{t=2009} \beta_t \times RE_i + \beta' X_{it} + \gamma_i + \delta_t + \theta_s \times t + \epsilon_{ist} \tag{2}$$

In order to check if recently eligible firms simply used bank borrowings to substitute for other financing, I run the same regressions with change in growth of other borrowings (other than bank borrowing) as well as change in growth of total liabilities.

$$\Delta y_{ist} = \beta_0 + \beta_1 \times (RE_i \times After_t) + \beta' X_{it} + \gamma_i + \delta_t + \theta_s \times t + \epsilon_{ist} \tag{3}$$

---

[18] 3 digit NIC industry codes are used to categorize industries

[19] I try to cluster standard errors at the industry level but find that the firm level clustering produces the most conservative standard errors.

where the dependent variable is the change in log of deflated borrowings other than bank loans *or* total liabilities reported by firms. The controls are the same as the main regressions.

Again, the coefficient of interest is $\boldsymbol{\beta_1}$ which captures the relative differential effect of the change in eligibility of firms on growth of non-bank borrowings and growth of total firm liability.

Using collateral based groups to assess impact

In order to investigate if the differential effect varies based on the distance of the firm's level of investment in plant and machinery from the eligibility ceiling of INR Million 50, I divide the sample into five groups based on their value of plant and machinery in 2006-2007:

- Group 1: INR Million (2.5-10)

- Group 2: INR Million (10-20)

- Group 3: INR Million (20-30)

- Group 4: INR Million (30-40)

- Group 5: INR Million (40-50)

I use the following specification to study the differential impact of the policy change across these groups constructed by slabs of plant and machinery investment of firms.

$$y_{ist} = \boldsymbol{\beta_0} + \sum_{g=2}^{g=5}\boldsymbol{\beta_g}\times\mathbb{1}[Group = g]\times After_t + \boldsymbol{\beta}'X_{it} + \gamma_i + \delta_t + \theta_s\times t + \epsilon_{ist} \tag{4}$$

where the coefficient $\boldsymbol{\beta_g}$ on the interaction terms captures the differential effect across the groups *two* through *five*, relative to the base group *one*, which is the AE small firms group. As in the earlier regressions, I include year fixed effects and industry-year trend controls, which control for common trends in the demand and supply of debt and for time varying structural differences among industries in the demand and supply of debt.

6.2 Robustness Checks

Using levels of bank borrowing as dependent variable

As a robustness check, I use the level of bank borrowings scaled by one period lagged assets as my dependent variable. The control variables is the same as in the main regressions.

$$\frac{Y_{ist}}{Assets_{t-1}} = \beta_0 + \beta_1 \times (RE_i \times After_t) + \beta' X_{it} + \gamma_i + \delta_t + \theta_s \times t + \epsilon_{ist} \tag{5}$$

Similar to the year-by-year exercise in regression (2), I include year-by-year effects.

$$\frac{Y_{ist}}{Assets_{t-1}} = \beta_0 + \sum_{t=2006}^{t=2009} \beta_t \times RE_i + \beta' X_{it} + \gamma_i + \delta_t + \theta_s \times t + \epsilon_{ist} \tag{6}$$

7 Results

7.1 Effect of the policy change on growth of bank borrowings

Table 3 presents the results from estimating Equation (1) with and without including industry-year trend effect on the sample of previously eligible and recently eligible small businesses. Expanding the privileged eligibility of priority sector lending to a new set of firms increases their bank debt growth by 23% compared to the previously eligible firms. The only firm level control that is statistically significant is the default risk, proxied by the current ratio of the firm.

Table 4 presents the results from equation (2). I use interactions of the RE firms group and the year across the time period 2004-2009 to investigate the difference in trends between the two groups. This is another way of testing for unobservable time trends across the two firm groups (AE and RE firms). After controlling for industry-year fixed effects, I find a 26% difference among the two groups' rate of growth in bank loans in the year 2008[20]. The difference for the years before the policy change are not statistically significant, confirming the absence of different trends.

---

[20] The year after the year of the policy change

7.2 Effect of the policy change on growth of non-bank debt

In Table 5, I look at the impact of the policy change on all non-bank borrowings as well as on total liability of all firms in the sample. The coefficient on the differential growth in non-bank debt and on total liability is positive (about 5% and 11%, respectively), albeit not significant in statistical terms. This indicates that there was no significant substitution between bank borrowing and other kinds of debt held by firms, and that the Recently Eligible firms were using the additional funds to increase overall funding.

7.3 Effect of the policy change on scaled bank borrowings

As a robustness check, I run the same specifications as in Equation (1), including linear industry trends and firm and year fixed effects or with the level of bank borrowings scaled by assets. I run the specification given by Equation (4). I find that controlling for all fixed effects and industry trends as before, the bank borrowings of RE firms were 26% higher relative to the AE firms. As before, I use year-by-year interactions and find that 2008 was the year where the difference is first seen to be positive and statistically significant. These results are shown Table 7.

7.4 Effect of the policy change on growth of bank borrowings interacted with collateral group

In Table 8, I study the effect of policy change on firms' bank borrowings between 2004-2009 across more bifurcated groups as explained in Section 6.2. I find that in terms of difference in rate of growth of bank debt the only group dummy whose coefficient is positive and statistically significant is of the group just above the cut off. These results, however, must be interpreted with caution since they may be driven by selection bias. Since I only study firms that are in the panel between 2004-2009 and those that report all financial statements annually, its possible that selection of the smaller firms is biased towards stronger firms. In the second column of Table 8, I find that each of the groups above the old cut-off experienced a growth in bank loans, with the strongest effect in Group 3 (investment INR Million 20-30) and Group 4 (investment INR Million 30-40), about 36% and 32%, respectively.

8 Conclusion

I exploit a change in the eligibility criterion of small firms to a nation-wide directed lending program in India to analyze crowding out of previously eligible firms by the recently eligible small firms. After an increase in the investment cut-off determining small size status of firms, I find that the firms that were included in the pool of program eligible borrowers, enjoyed the privilege of much more credit geared towards them by commercial banks. This increased lending did not act as a substitute for other forms of lending, which also systematically rose during the years studied.

This study points to an important spillover effect of the policy change that was aimed at the increasing credit access to bigger enterprises via eligibility to directed lending. Policymakers must keep in mind the side-effects of such a change in terms of leaving *smaller* of the small firms worse off. One way to get around such unintended effects would be to set internal targets for banks in terms of which size of loans should generate the increase in SME credit growth.

References

Aghion, Philippe, Thibault Fally, and Stefano Scarpetta, "Credit constraints as a barrier to the entry and post-entry growth of firms," *Economic Policy*, 2007, *22* (52), 732–779.

Ayyagari, Meghana, Asli Demirguc-Kunt, and Vojislav Maksimovic, "How important are financing constraints? The role of finance in the business environment," *The World Bank Economic Review*, 2008, *22* (3), 483–516.

Bach, Laurent, "Are Small Businesses Worthy of Financial Aid? Evidence from a French Targeted Credit Program," *Review of Finance*, 2013, p. rft022.

Banerjee, Abhijit V and Esther Duflo, "Do firms want to borrow more? Testing credit constraints using a directed lending program," *The Review of Economic Studies*, 2014, *81* (2), 572–607.

Beck, Thorsten, Asli Demirguc-Kunt, and Ross Levine, "SMEs, growth, and poverty: cross-country evidence," *Journal of economic growth*, 2005, *10* (3), 199–229.

_ , **Asli Demirgüç-Kunt, and Vojislav Maksimovic**, "Financial and legal constraints to growth: Does firm size matter?," *The Journal of Finance*, 2005, *60* (1), 137–177.

Bhue, Gursharan, Nagpurnanand Prabhala, and Prasanna Tantri, "Do Programs Mandating Small Business Lending Disincentivize Growth? Evidence From a Policy Experiment," 2016.

Cole, Shawn, "Fixing market failures or fixing elections? Agricultural credit in India," *American Economic Journal: Applied Economics*, 2009, pp. 219–250.

Demirguc-Kunt, Asli and Vojislav Maksimovic, "Law, Finance, and Firm Growth," *The Journal of Finance*, 1998, *53* (6), 2107–2137.

Kumar, Nitish, "Political interference on firms: Effect of elections on bank lending in India," Technical Report, Working paper, University of Chicago 2014.

Lelarge, Claire, David Sraer, and David Thesmar, "Entrepreneurship and credit constraints: Evidence from a French loan guarantee program," in "International differences in entrepreneurship," University of Chicago Press, 2010, pp. 243–273.

Oliveira, Blandina and Adelino Fortunato, "Firm growth and liquidity constraints: A dynamic analysis," *Small Business Economics*, 2006, *27* (2-3), 139–156.

Rajan, Raghuram G. and Luigi Zingales, "Financial Dependence and Growth," *The American Economic Review*, 1998, *88* (3), 559–586.

Zia, Bilal H, "Export incentives, financial constraints, and the (mis) allocation of credit: micro-level evidence from subsidized export loans," *Journal of Financial Economics*, 2008, *87* (2), 498–527.

9 Tables

Effect of policy change on newly eligible RE firms' bank loans

$$\Delta y_{ist} = \beta_0 + \beta_1 \times (RE_i \times After_t) + \beta' X_{it} + \gamma_i + \delta_t + \theta_s \times t + \epsilon_{ist}$$

Table 3: Effect of policy change on firms' bank borrowings (2004-2009)

Variable	(1)	(2)
$RE_i \times After_t$	0.100	0.232***
	(0.075)	(0.091)
sales-assets ratio$_{it}$	0.0001	0.0001
	(0.0001)	(0.0001)
ebit-assets ratio$_{it}$	-0.079	-0.076
	(0.058)	(0.057)
collateral proxy$_{it}$	0.027	0.029
	(0.024)	(0.025)
default risk proxy$_{it}$	0.004***	0.003**
	(0.001)	(0.001)
Number Of Observations	3,030	3,030
Industry-Year Trends	No	Yes
Firm & Year Fixed Effects	Yes	Yes

*** $p<0.01$, ** $p<0.05$, * $p<0.1$
Standard errors are reported in parenthesis.

Notes: The dependent variable is the change in log of deflated bank borrowings. The indicator RE_i is equal to 1 if in the year 2006-2007 the firm belonged to the newly eligible category. The indicator $After_t$ is equal to 1 if the year is after the financial year 2006-2007, the year of passing the Act. Controls for firm utilization, profitability and collaterizable assets are the total assets, EBIT ratio and value of plant and machinery scaled by deflated fixed assets. I use the change in current ratio as a measure of the default risk of the firm. All level variables are deflated using the WPI. Standard errors are clustered at the firm level (most conservative standard errors).

Year by Year Effect of Policy Change

$$\Delta y_{ist} = \boldsymbol{\beta_0} + \sum_{t=2006}^{t=2009} \boldsymbol{\beta_t} \times RE_i + \boldsymbol{\beta}' X_{it} + \gamma_i + \delta_t + \theta_s \times t + \epsilon_{ist}$$

Table 4: Year by year effects of policy change on firms' bank borrowings

Variable	(1)	(2)
$RE_i \times (Year = 2006)$	-0.112	-0.046
	(0.105)	(0.105)
$RE_i \times (Year = 2007)$	-0.239**	-0.133
	(0.116)	(0.120)
$RE_i \times (Year = 2008)$	0.109	0.260*
	(0.120)	(0.135)
$RE_i \times (Year = 2009)$	-0.184	-0.002
	(0.125)	(0.153)
Number Of Observations	3,030	3,030
Industry-Year Trends	No	Yes
Firm & Year Fixed Effects	Yes	Yes
All Firm-level Controls	Yes	Yes

*** p<0.01, ** p<0.05, * p<0.1
Standard errors are reported in parenthesis.

Notes: All variables are defined exactly as described in the previous table.

Effect of policy change on RE firms' other borrowings

$$\Delta y_{ist} = \boldsymbol{\beta_0} + \boldsymbol{\beta_1} \times (RE_i \times After_t) + \boldsymbol{\beta'} X_{it} + \gamma_i + \delta_t + \theta_s \times t + \epsilon_{ist}$$

Table 5: Effect of policy change on firms' other borrowings (2004-2009)

Δy_{ist}	Other Borrowings	Total Liabilities
$RE_i \times After_t$	0.049	0.108
	(0.030)	(0.066)
sales-assets ratio$_{it}$	0.00002	0.0001
	(0.00002)	(0.00004)
ebit-assets ratio$_{it}$	0.085	-0.034
	(0.025)	(0.057)
collateral proxy$_{it}$	0.010***	0.008
	(0.009)	(0.041)
default risk proxy$_{it}$	-0.001	0.002
	(0.001)	(0.001)
Number Of Observations	3,568	3,796
Industry-Year Trends	Yes	Yes
Firm & Year Fixed Effects	Yes	Yes

*** p<0.01, ** p<0.05, * p<0.1
Standard errors are reported in parenthesis.

Notes: The dependent variable is the change in log of deflated borrowings other than bank loans *or* total liabilities reported by firms. The indicator RE_i is equal to 1 if in the year 2006-2007 the firm belonged to the newly eligible category. The indicator $After_t$ is equal to 1 if the year is after the financial year 2006-2007, the year of passing the Act. Controls for firm utilization, profitability and collaterizable assets are the total assets, EBIT ratio and value of plant and machinery scaled by lagged deflated fixed assets. I use the change in current ratio as a measure of the default risk of the firm. All level variables are deflated using the WPI. Standard errors are clustered at the firm level (most conservative standard errors).

Effect of policy change: Interaction with collateral group

$$Y_{ist} = \beta_0 + \sum_{g=1}^{g=5} \beta_g \times \mathbb{1}[Group = g] \times After_t + \beta' X_{it} + \gamma_i + \delta_t + \theta_s \times t + \epsilon_{ist}$$

Table 6: Effect of policy change on firms' bank borrowings (2004-2009)

Variable	Δy_{ist}	$\frac{Y_{ist}}{Assets_{t-1}}$
$Group(10-20) \times After_t$	0.344***	0.239**
	(0.103)	(0.121)
$Group(20-30) \times After_t$	0.179	0.357**
	(0.114)	(0.152)
$Group(30-40) \times After_t$	0.198	0.315**
	(0.132)	(0.135)
$Group(40-50) \times After_t$	0.151	0.246**
	(0.104)	(0.109)
Number Of Observations	3,030	3,225
Industry-Year Trends	Yes	Yes
Firm & Year Fixed Effects	Yes	Yes

*** p<0.01, ** p<0.05, * p<0.1
Standard errors are reported in parenthesis.

Notes: The dependent variable is the change in log of deflated borrowings or the deflated bank borrowings scaled by lagged deflated fixed assets. The groups are formed by value of reported plant and machinery in the year 2006-2007, and the base group is the Always Eligible Firms group (2.5-10). the controls are the same as in previous regressions with Δy_{ist} and $\frac{Y_{ist}}{Assets_{t-1}}$ as the dependent variable.

Robustness Check: Effect of policy change on RE firms' bank loans

$$\frac{Y_{ist}}{Assets_{t-1}} = \boldsymbol{\beta_0} + \boldsymbol{\beta_1} \times (RE_i \times After_t) + \boldsymbol{\beta}' X_{it} + \gamma_i + \delta_t + \theta_s \times t + \epsilon_{ist}$$

Table 7: Effect of policy change on firms' bank borrowings (2004-2009)

Variable	(1)	(2)
$RE_i \times After_t$	0.163**	0.257**
	(0.087)	(0.104)
sales-assets ratio$_{it}$	0.001***	0.0001***
	(0.0003)	(0.0002)
ebit-assets ratio$_{it}$	-0.196	-0.188
	(0.432)	(0.38)
collateral proxy$_{it}$	0.691***	0.689***
	(0.103)	(0.096)
Number Of Observations	3,227	3,227
Industry-Year Trends	No	Yes
Firm & Year Fixed Effects	Yes	Yes

*** p<0.01, ** p<0.05, * p<0.1
Standard errors are reported in parenthesis.

Notes: The dependent variable is the deflated bank borrowings scaled by lagged deflated fixed assets. The indicator RE_i is equal to 1 if in the year 2006-2007 the firm belonged to the newly eligible category. The indicator $After_t$ is equal to 1 if the year is after the financial year 2006-2007, the year of passing the Act. Controls for firm utilization, profitability and collaterizable assets are the total assets, EBIT ratio and value of plant and machinery scaled by lagged deflated fixed assets. I use the change in current ratio as a measure of the default risk of the firm. All level variables are deflated using the WPI. Standard errors are clustered at the firm level (most conservative standard errors).

Robustness Check: Year by Year Effect of Policy Change on bank loans

$$\frac{Y_{ist}}{Assets_{t-1}} = \boldsymbol{\beta_0} + \sum_{t=2006}^{t=2009} \boldsymbol{\beta_t} \times RE_i + \boldsymbol{\beta}' X_{it} + \gamma_i + \delta_t + \theta_s \times t + \epsilon_{ist}$$

Table 8: Year by year effects of policy change on firms' bank borrowings

Variable	(1)	(2)
$RE_i \times (Year = 2006)$	0.043	0.056
	(0.127)	(0.135)
$RE_i \times (Year = 2007)$	0.014	0.065
	(0.141)	(0.163)
$RE_i \times (Year = 2008)$	0.247	0.357*
	(0.156)	(0.195)
$RE_i \times (Year = 2009)$	0.111	0.236
	(0.163)	(0.216)
Number Of Observations	3,227	3,227
Industry-Year Trends	No	Yes
Firm & Year Fixed Effects	Yes	Yes
All Firm-level Controls	Yes	Yes

*** p<0.01, ** p<0.05, * p<0.1
Standard errors are reported in parenthesis.

Notes: All variables are same as described in the previous table.

10   Appendix

10.1   Variable Definitions

1. Total Sales is the sum of industrial sales and income from non-financial services.

2. Total assets refer to sum of all current and non-current assets held by a company as on the last day of an accounting period.

3. Fixed assets refer to assets held with the intention of being used for manufacturing goods or providing services. Fixed assets are not held for sale in the normal course of business. Fixed assets have long useful economic life and are mostly expected to be used in more than one accounting period. Gross fixed asset is the historical cost of the asset without any adjustments for depreciation.

4. Total Liabilities of a company is the sum of all the resources deployed by it. It includes all sums it owes to the shareholders in the form of share capital and reserves surpluses, all sums it owes to its lenders in the form of secured and unsecured loans and all current liabilities and provisions. It also includes deferred tax liability.

5. Total borrowing includes all forms of debt; interest bearing or otherwise. All secured and unsecured debt is included under total borrowings (so total borrowings include debt from banks (short-term and long-term) and other financial debt issued by financial institutions, government, RBI, syndicated loans, etc.

6. Bank Borrowings are bank loans - All types of loans in the form of short-term loans,long term loans, cash credits, bank overdrafts, etc. are treated at par and all are clubbed under this category bank borrowing.

7. Profitability ratio is the difference of profits after tax and long-term bank borrowing (which are bank loans having a maturity of more than 12 months) to assets.

8. EBIT - Earnings or profit before Interest and Taxes

9. Utilization refers to the measure of fixed assets performance i.e. ratio of total sales to lagged fixed assets of the firm.

10. Current Ratio is a liquidity ratio that is used to measure a companys ability to meet its short term obligations, i.e. to pay off its short term liabilities.
A ratio below one implies inadequacy and a ratio just above one would indicate a just-about adequate ability to meet current liabilities. But, a ratio that is much above one would indicate too much of short term asset on hand that could possibly be deployed for better long-term use.

11. Quick Ratio is the ratio of quick assets to quick liabilities. It measures the ability of a company to pay its immediate or short term liabilities by using its cash and near cash current assets. It is a more stringent measure of short term liquidity as compared to the current ratio.

10.2 Firm level controls

I scale all the level variables with lagged firm fixed assets since these are all manufacturing firms and their principle source of revenue generation is proxied by investment in fixed assets.

1. Utilization: Total Sales scaled by assets

2. Firm Profitability Ratio: (EBIT -Depreciation -Amortization) scaled by assets

3. Default Risk Proxy: I try to control for the firms' ability to pay back debt using Current and Quick Ratio.

4. Collateralizable Assets: I use the investment in plant and machinery to control for level of output generating as well as collaterizable assets. Banks in India prefer to use machinery instead of land as collateral.