Financing Constraints in the Crisis: Evidence from a Temporary Lending Program in Sweden

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ABSTRACT

We use a novel government policy, launched in Sweden in March 2009, to evaluate the consequences of financing constraints during a crisis. The policy is unique in that it allowed firms to temporarily suspend payment of their labor taxes, but any unpaid taxes were treated as a loan from the Swedish government. Moreover, the interest rate on the loan was set relatively high so as to appeal *only* to firms whose options for external finance disappeared. About 2,500 firms took advantage of the policy, effectively borrowing around five billion Swedish Krona ($640 million U.S. dollars) in aggregate. We match information on firm use of the lending facility with micro-level data on the entire universe of Swedish limited liability firms. We show that: i) net debt levels increased for the firms taking advantage of the program, indicating they used the program to relieve financing constraints rather than to substitute for alternative financing sources, and ii) the funding supplied by the policy supported real investment and employment growth during the crisis. Taken together, our findings highlight the important impact financing constraints had on real activity during the crisis and show that the Swedish lending facility had a robust mitigating impact on these constraints, thereby supporting entrepreneurial activity in a time of adverse financial conditions.

Keywords: Financing constraints; Financial crisis; Entrepreneurship; Small firms
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1. Introduction

A number of recent studies explore the importance and impact of financing constraints in the financial crisis (e.g., Campello, Graham, and Harvey (2010), Duchin, Ozbas, and Sensoy (2010), Ivashina and Scharfstein (2010), and Iyer, Peydró, and Schoar (2014)). Yet we know relatively little about the consequences of short-term policies designed to alleviate the constraints arising from temporary but deep adverse shocks to the financial sector. Numerous programs around the world attempt to mitigate firm financing constraints over the long-run (e.g., Bach (2014), Banerjee and Duflo (2014), Lelarge, Sraer, and Thesmar (2010), and Lerner (1999)), but these programs typically take the form of government grants, subsidies, and targeted loans, and thus are not intended to meet immediate liquidity needs. In this paper we study a novel policy in Sweden targeted specifically at the potentially acute financing constraints arising from the credit freeze in late 2008 and early 2009. The policy allowed firms to postpone paying labor taxes and instead treat any unpaid taxes as a loan on the balance sheet. However, the rate on the loan was set sufficiently high (an APR of around 5%) so as to discourage firms that were not liquidity constrained from taking the funds. This policy is effectively a short-term lending facility that differs in many ways from other policies aimed at alleviating firm financing difficulties – in particular, it is not a grant with an application process, it is available to many different types of firms, and it is temporary.

We study the impact of the Swedish lending facility on financing, investment, and employment at the firm level. The novel features of this policy allow us to evaluate both the real consequences of financing constraints and the potential for short-term liquidity provisions to at least partially mitigate those constraints. Moreover, since we have detailed micro-level data for the entire universe of limited liability firms in Sweden – which consists largely of unlisted, private firms – this setting offers insights on the consequences of financing constraints and the effectiveness of external liquidity provisions potentially missing

from studies focused only on large, publicly traded firms. Our main findings are: i) firms using the lending facility appear to face significant financing constraints during the crisis, ii) access to the lending facility substantially mitigated these constraints, and iii) the proceeds from the loan were used for real activity, including capital investment and employment growth.

The lending facility was available to essentially all Swedish limited liability corporations, though the amount of funding that was available differed across firms based on the size of their monthly wage bill. Labor taxes are paid every month in Sweden and a firm that decided it needed more liquidity simply reported so on the form for that month, thereby immediately accessing the funds. The only restriction on the loan was that the firm could not have a payment default at the debt collector's office (0.03% of the firms). Once the firm decided to use the lending facility all it had to do was to take up the amount of postponed taxes as an interest bearing liability on its balance sheet. Thus, accessing the lending facility required very little time and effort from the borrowing firm.

Our empirical analysis uses consolidated balance sheet and income statement information for all Swedish firms provided by Statistics Sweden during 2007-2010. The data covers around 140,000 firms per year. Besides using the full sample of firms, we also conduct tests using only the sample of firms that made use of the lending facility, and we construct a matched sample in order to obtain the best possible measure of a counterfactual development had not the lending facility been in place. Given the setup of the lending facility, loans are not randomly assigned across firms. The firms taking the loan have, on average, less cash flow and higher leverage, but higher rates of investment and more growth options. For the purpose of evaluating the effect of the lending facility we need to compare outcomes among the firms using the lending program to outcomes for a group of firms that are otherwise as similar as possible. Since the amount of funding available to each firm is a function of the amount of

labor taxes it pays, there is one potentially exogenous determinant of whether firms select in or out of lending program. We thus construct a control set of firms from the group of firms for which the lending facility provided little or no potential funding.

Specifically, we use information on firm-level wage payments to construct a proxy each firm's total loan capacity, and then we perform exact matching on observable financing variables between the firms using the lending facility and the set of firms in the bottom quartile of loan capacity to total assets. We select matching variables from the financing constraints literature (e.g., Hadlock and Pierce (2010), Kaplan and Zingales (1997), Lamont, Polk, and Saá-Requejo (2001), and Whited and Wu (2006)). This approach gives us a control group of firms that is virtually identical in key observable dimensions – e.g., cash flow, leverage, and investment opportunities – but simply was not in a position to obtain significant funding from the lending program.

Our main empirical tests are based on the approach Banerjee and Duflo (2014) use to evaluate a directed lending program in India. In the first test we evaluate whether the firms using the lending program increase overall levels of debt. If the loan firm takes the loan and simply substitutes it for private debt then this indicates two things: i) the loan simply serves as a subsidy with no real effects, and ii) the firms using the lending facility may not be financially constrained. But if we observe an increase in overall borrowing by the firm, then we can conclude that the loan firm is indeed financially constrained (Banerjee and Duflo (2014)). After exploring potential debt effects we turn to whether there are real economic effects from the lending program. Finally, we focus only on the firms that used the lending program and explore whether debt growth and real activity are sensitive to the amount of funding that the lending program provided.

We estimate a variety of regression specifications across both the whole sample and the matched sample and in each case find a significant positive differential increase in debt in the loan firms. These results provide strong, direct evidence that firms accessing the lending program faced binding financing constraints during the 2009-2010 period. Next, we use the same general samples and specifications to test whether the loan firms had differentially higher rates of capital investment and employment growth during the time they had access to the lending facility. Consistent with the findings for debt growth, accessing the lending facility is associated with differentially higher rates of capital investment and, at least in some specifications, higher employment growth. The results for employment growth are stronger if we eliminate the very smallest firms and focus only on firms with more than two employees. Further, we find a strong positive link between the amount of funding a firm received from the lending facility and subsequent rates of debt growth, fixed capital investment, and employment growth.

Our results add to a prominent set of studies that evaluate the real outcomes of financing constraints. We point to three particular contributions of our work. First, our study provides a unique perspective on the kinds of firms that are financially constrained. If we interpret our evidence on firm use of the lending facility as self-revealing the presence of binding financing constraints, then we can identify the factors most associated with financing constraints when looking at a much broader set firms than in the typical study using just publicly listed firms. Using this perspective, we find that a firm is more likely to take the loan if it has relatively higher sales growth, leverage, and capital expenditures, and relatively lower cash flow and age. Interestingly, larger firms are more likely to make use of the lending facility. These results suggest that the intersection of growth opportunities and financial resources are key to understanding who is constrained, and they show that some proxies for constraints widely used the literature – namely firm size – may not be appropriate when

looking beyond the sub-set of publicly listed companies used in most studies. One reason for the weak relation between firm size and financing constraints in an economy-wide sample of firms is that almost all firms in such samples are "small" by conventional measures. Moreover, if the majority of small business owners that comprise such a broad sample have little interest in expanding (e.g., Hurst and Pugsley (2011)), firm size alone will be a poor predictor of financing difficulties. Of course, in this case, to the extent that payroll taxes are relatively less important (as a share of assets) for smaller firms, then the structure of the lending facility can partially explain why larger firms were more likely to take advantage of the program.

Second, the insights from studying the lending facility's impact on financing constraints add to the literature on entrepreneurial finance (e.g., Kerr and Nanda (2009)). Since our sample covers the whole universe of limited liability firms in a country, it is comprised largely of truly entrepreneurial firms (e.g., as in Robb and Robinson (2014)). Though the likelihood a firm uses the lending facility is increasing in firm size (at the margin), the firms using the lending facility are almost exclusively very small privately held firms. For instance, the average financially constrained firm in Hadlock and Pierce's (2010) sample has a book value of total assets of around 350 million US dollars, which is small relative to other publicly listed US firms but not at all small in an absolute sense. In sharp contrast, the average book value of total assets among the loan firms in our sample is roughly 680,000 US dollars (or SEK 5.2 million).

Finally, our evidence adds to the literature evaluating the effects of various financial aid programs targeted at mitigating financing constraints (e.g., Banerjee and Duflo (2014) and Lerner (1999)). We add to this literature by showing that financial policies designed solely for transitory and potentially severe financial market disruptions can have economically important effects.

2. Institutional design and data

2.1 The law of the postponement of labor taxes

In the aftermath of the credit crunch in the final quarter of 2008, the Swedish parliament passed the law of the postponement of labor taxes (SFS 2009:99). The law was passed on February 26 of 2009, went into effect on March 9, 2009, and was administered by the Swedish tax agency. The purpose of the law was to offer firms a temporary liquidity boost by allowing them to postpone paying two months' worth of labor related taxes for up to one year. Labor related taxes are due monthly and they are a part of firms' labor expenses. In the context of the lending facility, labor related taxes comprise employees' income taxes, social security payments, and payroll taxes. Given that labor related taxes are relatively high in Sweden, postponing two months' worth of these payments represented a potentially substantial short-run liquidity boost. All loans were charged an interest rate corresponding to 5.3% per annum and were due to be paid in full by January 2011. Thus, the policy was designed to assist firms facing temporarily severe financing constraints, not subsidize firms with ample internal cash flows or bail out firms in financial distress.[4] In accounting terms, firms that postpone their tax payments incur a liability that shows up on the firm's balance sheet.

The loan program has several interesting properties. First, by targeting a firm's labor taxes rather than profit taxes, the lending facility does not require the firm to be profitable in order to access the funds. Thus, by giving even unprofitable firms a respite from their labor costs, the program does not exclude the firms that are perhaps most likely to be financially constrained. However, since the funding available through the program is a function of payroll taxes, there is substantial heterogeneity across firms in the extent to which firms can

[4] This is also stressed in the administration's proposal that accompanies the law (prop. 2008/09:113): The law aims to assist firms that are fundamentally healthy but due to temporary lack of lending face liquidity constraints (a translation from the law proposal which is in Swedish).

benefit from policy. Second, since the lending facility was accessible through the monthly labor tax form it was straightforward for the firm to access the funds and for the tax agency to administer the loan. The estimated cost of administration is SEK 4.5 million (~580,000 dollars), or just SEK 258 per loan (~33 dollars). Third, the interest rate was set so as to not crowd out other kinds of loans. It is of course difficult to assess the market interest rate at which the loan firms could have borrowed. However, the interest rate in March 2009 reported in the monetary financial statistics (MFI) for corporate loans below 1 million EUROs was equal to 2.34 percent.[5] Given the substantially higher rate on lending facility funds, it is unlikely that firms would find it profitable to merely substitute market loans with the government loans. Indeed, our findings below suggest that firms did not use the funds to simply pay down prior debts.

2.2 *Sample*

We use a comprehensive database that has information on all limited liability companies in Sweden.[6] This database is constructed from firms' corporate income tax filings and contains balance sheet and income statement information. It also includes information on a number of other firm characteristics, including whether the firm is publicly listed, the number of workers it employs, and its primary industry classification. The initial data is at the (unconsolidated) company level. In order to achieve better comparability with other studies that largely use consolidated accounting data for entire firms (e.g., Compustat), we consolidate the company data using information available in the database on corporate ownership structure. We follow the literature and exclude financial and regulated firms. We also exclude firms that report having no employees. The final sample comprises about 140,000 corporations per year. Using the consolidated corporation data, we refer to each

[5] Description: http://www.ecb.europa.eu/stats/money/interest/interest/html/index.en.html
[6] The database is called FRIDA it is maintained by Statistics Sweden. For privacy reasons we cannot see firms' real names or actual unique identifier, but we can track the same firm over time.

consolidated corporation as a "firm" in the text. Finally, we focus primarily on the period 2007-2010, giving us two years of data prior to the initiation of the lending facility.

Our second source of data provides information on the firms that applied for the loan. This data is maintained by the Swedish tax agency (Skatteverket). The firm-level database provides a unique identification number for each firm enabling us to match the information on firm use of the lending facility to the firm-level dataset described above. In the final sample roughly 2,500 firms used the lending facility.

3. Who took the loan?

3.1 Loan firms versus no loan firms: Summary statistics

Table 1 illustrates the key differences between the firms that used the lending facility (*Loan firms*) and all other firms in the economy (*Other firms*). We report average values of key firm characteristics for *Loan firms* and *Other firms* over three different time intervals: 2007-2010 (the full sample period), 2007-2008 (the pre-crisis period), and 2009-2010 (the crisis period). All variables are winsorized at the 1% level before computing the averages reported in Table 1.

The first part of the table reports sample averages for the annual change in debt to total assets (*Debt growth*), capital expenditure normalized by beginning of period total assets (*CAPX*), and the annual change in employment (*Employment growth*). These are the outcome variables we focus on later in the study. *Loan firms* tend to exhibit substantially faster debt growth, capital investment, and employment growth throughout the sample period. The one notable exception is that average employment growth is larger for the *Other firms* in 2009-2010 period.

The next six rows in Table 1 report a set of variables commonly used in the financing constraints literature as predictors of financing constraints (e.g., Hadlock and Pierce (2010)). In each sample period, the *Loan firms* have lower cash flows relative to assets (*Cash flow*), higher leverage in terms of total debt to total assets (*Debt*), lower cash holdings to assets (*Cash*), lower dividends to total assets (*Dividend*), and higher sales growth defined as annual log change in sales (*Sales growth*) compared to the no loan firms. The *Loan firms* also tend to be slightly younger than the *Other firms*, though the differences in age are not statistically significant. These outcomes are consistent with the idea that *Loan firms* much more likely to face binding financing constraints than the firms that did not participate in the lending program. In particular, while *Sales growth* (a proxy for growth opportunities) is increasing rapidly for the *Loan firms*, they have fewer internal resources and likely possess less unused debt capacity given their relatively high debt ratios. Moreover, for firms not taking the loan, sales growth is negative and the average level internal cash flow is more than twice as large as the average level of capital investment (*CAPX*) in each of the sample periods, suggesting that they have sufficient internal funds to more than cover investment opportunities, even in the crisis period.

We proxy for firm size with the size of the wage bill, in part because the loan amount depends on amount of labor taxes that the firm pays. Firms using the lending facility have significantly larger wage bills than other firms. To the extent that use of the lending facility indicates the existence of financing constraints, it might seem surprising that the loan firms are larger on average. There are two reasons why size works differently in our study compared to previous work on financing constraints. First, we have a sample that comes closer to containing the entire population of firms in a country, the vast majority of which are very small private firms. As an example from the literature, the average firm size in the more constrained sample in Hadlock and Pierce (2010, p. 1917) is 350 million US dollars in total

assets. A firm of that size would (easily) be \in the top quintile in firm size in our sample. Thus, though *Loan firms* are larger than *Other firms,* in an absolute sense they are still quite small. Second, firms with very low wage bills had little reason to participate in the lending program since the amount of funding that firm had access to depended directly on the amount of payroll taxes it paid.

The final three variables in Table 1 are more directly related to the loan program. First, we compute a proxy for the maximum amount of funding each firm could have obtained from the lending facility. This amount corresponds to roughly 9% of the firm's annual wage payment. We thus take 9% of the annual wage bill, normalize by total assets, and call the variable *Loan capacity*. Most importantly, the difference in *Loan capacity* in the pre-crisis period (i.e., columns (3)-(4)) is relatively large in favor of the loan firms. Specifically, average *Loan capacity* in 2007-2008 for the firms using the lending facility is roughly 9% of total assets, whereas for the no loan firms it is around 6%. Notably, for the firms using the lending facility, loan capacity is slightly larger than annual cash flows and only marginally smaller than their stock of cash reserves. Thus, for at least some firms, the potential funding offered by the lending facility was non-trivial.

We compare average interest cost per unit of debt (*Interest cost*) for the loan firm and other firms. Average *Interest cost* is almost a full percentage point higher for the loan firms during the full four-year sample period. However, the average interest cost for loan firms is *below* the interest rate charged by the lending facility (5.3%). Though the *Interest cost* variable reflects the average cost of past borrowing, rather than the marginal cost of obtaining new funds, the rate charged by the lending facility does not appear to be particularly cheap for the average loan firm.

Finally, we present information on the size of the loans accessed from the lending facility and relate it to total assets (*Loan amount*). The average *Loan amount* is 0.069 (and the median is 0.038), which is roughly comparable to the loan firms' average cash flow over the full period, and larger than their average cash flow during the crisis years. This magnitude is also sufficient to explain how *Loan firms* increase leverage during the crisis years when both internal sources of finance decline (e.g., average *Cash flow* falls by 0.045 and average *Cash* by 0.038). We discuss the actual loan amounts and distributions in more detail below.

3.2 Firm size, Loan capacity, financial factors, and the lending facility

To illustrate the sharp heterogeneity in use of the lending facility across firms of different size, we sort the whole sample into quartiles based on number of workers and *Loan capacity* in 2008. In Figure 1a we report the number of firms from each of these quartiles that use the lending facility, and in Figure 1b we report the share of all firms in a quartile that take a loan. In terms of size, the bottom 25% of firms only have one employee, and the next 25% of firms have just two employees, so half of all the firms in our sample are tiny firms. In Figures 1a-1b we focus only on the 2,133 firms taking the loan in 2009 (another 368 took a long in 2010). The figures show that very few of the firms in the smallest size quartiles used the lending program. For example, Figure 1a shows that just 193 out of the 2,133 loan firms come from the bottom half of the size distribution, and Figure 1b shows that in the bottom two quartiles of the firm size distribution only 0.3% and 0.4% of firms, respectively, took out the loan.

Most of the loan firms come from the top two quartiles in firm size and loan capacity. The third size quartile consists of firms with between 3-6 employees, and this quartile accounts for more than double the number of loan firms compared to the bottom half of firms (453 total). But by far the most important quartile for loan firms is the top quartile (seven or

more employees), which accounts for almost 70% of all loan firms. Together, the largest two size quartiles account for over 90% of all loan firms. Nonetheless, as Figure 1b shows, in the top two quartiles of firm size, just 1.6% and 5.2% of firms used the lending facility. Though the frequency of participation in the loan program is slightly less concentrated in the top quartile when we look at quartiles of loan capacity rather than quartiles of firm size, the patterns are generally similar.

We point to two key takeaways from this discussion. First, by analyzing the entire universe of limited liability firms in an economy, there is a considerable skewness in firm size. Most firms are very small and half of all firms have between 1-2 employees. Second, since the lending facility was a function of payroll tax payments, it simply was not relevant for the many micro firms that populate an economy.

Next, we examine how different types of firms within each *Loan capacity* quartile made use of the lending program. We split each *Loan capacity* quartile into "high" and "low" firms based on *Dividend*, *Cash flow*, and *Debt* and compile the results in Figures 2a-2c. In Figure 2a we split firms based on dividends and it is evident that, within each loan capacity quartile, high dividend firms are considerably less likely to use the lending facility compared to the firms that do not pay dividends. This is expected, since use of the lending facility should be determined by the intersection of loan capacity and the need for external funding, and the existence of a dividend payout signals that firms are not financially constrained. Similarly, Figure 2b shows that within each loan capacity quartile, firms with low internal cash flows (bottom quartile) are more frequent users of the lending facility than firms with high cash flows (top quartile). The rationale here is that firms with ample internal financial resources are *ex ante* less likely to demand the lending facility compared to firms with less internal finance, regardless if they are in a high *Loan capacity* quartile. Finally, in Figure 2c we carry out the same exercise but instead compare high and low *Debt* firms with the

expectation that high leverage firms are more constrained than low leverage firms. Indeed, across all loan capacity quartiles almost none of the low debt firms make use of the lending facility.

Overall, these figures show that use of the lending facility is not solely a function of a given firm's loan capacity. Rather, the need for external funding appears to play a key role as well. These findings line up well with the summary statistics in Table 1, and are generally consistent with a financing constraints motive for the firms participating in the lending program. Next we turn to multivariate evidence on the factors that drive firm participation in the lending program.

3.3 Predictive regressions of who took the loan

In Table 2 we report results from a logit regression specification that uses an indicator for whether or not the firm took the loan as the dependent variable. We use data from 2008 and test the relative predictive power of the firm characteristics described in Table 1. In column (1) we use all firms in the sample, which results in around 130,000 observations. The probability that a firm takes the loan in 2009-2010 (based on 2008 firm characteristics) increases with leverage, size of the wage bill, sales growth, loan capacity to total assets, and interest costs to total debt, and the probability decreases with cash flow, firm age, cash holdings, and dividends. These outcomes are consistent with the descriptive statistics discussed above, and provide further support for the idea that firm use of the lending facility was driven in an important way by financing considerations. As before, the only characteristic that does not behave as in the financing constraints literature is firm size (which we proxy by size of the wage bill), as most studies in this literature find that small firms tend to face more severe financing constraints (e.g., Hadlock and Pierce (2010)). However, as discussed above, our sample differs markedly from the typical sample of publicly traded

Compustat firms and the nature of the lending facility is such that small firms with trivial wage bills benefited little from the program. Indeed, the positive association between *Wage bill* and the likelihood that firm's use the lending facility diminishes considerably, and ultimately becomes statistically insignificant, once we drop the smallest firms from the sample.

In the final three columns we report regression results for sub-samples of relatively larger firms. Though the micro firms that comprise the vast majority of economy-wide firms are interesting to consider for other reasons, we want to consider how firm characteristics associate with use of the lending facility within the sub-sample of firms that have non-trivial levels of employees and stood to benefit most from the lending facility. In column (2) we exclude all firms that are not a part of the top quartile in firm size in 2008, i.e., firms with less than 7 employees. The sample size drops to around 31,000 and the fraction of loan firms increases to 5.2%, but the results are almost identical in all ways compared to the full sample in column (1). In the final two columns we focus on firms with 20 or more employees and 50 or more employees respectively. The sample sizes fall dramatically to slightly below 10,000 firms and to around 3,000 firms in the final column. In the regressions using the smallest sample of relatively large firms (column (4)), the coefficients on firm age, dividends, and the wage bill are no longer statistically significant, but all of the other estimates are consistent with the full sample results. To the extent that making use of the lending facility directly indicates that firms are financially constrained, the findings in Tables 1 and 2 shed light on the types of firms most constrained in a crisis. Namely, it is the firms with significant growth options (high *Sales growth*), limited internal funding (low *Cash* and *Cash flow*), and high levels of *Debt*.

3.4 The size of the loan

The total number of unique firms taking the loan is 2,501. We present more detailed descriptive statistics on firm use of the lending facility in Table 3. A total of 2,133 firms took the loan in 2009 to a value of 4.46 billion Swedish Krona (SEK). Using the local currency conversion unit provided by the World Bank, this amount corresponds to 583 million US dollars. In 2010, another 888 firms took the loan. Of these firms, 368 did not take any funds in 2009, while 520 had already used the lending facility to some extent in 2009. Overall, the total amount of funds accessed from the lending facility is 4.88 billion SEK (641 million dollars). Out of the 4.88 billion, 2.36 billion went to three major corporations.

As noted above, a proxy for firm-level loan capacity (the most the firm could obtain from the lending program) is roughly 9% of the annual wage bill. Using this proxy, the aggregate loan capacity of the 2,133 firms in 2009 is 5.95 billion SEK. This means that in aggregate the firms used 75% of their potential loan capacity. However, there is considerable variation across firms in the absolute size of the loan. On the first row, the average loan amount in 2009 is 2.06 million SEK (270,000 dollars), but this value is inflated by the presence of the three large firms that made extensive use of the lending facility. The median loan value is considerably smaller – just 228,133 SEK (~30,000 dollars). The figures in columns (8)-(11) show slightly less skewness on the fraction of loans accessed out of total loan capacity. Though we only have a proxy for loan capacity, the average loan is around 61% of capacity, the median is actually higher at just under 66%, and the 75^{th} percentile is almost 0.80. Together, these values show that there is substantial variation in use of the lending facility among the firms that access loan funds, a point we return to more formally in the tests that follow.

In panel B of Table 3 we break up the firms into size quartiles. As suggested by Figure 1a, firms in the bottom half of the size distribution account for a very small share of the aggregate loan funds that were utilized. Specifically, only 17 million SEK out of the 4.45 billion SEK loan funds accessed in 2009 are taken by firms in the bottom half of the size distribution. It is of course expected that firms with smaller wage bills obtain less loan funding, but there are also very few of these firms that bothered to access the loans. However, the different size cohorts do not differ much in the ratio of loan funds accessed to loan capacity. The mean loan total as a share of loan capacity (column (8)) is around 0.60 for all size cohorts, whereas the median is around 0.65.

In Table 4 we sort the loan firms into quartiles based on *Loan capacity* and report descriptive statistics on the *Loan amount* for firms in each capacity quartile. Not surprisingly, firms with higher *Loan capacity* borrowed substantially more from the lending facility. For example, across all firms (column (1)), the average (median) *Loan amount* is 0.069 (0.038), but among the firms in the bottom quartile of *Loan capacity*, average *Loan amount* is just 0.026 (column (2)). At the other extreme, the average (median) *Loan amount* for firms in the highest *Loan capacity* quartile is 0.170 (0.109). These results, together with the descriptive evidence reported earlier, show that very few firms with low *Loan capacity* bothered to use the lending facility, and when they did use it they obtained little in the way of substantive funding.

4. Identification strategy and methodology

Our interpretation of the setup of the lending facility is that it intended to target financially constrained firms, particularly firms that were financially constrained as a consequence of the financial crisis. In order to evaluate whether indeed the firms taking the loan are financially constrained we follow the approach Banerjee and Duflo (2014) use to

evaluate a directed lending program in India. They argue that if firms are indeed financially constrained they will use any directed credit they receive to increase overall debt. If the firms do not increase debt and simply substitute their existing debt with the directed (and cheaper) credit then this indicates they are not financially constrained. In addition to testing the lending facility's impact on leverage, we evaluate its effects on two real outcomes: capital investment (*CAPX*) and employment (*Employment growth*). Financing constraint studies have long focused on fixed capital investment (e.g., Fazzari, Hubbard, and Petersen, 1988), and there is increasing interest in the impact of financing constraints on labor market outcomes, particularly among policymakers (e.g., Pagano and Pica, 2012).

4.1. Control group construction

The construction of the lending facility makes it possible to proxy for the counterfactual outcome of what would have happened to the loan firms in the absence of obtaining the loan funds. We exploit the fact that the lending facility offered little or no substantive funding for firms with relative low payroll tax payments. We create a control group of firms with low loan capacity and compare them to the treated firms (i.e., loan firms). Table 1 showed just how different loan firms are to all other firms in the economy. In particular, recall that the loan firms invest more (*CAPX*), have higher leverage (*Debt*) and sales growth (*Sales growth*), and they are larger (*Wage bill*), whereas the no loan firms have higher cash flows (*Cash flow*), cash holdings (*Cash*) and dividends (*Dividend*). All of the above mentioned characteristics are endogenous factors that determine whether firms need additional funding and choose to use the lending facility. The one plausibly exogenous factor that makes the lending facility relatively more attractive for some firms than for others is loan capacity relative assets (*Loan capacity*). Indeed, just 0.6% of firms in the bottom quartile of *Loan capacity* use the lending facility.

To construct the control group of firms we start by focusing only on the firms in the bottom quartile in *Loan capacity* in the pre-crisis period of 2007-2008 (roughly 35,000 firms). Using this group of firms, we perform exact matching (so called coarsened exact matching, CEM) between the control group and the loan firms based on *Cash flow*, *Debt*, *Firm age*, *Cash*, *Dividend*, *CAPX*, *Sales growth*, and *Wage bill*. Our goal is to create a control group of firms that cannot benefit from the lending facility, but are otherwise similar in all these seven dimensions in the years before the launch of the lending facility.

The first-order objective is to find a control group of firms that do not systematically differ from the loan firms in the matching variables, while sample size is of second-order importance. We start with about 2,500 treated firms and 35,000 (potential) control group firms. After exact matching in the seven dimensions mentioned above we end up with 252 treated firms and 311 control group firms. This is a large reduction in sample size, but we end up with two very similar groups of firms. We compile the descriptive statistics on the *Loan firms* and *Control firms* in Table 5. The treated and control group firms are not statistically different in *Cash flow*, *Debt*, *Firm age*, *CAPX*, *Sales growth*, and *Wage bill*. Even after matching, though, we still cannot reject differences in *Cash* and *Dividend*, though the magnitudes of these differences are small. However, the treated and control group firms have similar internal financial resources (*Cash flow*), leverage (*Debt*) and investment intensity (*CAPX*), as well as being of equal age (*Firm age*) and size (*Wage bill*), and they face similar investment opportunities (*Sales growth*). Despite the careful matching, the control group firms still have 0.8 percentage points higher *Cash* and 0.2 percentage points higher *Dividend*. Although we have not eliminated the differences in these two variables in the matching approach, we have substantially narrowed the differences for the full sample of firms in Table 1. For example, the no loan firms in the full sample have 20 percentage points higher *Cash* and almost 3-percentage points higher *Dividend*. The two sets of firms differ (by

construction) substantially in terms of *Loan capacity*. The treated firms have *Loan capacity* of 0.064 compared to only 0.010 for the control group of firms.

In Figure 3 we examine graphically whether there is a difference in trends in the outcome variables *Debt*, *CAPX*, and *Employment* for the treated and control group firms leading up to the inception of the lending facility in 2009. We plot average *Debt* levels for the two groups of firms in Figure 3a. We focus on the solid line, which reflects the *difference* between the loan firms and matched sample in each year from 2007 to 2010. Notably, not only do the loan firms and the matched control firms have similar levels of *Debt* in 2007 and 2008, but the difference in *Debt* across the two groups is very stable. However, with the introduction of the lending facility in 2009, *Debt* levels for the treated (loan) and matched samples diverge sharply. While the differences in *Debt* across the two samples are not statistically different in 2007 and 2008, the loan firms have statistically significantly higher *Debt* in 2009 and 2010. To the extent that the match sample illustrates the counterfactual outcome, the evidence in Figure 3a suggests that access to the lending facility allowed loan firms to increase debt levels faster than they would have.

We carry out the same exercise in Figures 3b-3c for *CAPX* and *Employment*, respectively. There is no apparent pre-trend in the differences across groups in either *CAPX* or *Employment* leading up 2009, but the difference in favor of loan firms increases in 2009 and 2010, generally consistent with the evidence for *Debt*. The evidence in Figure 3 suggests similar trends for the loan and no loan samples prior to the introduction of the lending facility, but a sharp change in trend when loan firms accessed the funding provided by the lending program. We study these changes more formally below.

4.2. Regression specification

To quantify the effects of the lending facility on firm financing and subsequent real outcomes, we use the following difference-in-difference specification:

$$Outcome_{i,t} = \beta_0 + \beta_1 LP_t + \beta_2 LF_i + \beta_3 (LP_t \times LF_i) + \beta_4 X_{i,t} + \varepsilon_{i,t} \ . \quad (1)$$

In equation (1), $Outcome_{i,t}$ is either the annual change in *Debt* (*Debt growth*), annual rate of capital investment (*CAPX*), or annual change in log employment (*Employment growth*). The β_0 coefficient captures the intercept term. The term LP_t is an indicator variable taking on the value one during the loan period (2009-2010), and zero in the years before. LF_i is an indicator variable taking on the value one if the firm accessed the lending facility. The interaction term, $LP_t \times LF_i$, captures the interaction between loan firms and loan period years. Consequently, β_3 captures the differential effect of the lending facility on loan firms in the crisis period and represents the treatment effect. $\boldsymbol{X}$ is a vector of control variables. We report results using alternative sets of control variables and fixed effects, including the lagged value of the outcome variable ($Outcome_{i,t-1}$), *Cash flow*, *Firm age*, *Cash*, *Dividend*, *Wage bill*, and *Sales growth*. Finally, $\varepsilon_{i,t}$ is an error term which we cluster at the firm level.

5. Effects of the lending facility

5.1 Testing for financing constraints: Debt regressions

We start by using the full sample of firms and estimating equation (1) with *Debt growth* as the dependent variable. We report these full sample results in the first four columns of Table 6. We begin in the first column by estimating specification (1) without control variables but with industry fixed effects. The interaction effect (*LP* × *LF*) is positive and shows that *Loan firms* increased debt by an additional 2.6 percentage points relative to other firms during the loan period. Further, the large, positive point estimate on the *LF* coefficient

indicates that the loan firms had 1.1-percentage points faster debt growth throughout the entire sample period compared to other firms in the economy. Finally, the coefficient on the *Loan period* dummy variable is -0.030, indicating that debt growth falls, on average, by 3 percent during the loan period, as expected since this coincides with the aftermath of the financial crisis.

In column (2) of Table 6 we add the vector of control variables and reach similar conclusions. Specifically, controlling for firm-specific characteristics leaves the interaction effect unchanged and inflates the *LF* coefficient (from 1.1 to 2.8-percentage points), further highlighting the fact that *Loan firms* have faster debt growth throughout the 2007-2010 sample period. In column (3) we re-estimate specification (1) with a firm fixed effects estimator and find very similar results. In column (4) we include both firm fixed effects and year dummies (which causes both the loan firm and loan period indicators to fall out of the regression) and again find a main interaction effect (*LP* × *LF*) of around 0.026. Thus, relative to all firms in the economy, firms using the lending facility clearly experience differentially faster debt growth during the years they access the lending facility.

In the next two columns we begin to exploit the variation in *Loan capacity* introduced by the design of the lending facility. We have shown that a very small fraction of firms with low *ex ante Loan capacity* make use of the lending facility (e.g., Figure 1b). In column (5) we estimate specification (1) using only firms in the bottom quartile in *Loan capacity*. Not surprisingly, the interaction effect (*LP* × *LF*) is close to zero and far from statistically significant, showing that use of the lending facility had little differential impact on debt growth among firms with little or no *Loan capacity*. On the other hand, when we focus only on firms in the top quartile of *Loan capacity* in column (6), we find a positive, significant, and economically substantial coefficient on the *LP* × *LF* interaction term. These results are

reassuring, as they show that actual differential debt growth is higher among the firms with greater *potential* to benefit from the lending program.[7]

We use the matched sample in columns (7)-(8). The control group consists of 311 low *Loan capacity* (bottom quartile in *Loan capacity* in 2007-2008) firms who are statistically indistinguishable from the 252 treated (loan) firms in *Cash flow*, *Debt*, *Firm age*, *Sales growth*, *Wage bill* and *CAPX* in the two years leading up to the lending facility (see Table 5). Moreover, we show in Figure 3a that the evolution of *Debt* levels prior to the introduction of the lending facility is similar for the treated and control groups, thus avoiding the key concern that debt growth is always faster for loan firms. The sample here consists of two observations per firm. The observation prior to the lending facility is the average over 2007-2008, and the second observation is the post value measured as the average over 2009-2010. We estimate specification (1) both with and without a firm specific indicator (*LF*). Regardless, the estimated treatment effect is very similar: 0.063 in column (7) and 0.060 in column (8). In other words, Debt increases by around six percentage points for treated firms relative to the counterfactual outcome derived from a sample of otherwise similar firms with inherently lower access to the lending facility (as measured by *Loan capacity*). This suggests that when we more carefully design a counterfactual outcome to the loan firms we obtain a considerably larger effect from the lending facility.

Together, the findings in Table 6 show that firms used the lending facility to increase debt levels, not merely to substitute the funds to pay down other debts. These results suggest that the loan firms face binding financing constraints, and access to the lending facility at least partially mitigated those constraints. We next check how access to the loan funds impacted real activity.

[7] In unreported regressions we estimate specification (1) for the firms in the second and third quartiles and also find positive differential effects from the lending facility, consistent with the estimates in the first four columns.

5.2 Real effects: Investment and employment regressions

In the first three columns of Table 7 we estimate specification (1) with *CAPX* as the dependent variable. Using the full sample of firms (column (1)), we find a positive and significant coefficient on the key interaction term (*LP* × *LF*), indicating that loan firms invested relatively more during the loan period than other firms in the economy. But both the loan firm (*LF*) and the loan period (*LP*) indicators are also positive and significant, suggesting that loan firms always invest more than other firms (as in the overall descriptive statistics in Table 1). Thus, in columns (2) and (3) we use the smaller matched sample. Consistent with the findings for *Debt growth* in Table 6, we find a positive and significant coefficient on the key interaction term (*LP* × *LF*) using the more carefully designed matched sample. Notably, the individual loan firm and loan period coefficients in columns (2) and (3) are both close to zero and far from statistically significant. The results suggest that access to the lending facility facilitated firm investment in real assets (relative to the counterfactual).

We evaluate whether the lending facility affected firm level employment in the remaining three columns in Table 7. We estimate specification (1) with *Employment growth* as the dependent variable. The results using *Employment growth* as the real outcome are more mixed. In column (1) we use the full sample of firms and retrieve a positive coefficient on the interaction term (*LP* × *LF*), but it is not statistically different from zero. Loan firms display higher *Employment growth* than other firms throughout the sample period, as captured by the positive and significant point estimate of *LF*. In columns (5) and (6) we focus on the matched sample and while in each case we find a positive coefficient on the interaction term (*LP* × *LF*), it is only statistically significant in column (5) when we exclude the loan firm indicator (*LF*). The weaker real effects for employment are not completely surprising. First, employment is a slower moving variable than investment and might not respond quickly enough for us to capture the impact from the lending facility on employment decisions.

Second, our sample is dominated by very small firms, the vast majority of which have zero employment growth throughout the sample period. Third, the employment outcome might be more sensitive to the actual size of loans accessed and therefore we do not fully capture the importance of the lending facility using the binary approach as we do here. We address points two and three for all outcome variables in the next section.

6. Additional tests

6.1 Sensitivity to loan proceeds

Thus far we have compared firms that accessed the lending facility to firms that did not. We now turn to tests of whether the amount of funding provided by the lending facility mattered for debt growth and real activity *within* the subset of *Loan firms*. Specifically, we restrict the analysis to the 2,500 firms that took the loan and measure the sensitivity of outcomes to actual loan proceeds. We measure loan proceeds as the amount of loan funds accessed normalized by total assets (*Loan amount*). We track the loan firms over the full four year period and consider a similar specification to specification (1), with the exception that the interaction term ($LP \times LF$) is replaced by *Loan amount* and the loan firm indicator, *LF*, is dropped since we only analyze loan firms. The results are compiled in Table 8. We use *Debt growth* as the dependent variable in columns (1) and (2), and *CAPX* and *Employment growth* in columns (3)-(4) and (5)-(6). We use a pooled OLS estimator with industry fixed effects in odd numbered columns, and a firm fixed effects estimator in even numbered columns.

The estimates in Table 8 show that *Debt growth*, *CAPX*, and *Employment growth* all share a positive and significant relation with the amount of funding provided by the lending facility. The positive relation between the *Loan amount* and the outcome variables is robust to different control sets and different fixed effects structures. These results support the financing constraint interpretation we advanced earlier: not only do *Loan firms* borrow and

invest more than other firms, but the extent to which *Loan firms* borrow and invest is a function of the lending they obtained from the loan program.

6.2 Firm size distribution

As a final test we address the fact that a large fraction of our sample consists of firms that are very small. We know from Figures 1a-1b that the lower quartiles of firms in terms of number of workers account for very few of the loan firms (less than 200). We thus re-evaluate our main results focusing only on firms in the top quartile of the firm size distribution (that is, firms with at least seven employees). The results are reported in Table 9. In odd numbered columns we estimate specification (1) using *Debt growth*, *CAPX* and *Employment growth* as dependent variables, while in even numbered columns we evaluate the sensitivity of *Debt growth*, *CAPX* and *Employment growth* to size of loan proceeds using only the sample of loan firms.

In column (1) we evaluate the impact of taking the loan on *Debt growth*. The sample is about one fourth as large compared to the corresponding sample in Table 6. However, the interaction term ($LP \times LF$) is very similar to the result for the full sample in Table 6. We also document a positive point estimate of *LF* and a negative (albeit smaller in size relative to the full sample) on *LP*. In column (2), where we evaluate the sensitivity of debt to loan proceeds among only the loan firms, we again find a positive and significant relation between the amount of funding the loan firms receive and debt growth, very similar to the findings for the full sample in Table 8. We repeat the same exercise using *CAPX* as dependent variable in columns (3) and (4) and find very similar results. We therefore conclude that the previously strong results for *Debt* and *CAPX* are not sensitive to dropping the large fraction of very small firms used in the full sample.

In the final two columns we evaluate how the results using *Employment growth* are affected by the exclusion of the large quantity of very small firms. As noted above, we suspect that the weaker results for employment growth in Table 7 might be due to the large quantity of very small firms. Indeed, we do find considerably more precise and robust estimates for *Employment growth* when we restrict the sample to (relatively) large firms. We retrieve a positive and highly statistically significant interaction effect ($LP \times LF$) in column (5): the point estimate is 0.040 and it is significant at below the one percent level. This result should be compared to non-significant point estimate of 0.009 in column (4) in Table 7 where we estimate the same specification but on the full sample of firms. Finally, we estimate the sensitivity of employment to loan proceeds in column (6) and find larger and more precisely estimated results than with the full sample in columns (5)-(6) in Table 9.

We show here that the effects of the lending facility we documented earlier are, if anything, even stronger when we exclude the large number of very small firms in our sample. In particular, results using *Employment growth* as the real outcome variable are much stronger in the reduced sample than in the initial results reported in Table 7.

7. Conclusion

We study a novel government policy, launched in Sweden in early 2009, to evaluate the consequences of financing constraints in a crisis. The policy gave firms the opportunity to postpone paying labor taxes and instead treat any unpaid taxes as a loan on the balance sheet. The purpose of the lending facility was to offer firms a temporary liquidity boost by enabling them to postpone paying two months' worth of labor related taxes for up to one year. We show that i) the firms that took the loan appear to be more financially constrained than other firms, ii) the lending program mitigated these constraints, and iii) the funds raised by the loan facility were used for real activity such as capital investment and employment growth. Our

study presents new evidence on the effects of financing constraints in a crisis, as well as evidence on the consequences of policies aimed to alleviating the effects of temporary and severe adverse shocks in financial markets.

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Table 1. Summary statistics.

Average values across firm variables. *, **, and *** indicate statistical significance levels of 10, 5 and 1% of the difference in means across loan firm and other firms.

	All firms 2007-2010		All firms 2007-2008		All firms 2009-2010	
	Loan firm	Other	Loan firm	Other	Loan firm	Other
Debt growth	0,025***	0,005	0,038***	0,020	0,014***	-0,010
CAPX	0,058***	0,043	0,060***	0,045	0,056***	0,041
Employment growth	0,056***	0,020	0,118***	0,030	-0,009	0,008***
Cash flow	0,063	0,121***	0,084	0,132***	0,039	0,109***
Debt	0,599***	0,407	0,581***	0,415	0,619***	0,399
Firm age	2,593	2,605	2,492	2,511	2,707	2,703
Cash	0,097	0,294***	0,115	0,293***	0,077	0,294***
Dividend	0,016	0,043***	0,018	0,044***	0,014	0,042***
Sales growth	0,045***	-0,041	0,113***	-0,012	-0,028***	-0,070
Wage bill	15,118***	13,595	15,081***	13,613	15,145	13,596
Loan capacity	0,086***	0,060	0,091***	0,062	0,080***	0,058
Interest cost	0,049***	0,037	0,049***	0,039	0,049***	0,035
Loan amount	0,069***	0,000	0,000	0,000	0,069***	0,000

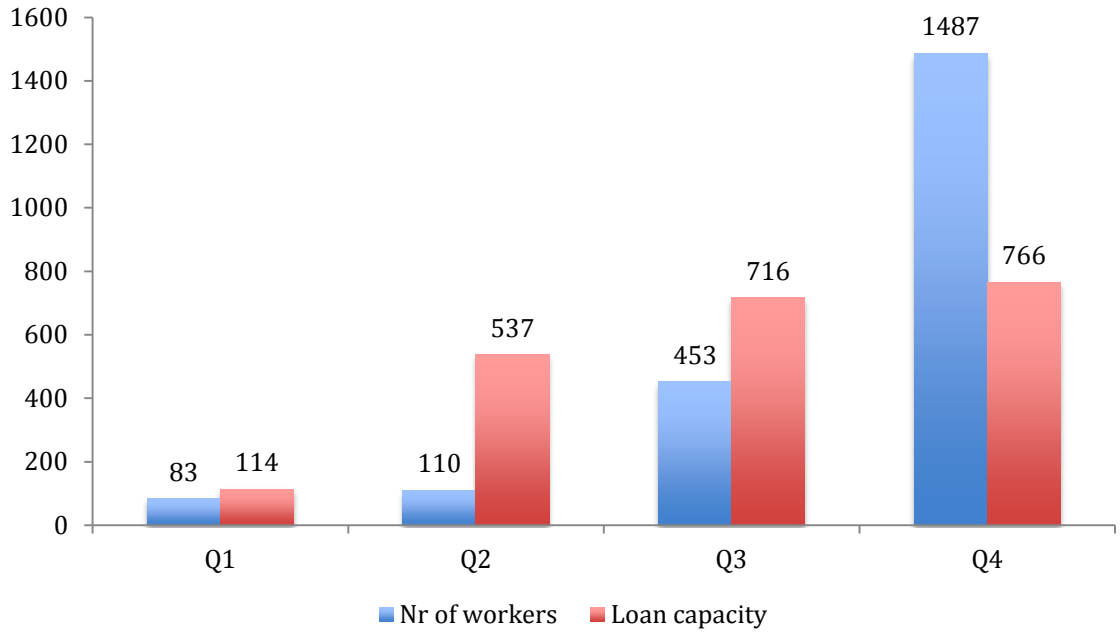

Figure 1a. Nr of loan firms across quartiles

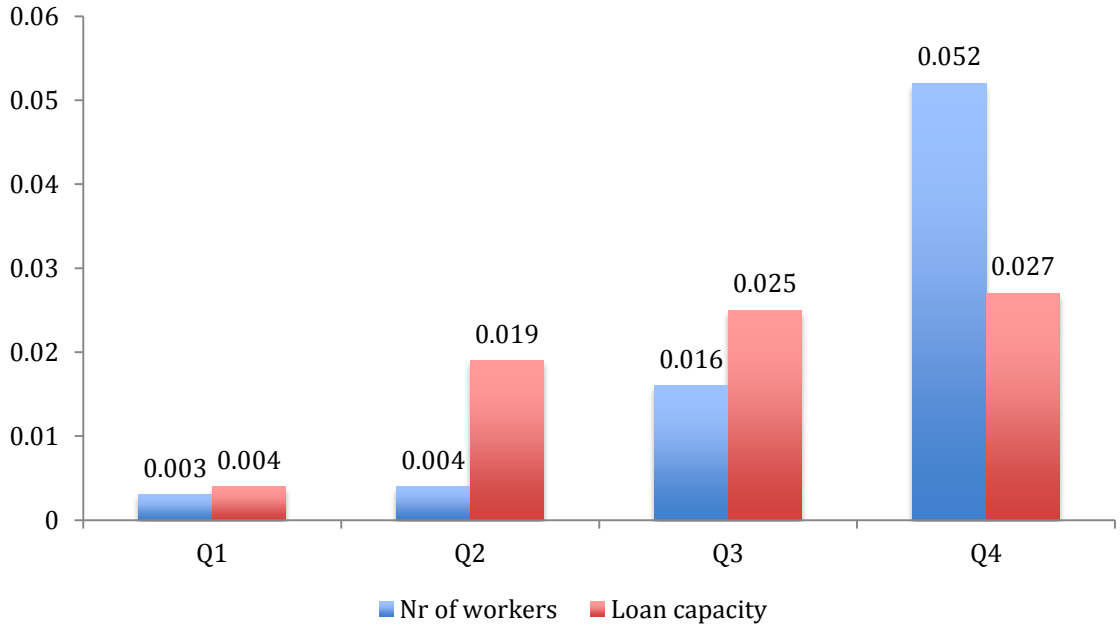

Figure 1b. Fraction of loan firms across quartiles

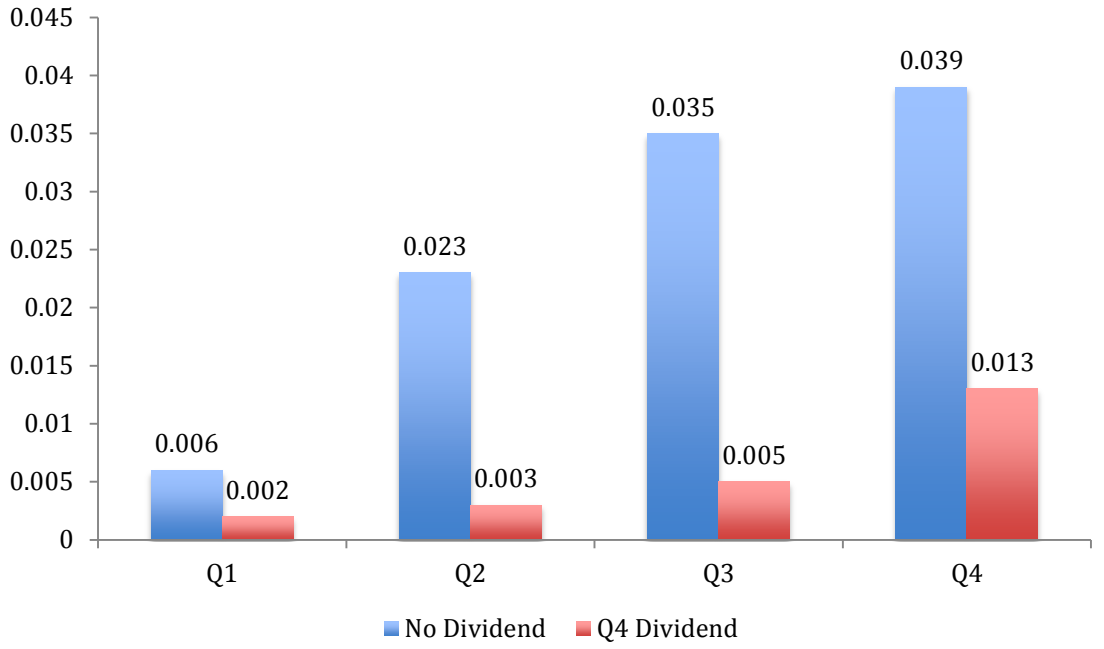

Figure 2a. Fraction of loan firms across Loan capacity quartiles divided into high and no dividend paying firms.

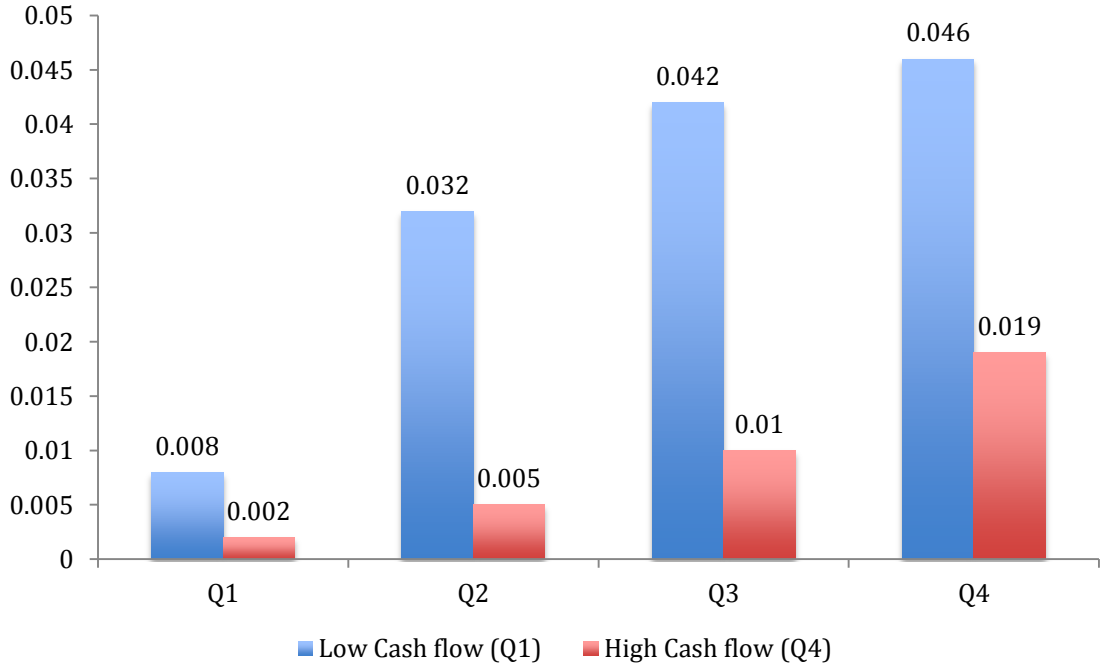

Figure 2b. Fraction of loan firms across Loan capacity quartiles divided into high and low Cash flow firms.

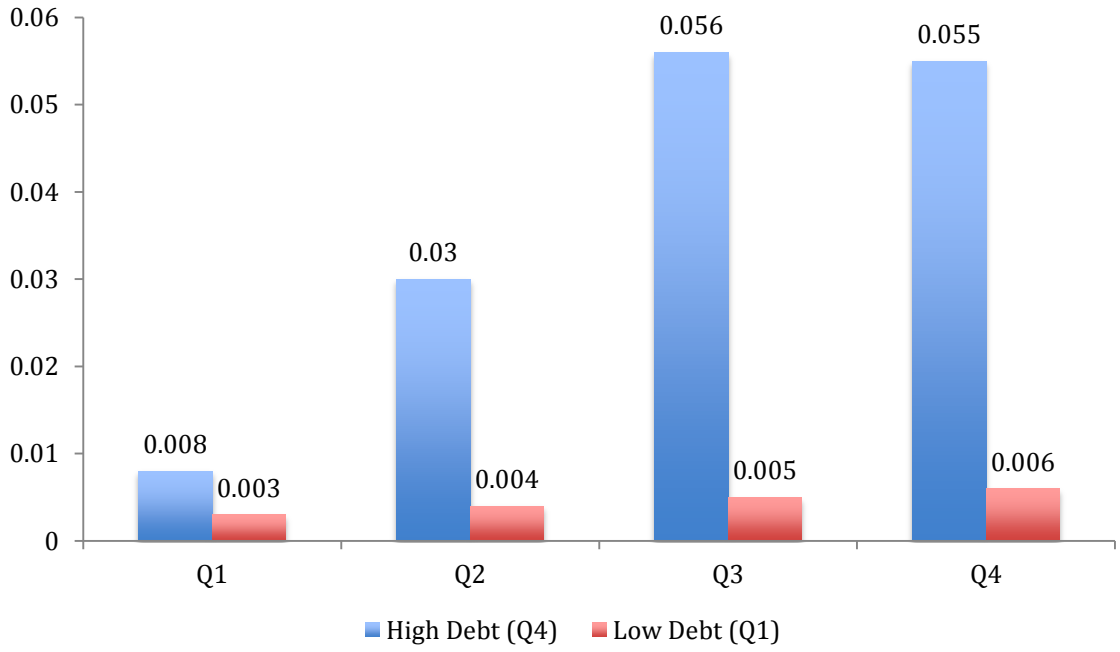

Figure 2c. Fraction of loan firms across Loan capacity quartiles divided into low and high Debt firms.

Table 2. Logit regression models.

The dependent variable takes on the value 1 for loan firms and zero otherwise. The data is 2008 year data. Standard errors (in parenthesis) are clustered at the firm level. *, **, and *** denote statistical significance at 10, 5, 1% respectively.

	(1)	**(2)**	**(3)**	**(4)**
Cash flow	-1,117	-1,542	-1,849	-2,252
	(0,177)***	(0,258)***	(0,434)***	(0,735)***
Debt	2,147	2,307	2,538	2,143
	(0,108)***	(0,150)***	(0,230)***	(0,346)***
Firm age	-0,239	-0,153	-0,065	0,044
	(0,028)***	(0,036)***	(0,057)	(0,092)
Cash	-3,475	-3,758	-3,038	-4,477
	(0,268)***	(0,402)***	(0,637)***	(1,195)***
Dividend	-4,577	-4,744	-2,526	-1,635
	(0,768)***	(1,049)***	(1,134)**	(1,477)
Wage bill	0,612	0,404	0,267	0,239
	(0,015)***	(0,030)***	(0,060)***	(0,167)
Sales growth	0,357	0,494	0,491	0,568
	(0,061)***	(0,084)***	(0,723)***	(0,210)***
Loan capacity	3,504	3,250	2,763	2,586
	(0,281)***	(0,390)***	(0,639)***	(1,128)**
Interest costs	3,023	3,846	4,091	3,116
	(0,266)****	(0,409)***	(0,723)***	(1,238)**
Industry fixed effects	Yes	Yes	Yes	Yes
Sample restriction	None	7 or more employees (Q4 in size distribution)	20 or more employees	50 or more employees
Observations	127324	31621	9832	3260
Fraction of firms taking loan	0,018	0,054	0,075	0,082

Table 3. Loan amount summary statistics

				Loan amount				Used loan amount (loans/loan capacity)			
	Nr of firms	**Total loan capacity (MSEK)**	**Total (MSEK)**	**Mean**	**25th**	**Median**	**75th**	**Mean**	**25th**	**Median**	**75th**
	Panel A: Aggregate statistics										
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**	**(11)**
2009	2,133	5950	4460	2062049	96329	228133	578245	0,609	0,416	0,658	0,770
2010	888	3390	417	447283	54139	140000	333965	0,504	0,323	0,448	0,708
	Panel B: Divided into firm size cohorts										
Q1	83	9	6	78470	21604	42226	83906	0,606	0,392	0,660	0,809
Q2	110	10,1	9	81762	32210	49667	79846	0,636	0,471	0,654	0,773
Q3	453	70,7	55	121574	56565	90453	136335	0,608	0,415	0,623	0,775
Q4	1,487	5860	4390	2951066	198331	382229	808161	0,607	0,411	0,665	0,768

Table 4. *Loan amount* distributed across *Loan capacity* quartiles.

Loan capacity quartiles:	All	Q1	Q2	Q3	Q4
	Loan amount				
	(1)	**(2)**	**(3)**	**(4)**	**(5)**
Mean	0,069	0,026	0,036	0,063	0,170
25th	0,020	0,009	0,023	0,039	0,076
Median	0,038	0,016	0,034	0,059	0,109
75th	0,073	0,023	0,043	0,076	0,154

Table 5. Summary statistics for the matched sample

This table present firm averages for 2007-2008 for a set of loan firms (treated) and control group firms. The control group is drawn from firms in the bottom quartile in *Loan capacity* during 2007-2008. These firms are then matched using exact matching for *Cash flow*, *Debt*, *Firm age*, *Cash*, *Dividend*, *Sales growth*, *Wage bill*, and *CAPX*. *, **, and *** denote statistical significance at 10, 5, 1% respectively.

	Loan firm	Control firms	Diff	p-value
Cash flow	0,037	0,041	-0,003	0,405
Debt	0,592	0,592	0,000	0,995
Firm age	2,964	2,949	0,014	0,789
Cash	0,028	0,036	-0,008	0,018**
Dividend	0,003	0,005	-0,002	0,005***
Sales growth	-0,001	-0,005	0,004	0,729
Wage bill	14,891	14,792	0,099	0,388
CAPX	0,024	0,022	0,002	0,308
Nr of firms	252	311	-	-

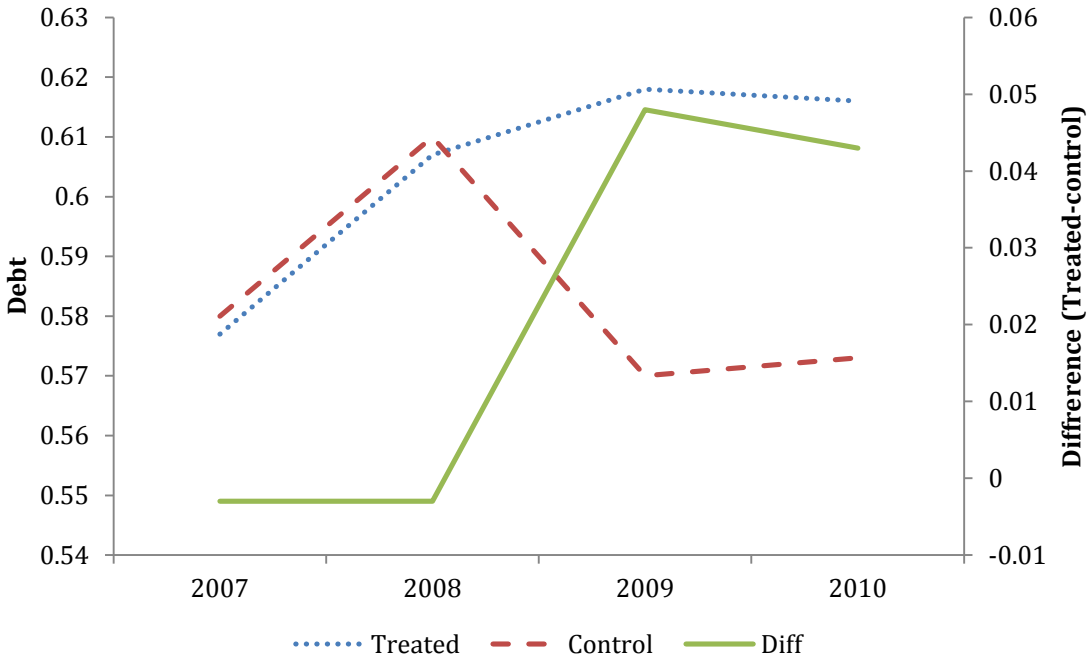

Figure 3a. *Debt* during 2007-2010

Development of *Debt* for the treated (dotted line) and control group (dashed line) firms during 2007-2010. The annual difference between treated and control group firms is displayed by the full line. The control group is drawn from firms in the bottom quartile in *Loan capacity* during 2007-2008. These firms are then matched using exact matching for *Cash flow, Debt, Firm age, Cash, Dividend, Sales growth, Wage bill,* and *CAPX*. There are 252 treated firms and 311 control group firms.

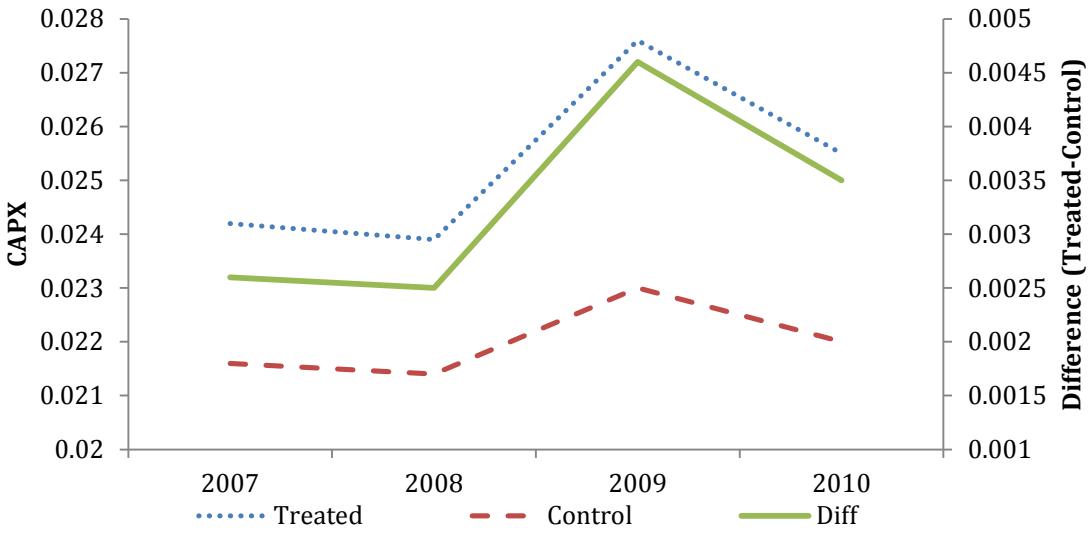

Figure 3b. *CAPX* during 2007-2010

Development of *CAPX* for the treated (dotted line) and control group (dashed line) firms during 2007-2010. The annual difference between treated and control group firms is displayed by the full line. The control group is drawn from firms in the bottom quartile in *Loan capacity* during 2007-2008. These firms are then matched using exact matching for *Cash flow, Debt, Firm age, Cash, Dividend, Sales growth, Wage bill,* and *CAPX*. There are 252 treated firms and 311 control group firms.

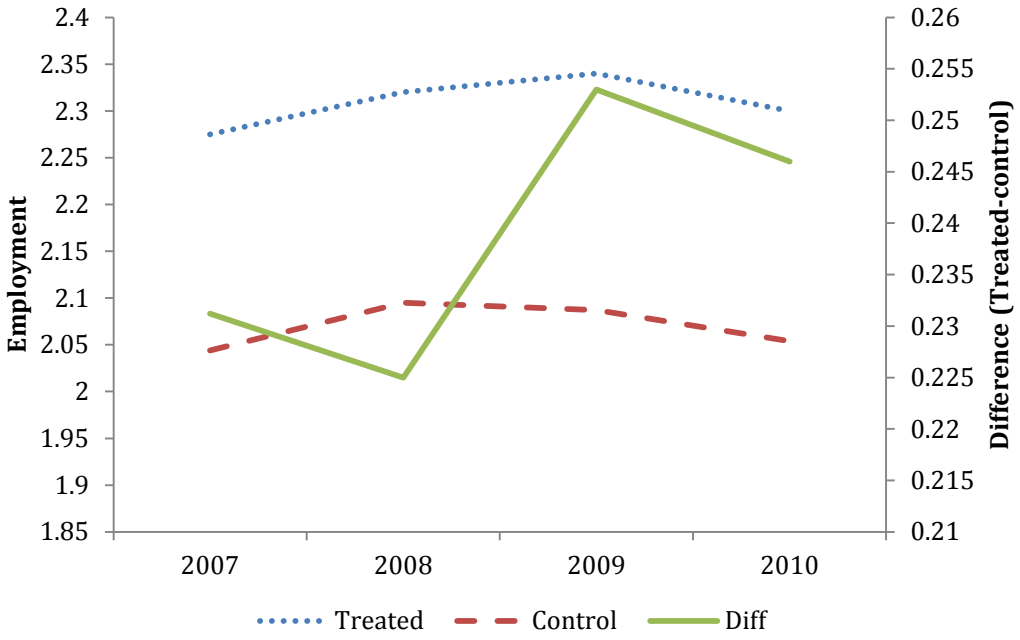

Figure 3c. *Employment* during 2007-2010

Development of *Employment* for the treated (dotted line) and control group (dashed line) firms during 2007-2010. The annual difference between treated and control group firms is displayed by the full line. The control group is drawn from firms in the bottom quartile in *Loan capacity* during 2007-2008. These firms are then matched using exact matching for *Cash flow*, *Debt*, *Firm age*, *Cash*, *Dividend*, *Sales growth*, *Wage bill*, and *CAPX*. There are 252 treated firms and 311 control group firms.

Table 6. Regression analysis: Debt growth

Table 6 reports OLS regressions with the annual change *Debt* (*Debt growth*) as dependent variable. *LP* is an indicator variable taking on the value one in the years of the lending facility (2009 and 2010) and zero otherwise. *LF* is an indicator variable taking on the value one if it is a loan firm and zero otherwise. Standard errors clustered at the firm level are in parenthesis. ***, **, and * stand for significance levels at 1%, 5%, and 10% respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Sample	**Full sample**				**Loan capacity Quartile 1**	**Loan capacity Quartile 4**	**Matched sample**	
Loan firm × Loan period	0,026	0,026	0,024	0,026	0,010	0,028	0,063	0,060
	(0,004)***	(0,003)***	(0,004)***	(0,004)***	(0,009)	(0,006)***	(0,022)***	(0,021)***
Loan firm (LF_i)	0,011	0,028	-	-	0,024	0,027	-	0,004
	(0,002)***	(0,002)***			(0,004)***	(0,004)***		(0,016)
Loan period (LP_t)	-0,030	-0,023	-0,026	-	-0,035	-0,008	0,002	0,003
	(0,000)***	(0,000)***	(0,001)***		(0,001)***	(0,001)***	(0,009)	(0,010)
l.Debt	-	-0,211	-	-	-0,185	-0,352	-	-
		(0,001)***			(0,005)***	(0,003)***		
Cash flow	-	-0,182	-0,284	-0,287	-0,156	-0,223	-0,202	-0,202
		(0,002)***	(0,003)***	(0,003)***	(0,005)***	(0,004)***	(0,102)*	(0,103)*
Firm age	-	-0,010	-0,035	-0,017	-0,009	-0,006	-0,042	-0,042
		(0,000)***	(0,002)***	(0,002)***	(0,001)***	(0,001)***	(0,012)***	(0,012)***
Cash	-	-0,005	0,114	0,116	-0,015	0,010	-0,356	-0,355
		(0,001)***	(0,002)***	(0,002)***	(0,002)***	(0,002)***	(0,124)***	(0,124)***
Dividend	-	-0,012	0,083	0,079	-0,004	-0,019	-1,681	-1,675
		(0,003)***	(0,006)***	(0,006)***	(0,008)	(0,006)***	(0,315)***	(0,316)***
Sales growth	-	0,043	0,026	0,025	0,034	0,063	0,092	0,091
		(0,001)***	(0,001)***	(0,001)***	(0,001)***	(0,002)***	(0,030)***	(0,030)***
Wage bill	-	0,000	0,012	0,012	-0,002	0,008	-0,028	-0,028
		(0,001)	(0,001)***	(0,001)***	(0,000)***	(0,000)***	(0,006)***	(0,006)***
Industry fixed effects	Yes	Yes	No	No	Yes	Yes	Yes	Yes
Firm fixed effects	No	No	Yes	Yes	No	No	No	No
Year fixed effects	No	No	No	Yes	No	No	No	No
Observations	551950	495760	495760	495760	94925	98397	1071	1071
Adjusted R-squared	0,010	0,163	0,042	0,050	0,132	0,271	0,242	0,242

Table 7. Regression analysis: Investment and employment regressions

Table 7 reports OLS regressions with *CAPX* (columns (1)-(3)) and *Employment growth* (columns (4)-(6)) as dependent variables. *LP* is an indicator variable taking on the value one in the years of the lending facility (2009 and 2010) and zero otherwise. *LF* is an indicator variable taking on the value one if it is a loan firm and zero otherwise. Standard errors clustered at the firm level are in parenthesis. ***, **, and * stand for significance levels at 1%, 5%, and 10% respectively.

	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Dependent variable	***CAPX***			***Changes in Employment***		
Sample	Full	Matched		Full	Matched	
Loan firm × Loan period	0,003	0,010	0,010	0,009	0,188	0,074
	(0,001)***	(0,003)***	(0,003)***	(0,010)	(0,076)**	(0,069)
Loan firm (LF_i)	0,002	-	0,000	0,046	-	0,105
	(0,001)***		(0,002)	(0,005)***		(0,057)*
Loan period (LP_t)	0,002	0,001	0,001	-0,012	-0,099	-0,066
	(0,000)***	(0,001)	(0,001)	(0,001)***	(0,035)***	(0,034)*
l.CAPX	0,619	-	-	-	-	-
	(0,002)***					
l.log(employment)	-	-	-	-0,293	-	-
				(0,003)***		
Cash flow	0,047	0,082	0,082	-0,008	-0,199	-0,209
	(0,001)***	(0,024)***	(0,024)***	(0,005)*	(0,338)	(0,399)
Firm age	-0,001	-0,009	-0,009	0,001	0,297	0,298
	(0,000)***	(0,002)***	(0,002)***	(0,001)	(0,063)***	(0,063)***
Cash	-0,016	-0,027	-0,027	-0,040	0,000	0,033
	(0,000)***	(0,010)***	(0,011)***	(0,002)***	(0,361)	(0,363)
Dividend	-0,040	-0,051	-0,051	-0,072	5,461	5,606
	(0,001)***	(0,060)	(0,062)	(0,009)***	(2,546)**	(2,558)**
Sales growth	0,007	0,005	0,005	0,103	-0,074	-0,083
	(0,000)***	(0,003)	(0,003)	(0,003)***	(0,142)	(0,143)
Wage bill	-0,001	0,002	0,002	0,247	0,914	0,916
	(0,000)***	(0,001)**	(0,001)**	(0,002)***	(0,031)***	(0,031)***
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	482840	1071	1071	421938	1059	1059
Adjusted R-squared	0,613	0,263	0,262	0,248	0,843	0,844

Table 8. Regression analysis: Sensitivity of outcomes to loan proceeds

Table 8 reports OLS regressions with *Debt growth* (columns (1)-(2)), *CAPX* (columns (3)-(4)) and *Employment growth* (columns (5)-(6)) as dependent variables. *LP* is an indicator variable taking on the value one in the years of the lending facility (2009 and 2010) and zero otherwise. *LF* is an indicator variable taking on the value one if it is a loan firm and zero otherwise. Standard errors clustered at the firm level are in parenthesis. ***, **, and * stand for significance levels at 1%, 5%, and 10% respectively.

	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
	Debt growth		***CAPX***		***Employment growth***	
Loan amount	0,084	0,098	0,019	0,019	0,661	0,953
	(0,024)***	(0,019)***	(0,005)***	(0,006)***	(0,327)**	(0,468)**
Loan period (LP_t)	-0,006	-0,025	0,004	0,000	-0,052	-0,126
	(0,003)**	(0,004)***	(0,001)***	(0,001)	(0,013)***	(0,021)***
l.Debt	-0,321	-	-	-	-	-
	(0,011)***					
l.CAPX	-	-	0,513	-	-	-
			(0,017)***			
l.log(employment)	-	-	-	-	-0,417	-
					(0,027)***	
Cash flow	-0,148	-0,263	0,050	0,040	-0,037	-0,128
	(0,014)***	(0,021)***	(0,005)***	(0,005)***	(0,033)	(0,059)*
Firm age	-0,009	-0,016	-0,003	0,007	0,015	0,063
	(0,002)***	(0,016)	(0,001)***	(0,003)**	(0,006)**	(0,052)
Cash	-0,058	0,017	0,005	0,016	-0,024	0,094
	(0,017)***	(0,025)	(0,005)	(0,006)***	(0,034)	(0,058)
Dividend	0,017	0,181	-0,056	0,015	0,074	0,332
	(0,041)	(0,073)**	(0,014)***	(0,016)	(0,113)	(0,195)*
Sales growth	0,023	0,017	0,016	0,014	0,200	0,265
	(0,005)***	(0,007)***	(0,002)***	(0,002)***	(0,024)***	(0,030)***
Wage bill	-0,005	0,019	-0,001	0,002	0,403	0,442
	(0,001)***	(0,007)***	(0,000)***	(0,001)	(0,023)***	(0,038)***
Industry fixed effects	Yes	No	Yes	No	Yes	No
Firm fixed effects	No	Yes	No	Yes	No	Yes
Observations	9715	9715	9390	9390	9306	9306
Adjusted R-squared	0,194	0,035	0,501	0,038	0,426	0,046

Table 9. Regression analysis: only top quartile of firms in terms of employees

Table 9 reports OLS regressions with *Debt growth* (columns (1)-(2)), *CAPX* (columns (3)-(4)) and *Employment growth* (columns (5)-(6)) as dependent variables. *LP* is an indicator variable taking on the value one in the years of the lending facility (2009 and 2010) and zero otherwise. *LF* is an indicator variable taking on the value one if it is a loan firm and zero otherwise. Standard errors clustered at the firm level are in parenthesis. ***, **, and * stand for significance levels at 1%, 5%, and 10% respectively.

	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
	Debt		***CAPX***		***Employment growth***	
Loan firm × Loan period	0,021	-	0,004	-	0,040	-
	(0,004)***		(0,001)***		(0,010)***	
Loan amount	-	0,071	-	0,015	-	1,133
		(0,012)***		(0,003)***		(0,350)***
Loan firm (LF_i)	0,026	-	0,004	-	0,019	-
	(0,002)***		(0,001)***		(0,006)***	
Loan period (LP_t)	-0,009	-0,003	0,003	0,005	-0,003	-0,056
	(0,001)***	(0,003)	(0,000)***	(0,001)***	(0,002)*	(0,014)***
l.Debt	-0,194	-0,287				
	(0,002)***	(0,013)***				
l.CAPX	-	-	0,586	0,490	-	-
			(0,005)***	(0,021)***		
l.log(employment)	-	-	-	-	-0,309	-0,350
					(0,008)***	(0,033)***
Cash flow	-0,163	-0,140	0,064	0,055	0,042	-0,036
	(0,004)***	(0,019)***	(0,002)***	(0,007)***	(0,011)***	(0,044)
Firm age	-0,008	-0,013	-0,001	-0,003	-0,003	0,015
	(0,001)***	(0,003)***	(0,000)***	(0,001)***	(0,002)*	(0,007)**
Cash	-0,028	-0,077	-0,010	0,014	0,020	0,055
	(0,002)***	(0,026)***	(0,001)***	(0,009)	(0,006)***	(0,048)
Dividend	0,017	0,107	-0,059	-0,046	-0,104	0,217
	(0,006)***	(0,054)**	(0,002)***	(0,018)**	(0,016)***	(0,152)
Sales growth	0,041	0,007	0,017	0,020	0,277	0,252
	(0,002)***	(0,007)	(0,001)***	(0,003)***	(0,008)***	(0,029)***
Wage bill	-0,008	-0,012	-0,002	-0,003	0,247	0,319
	(0,000)***	(0,002)***	(0,000)***	(0,001)***	(0,007)***	(0,029)***
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	123753	6220	121240	6058	122946	6164
Adjusted R-squared	0,131	0,172	0,630	0,499	0,374	0,438