Access to Liquidity in a Financial Crisis*

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Abstract

At the height of the financial crisis, Sweden allowed firms to suspend payment of labor-related taxes and fees, treating deferred amounts as a loan from the government. We evaluate the effects of the policy, exploiting a feature that caused sharp cross-firm differences in the amount of liquidity it offered. We link the tax deferment policy with higher rates of leverage and real investment spending, and reductions in the marginal revenue product of capital. The policy is also associated with faster sales and employment growth in the post-crisis period. Policy efforts narrowly targeting transitory liquidity needs can have economically important effects.

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1 Introduction

Can policy help mitigate the consequences of negative finance shocks? In the wake of the financial crisis, an important literature emerged on the macro implications of monetary policy and other broad government interventions aimed at alleviating (or avoiding) severe financial market disruptions.[1] There has been much less attention, however, to the effects of micro-level policies targeting firms facing steep but transitory liquidity shortfalls.

This paper studies one such policy, launched in Sweden at the height of the financial crisis. The policy allowed Swedish firms to postpone paying all of the labor-related taxes and fees typically due to the government at the end of each month. These payments are relatively high in Sweden and include withheld personal income taxes, as well as fees to cover employees' social security, government provided health insurance, and workers compensation. For firms choosing to take advantage of this temporary tax deferment, all suspended payments were treated as a loan from the Swedish government, and all such loans were charged a fixed and non-trivial interest rate (approximately 5.3% per year) to discourage firms that were not liquidity constrained from delaying their regularly scheduled tax payments. The program offered liquidity that was very easy to access, available to almost all firms, and only accessible for a short window during the financial crisis. Firms did not have to post collateral, submit paperwork, or go through a formal approval process to gain liquidity from the policy. As such, the Swedish policy differed sharply from more typical government lending programs, which generally take the form of longer-term grants or loan guarantees to particular types of firms.[2]

We study how pre-crisis firm characteristics influence the decision to delay tax payments, and the impact the additional liquidity the program provided had on firm financing and investing activity. We start by studying the link between use of program and firm changes in net debt levels. If firms simply use liquidity from the program as a substitute for other

[1] For example, see Taylor (2009), Claessens, Dell'Ariccia, Igan, and Laeven (2010), French et al. (2010), and Schularick and Taylor (2012).

[2] Many of these programs focus on small- and medium-sized firms, such as the "Compte pour le développement industriel" targeted credit program in France (e.g., Bach (2014)) and the loan guarantees provided by the U.S. Small Business Administration (e.g., Brown and Earle (2017)). See Beck, Klapper, and Mendoza (2010) for a discussion of loan guarantee programs around the world.

sources of short-term debt, then the program did not address a liquidity shortfall and should not have affected the real activity of firms in the crisis. On the other hand, evidence of positive connections between liquidity from the program, changes in net debt levels, and higher rates of real investment spending suggests the policy helped address the liquidity constraints that it targeted.

To evaluate the policy's effects, we focus on a feature that caused sharp differences across firms in the amount of liquidity they could obtain from the tax deferment. Although the option to postpone these payments was available to almost all Swedish limited liability corporations, the amount of liquidity they would gain from doing so differed sharply across firms based on the relative magnitude of their monthly labor tax payments. In this way, some firms were positioned based on *ex ante* firm characteristics to gain relatively more liquidity from the policy. To measure a firm's exposure to the program, we construct a proxy for the maximum amount of liquidity the firm could obtain (relative to the firm's size) using information on firm-level wage bills in the pre-program period (2006-2008). We refer to this value as the firm's "loan capacity". We then focus on whether participating firms with a higher loan capacity are *differentially* responsive to the lending program compared to participating firms with a relatively low loan capacity.

The key assumption underlying this approach is that, although the decision to delay tax payments is clearly endogenous, the *extent of treatment* from the policy (based on *ex ante* loan capacity) is exogenous to firm borrowing and investing decisions. Consistent with this assumption, we find no evidence that the treatment intensity measure relates to debt growth in non-event "placebo" years, including the year prior to the policy's implementation (2008) and the year of the last major economic slowdown in Sweden (2001). Importantly, during these prior time periods there is no relation between loan capacity and debt growth even in the sub-sample of firms who (ultimately) use the option to temporarily suspend their tax payments at the height of the crisis.

In sharp contrast, in the year the program is put in place there is a substantial differential increase in debt ratios among participating firms with a higher loan capacity. Specifically, the average change in debt-to-assets for participating firms in the top quartile of loan capacity

(highest treatment intensity) is approximately 0.07 larger than the corresponding change for participating firms in the bottom quartile. This estimated differential effect across sub-sets of firms sorting into the lending program is substantial, amounting to around 15% of the sample average leverage ratio, and is highly robust across alternative modeling and sampling choices.[3]

We provide several additional tests suggesting the temporary increase in liquidity the policy offered had important effects. To start, we sort firms based on their average borrowing costs in the pre-crisis period. The financial crisis had a particularly strong effect on the supply of risky debt, suggesting riskier firms would have benefited most from the opportunity to gain liquidity at the height of the crisis, when access to (market) lending was most constrained. Consistent with this idea, we find that firms with high borrowing costs were more likely to participate in the program and that the strong differential effect on leverage is driven by the sub-set of firms that enter the crisis with relatively high borrowing costs.

An alternative explanation for these findings is that the policy offered a subsidy relative to the market lending rate for precisely the firms with relatively high (*ex ante*) borrowing costs. We thus also explore how access to liquidity through the policy relates to firm investment spending and the marginal revenue product of capital (e.g., Hsieh and Klenow (2009)). If firms simply used the tax holiday because it was cheaper than using other sources of (traditional) credit, they would primarily use the additional liquidity to substitute for other borrowing rather than to expand real investment (e.g., Banerjee and Duflo (2014)). Notably, although participating firms with relatively low treatment intensity invest *less* and at a *higher* marginal product of capital than non-participating firms – as expected if firms taking advantage of the policy are more credit constrained than other firms – access to liquidity through the policy is associated with a differential increase in real investment spending and a differential reduction in the marginal product of capital moving across treatment intensity quartiles. Together, these findings suggest the ability to temporarily delay tax payments had

[3]The magnitude of this estimate is also plausible given the actual loan capacity of firms in the top treatment intensity quartile. Average loan capacity among firms in the top quartile of treatment intensity is 0.147 (Table 2) and the total estimated change in debt using our preferred specification (column (4) in Table 7) is 0.115.

real effects in participating firms.

Finally, we study the link between the tax deferment and firm growth in the years after the crisis. We find that post-crisis sales and employment growth is significantly faster in firms in the top three quartiles of loan capacity compared to firms in the first quartile. Although it is challenging to conclusively link the policy reform with long-run outcomes, this evidence is at least consistent with the idea that policies providing temporary access to liquidity (during a financial crisis) can have long-lasting economic effects.

Our paper adds to a set of studies on the effects of government policy efforts to alleviate credit constraints in certain types of (typically small) firms. For example, Banerjee and Duflo (2014) show that firms eligible for a targeted lending program in India used the funds to expand production rather than substitute for other borrowing, and Bach (2014) finds that plausibly exogenous extensions to a targeted credit program in France led to substantial increases in the use of (subsidized) debt financing.[4] A key takeaway from these studies is that the government lending programs addressed binding credit constraints among targeted firms. Similarly, Brown and Earle (2017), studying a comprehensive sample of Small Business Administration (SBA) lending in the U.S., link funding from SBA loans with firm-level employment growth. Our paper also highlights a government initiative to address credit constraints, but we study one of the few policies we know of focusing specifically on liquidity provision in a crisis, when credit constraints are likely unusually severe, even among firms not typically credit constrained.

Our study also relates to the large literature on how funding conditions affect firm financing and investing activities, particularly the strand of this literature focusing on the financial crisis.[5] Much of this research focuses on evaluating the impact of credit constraints and identifying the internal adjustments firms make in response to these constraints. Our

[4] Also see Lelarge, Sraer, and Thesmar (2010).

[5] Numerous studies explore how variation in the supply of internal and external finance relates to investment, growth, innovation, financing decisions, and entrepreneurial activity (e.g., Fazzari, Hubbard, and Petersen (1988); Kerr and Nanda (2009); Lemmon and Roberts (2010); Öztekin and Flannery (2012); Brown, Martinsson, and Petersen (2013); Öztekin (2015); Lewellen and Lewellen (2016), Cerqueiro and Penas (2017); Cerqueiro, Hegde, Penas, and Seamans (2017)). Studies focusing specifically on these issues during financial crises include Duchin, Ozbas, and Sensoy (2010), Campello, Graham, and Harvey (2010), Campello, Giambona, Graham, and Harvey (2011), Song and Lee (2012), Berger, Cerqueiro, and Penas (2015), Bliss, Cheng, and Denis (2015), Brown and Petersen (2015), and Floyd, Li, and Skinner (2015).

findings suggest that access to liquidity (via temporary lending or tax deferment programs) during transitory and potentially severe financial market disruptions can have important (and long-lasting) real effects. In this way, our work provides a unique perspective on the effects of access to liquidity in a financial crisis.

2 Institutional detail and implementation of the Swedish policy

2.1 Institutional setting

The severity of the 2008-2009 financial crisis prompted the Swedish government to implement a number of measures aimed at ensuring financial stability (Bergström (2009), Riksbank (2008) and Tillväxtanalys (2013)).[6] Despite these initiatives, the Swedish government was concerned that the financial crisis had spilled over to the real economy, constraining liquidity in otherwise healthy firms.[7] It is evident from Figure 1 that firms perceived financing conditions in Sweden to be unusually difficult in late 2008 and early 2009. In November of 2008 the Swedish National Institute of Economic Research began surveying firms about their ability to access finance. In April of 2009, around the height of the financial crisis, more than 15% of Swedish firms stated that it was "considerably harder than normal" to access finance. The fraction of firms stating it was considerably harder than normal to access finance declines throughout 2009 and 2010, but this fraction does not fall below 10% until the end of 2009 and is above 5% until 2010. After the crisis abates, the fraction of firms stating that it is harder than normal to access finance fluctuates around 5%, roughly suggesting that two to three times as many firms faced financing obstacles in the crisis compared to the normal state of affairs.

[6] For example, the Swedish government doubled the value of deposit insurance (from 250,000 Swedish Krona (SEK) to 500,000 per person and bank equivalent to about 33,000 and 66,000 US dollars) to mitigate the risk of bank runs, and authorities issued multiple guarantees and programs to support financial institutions. Overall, estimates suggest these efforts to stabilize the financial system cost between 25 and 70 billion SEK (3.3 to 9.3 billion US dollars) depending on the time horizon (Tillväxtanalys (2013)).

[7] From Prop. 2008/09:113 *Ökade möjligheter till skatteanstånd.* Translated in to English: Expanded possibilities of tax deferral.

In Figure 2, we show a breakdown of the reasons why Swedish firms perceived that it was harder to access finance in 2009. More than half of all the respondents (53%) emphasized that it was harder than normal to access bank loans. It is against this backdrop that the Swedish government passed the tax deferment policy we study.

2.2 The law of the postponement of labor taxes

On February 25, 2009, the Swedish parliament passed "the law of the postponement of labor taxes". The initial policy was in effect from March 9, 2009 through the end of 2009, and was administered by the Swedish tax agency (Skatteverket). In January 2010 the government extended the program through the end of 2010, noting that although credit conditions had improved, some firms might still confront funding difficulties.[8]

The law allowed firms to postpone paying all labor related taxes and fees, such as employees' income taxes, social security payments, and payroll taxes. The maximum amount a given firm could postpone over the life of the program was capped at twice the monthly amount of total labor fees and taxes.[9] Any delayed payments were treated as a loan from the Swedish government and charged a fixed annual interest rate of 5.3%. The loans had to be paid in full by January 2011. The policy was designed to assist firms facing temporary liquidity shortfalls, not to subsidize firms with ample internal cash flows or bail out firms in financial distress, a point stressed by the Swedish government in the original policy proposal.

The Swedish policy has several interesting properties. First, by targeting a firm's labor taxes, firms did not have to be profitable to gain liquidity from the policy. However, because the funding available through the program is a function of labor-related fees, there is substantial heterogeneity across firms in the extent to which they could gain liquidity from the policy. Second, firms participated in the program by checking a box on the monthly labor tax form, making it straightforward for the firm to access the funds and for the tax agency to administer the program. The estimated cost of administration is 16 million SEK

[8] The initial law is SFS 2009:99 *Lagen om anstånd med inbetalning av skatt i vissa fall.* Translated in to English: The law of tax deferral in certain cases. The extension is Prop. 2009/10:91 *Förlängning av tillfälliga anstånd.* Translated in to English: Extension of the law of tax deferral in certain cases.

[9] The only firms restricted from taking the loan were firms with an outstanding payment default at the debt collector's office. A very small fraction of firms fall into this category (around 0.03% of Swedish firms).

(about 2.1 million US dollars), or just 271 SEK per loan (36 US dollars).[10]

Policymakers purposely set the interest rate so as to not crowd out borrowing (if it was available) from traditional financial institutions. It is difficult to quantify the size of the subsidy the program offered to participating firms, as we do not directly observe the marginal (shadow) cost of debt. It is clear that Swedish firms found it more difficult to access bank loans during the time period the lending program was introduced (e.g., Figure 1 and Figure 2). In addition, although the average interest rate on new loans to non-financial firms falls sharply during the crisis (Figure 3), there is a simultaneous decline in the amount of new credit extended to non-financial firms (Figure 4). It seems plausible that many of the smaller, private firms who could access bank credit in 2008 at relatively high lending rates would have been particularly affected by the credit contraction in 2009, and likely did not have access to new loans at the (low) rates shown in Figure 3.

As a point of comparison, senior unsecured bonds issued by non-financial firms in the United States had an average spread of 8.3 percentage points in March 2009 (Gilchrist, Sim, and Zakrajsek (2012)). Becker and Ivashina (2014) show that small firms switched from bank debt to bonds as bank loan supply contracted in 2008-2009, suggesting that, at least among the firms with some access to debt, the prevailing rate was over 8%. Given that the Swedish banking sector was under similar stress as the US banking sector in 2009 (e.g., the TED spread was around 0.52-0.55 in both the US and Sweden), it is highly likely that private firms in Sweden needing credit faced rates considerably higher than the 5.3% rate charged by the program.

3 Sample construction and descriptive statistics

3.1 Data sources

We start with the Firm Register and Individual Database (FRIDA) and financial reporting data from the Swedish Companies Registration Office (Bolagsverket), which is maintained

[10] Swedish firms pay taxes online, typically using a single form. Sweden is the second easiest country to pay taxes in according to the World Bank's Ease of Doing Business for 2008 (WBG (2008)).

by Statistics Sweden and Bisnode (a private data vendor), respectively. These databases contain balance sheet and income statement information for the entire population of limited liability companies in Sweden. For privacy reasons we cannot see firm names or other public identifiers, but we can track the same firm over time. We focus on limited liability businesses because the vast majority of sole proprietorships in Sweden are one-person, non-growth enterprises (e.g., Åstebro and Tåg (2017)). For example, limited liability corporations account for almost 90% of total business turnover in Sweden, while sole proprietorships and unlimited partnerships each make up just 1.7% of total turnover (Tax Statistical Yearbook of Sweden, 2013).

We also use information from the Swedish Tax Agency, who provided details on firm use of the tax deferment policy. All of the data sources have (anonymous) firm-specific identification numbers, which we use to merge information on use of the policy with the firm level data.[11] Table A.1 describes the data source and construction of the main variables we use in the study.

3.2 Sample construction

We build the sample in four steps. First, we focus on the years 2006 to 2013. This sample period gives us three years prior to the introduction of the lending program (2006-2008), and three years after the financial crisis abates (2011-2013). Second, we require firms to have (on average) more than one employee during the pre-program time period (2006-2008). We focus on multi-employee firms for two reasons: i) firms need to pay labor taxes and fees in order to use the lending program, and ii) the Swedish tax system makes it attractive for individuals to create shell companies for tax planning and income shifting reasons, so many of the single or no employee firms are not active enterprises. Third, we only include firms with an accounting period equivalent to the calendar year, which is the most common reporting period in Sweden. We do this to ensure that all firm-level outcomes are evaluated over the

[11] The data is at the establishment level. Roughly one quarter of the firms are part of a broader business group consisting of multiple establishments. As we show later, the results are unchanged if we focus only on single establishment firms, which ensures that the geographic fixed effects we control for in our preferred specification corresponds precisely to where the firm's economic activity takes place.

same time period. Last, we exclude firms in financial and regulated industries (codes 64-67 and 35-39 in the EU standard NACE Rev.2 classification).

After imposing these restrictions, we work with a sample of almost 600,000 firm-year observations from approximately 125,000 unique firms (we lose several of these observations and firms when we estimate regressions with multiple firm-level control variables). Table A.2 and Table A.3 in the Appendix show that the sample is representative of the Swedish economy in terms of both regional and industrial composition. Overall, 1,908 of our sampled firms used the lending program at some point in 2009.[12] Figure A.1 shows that of these "loan firms", roughly half used the loan in the program's first three months, when credit market conditions were particularly severe. The final column in Table A.2 shows that the fraction of firms using the facility is remarkably stable across regions. Table A.3 shows that firms in the manufacturing (retail and wholesale trade) sector used the lending program at higher (lower) rates relative to other industries.

It is notable that only around 2-3% of the Swedish firms we sample used the lending program. There are many potential explanations for such a low overall usage rate, including the fact that some firms may not have known about the program, while others did not need the liquidity. Perhaps most importantly, because program funds were directly tied to labor tax payments, the program offered little or no liquidity to firms with low wage bills. Although this characteristic of the policy's design undoubtedly limited the use and overall impact of the tax deferment option – and means that we are not in a position to draw any strong conclusions about the overall need for liquidity among Swedish firms or the aggregate economic effects of the Swedish policy – the design is helpful for empirically evaluating the micro-level effects of temporary access to liquidity in a crisis.

3.3 Descriptive statistics

Table 1 reports summary statistics for the main variables we use in the study. Panel A reports full sample descriptive statistics for the outcome variables we study, while Panel B

[12] Another 285 firms used the lending program in 2010, but we focus only on the firms that used the lending program in its first year. Excluding the 285 firms who used the lending program only in 2010 has no impact on our inferences.

reports statistics for other key firm characteristics over the pre-crisis period. The average (median) firm deleverages over the sample period, but there is considerable variation in debt usage across firms. For example, there is a deleveraging of about 17 percentage points at the 10^{th} percentile and an increase in leverage of 15 percentage points at the 90^{th} percentile. The average firm has a total wage bill of approximately 1.28 million SEK (about 170,000 US dollars) and is around 10 years old.

Figure 5 reports the annual level of *Debt* (total debt/total assets) for firms using the lending program relative to other firms during the sample period. Two facts stand out. First, firms that use the lending program are more leveraged both before and after the loan program period. Second, loan firms slightly increase leverage in 2008, the year before the loan was available, and more substantially in 2009, the year the loan was first available.[13] Notably, the average increase in leverage for loan firms in 2009 is 0.075. The loan firms then deleverage in 2011, the year the loan was due to be repaid in full.

Firms who do not use the government loan have stable leverage throughout the sample period. These firms also have consistently lower leverage than the firms using the loan program. This evidence highlights a key challenge in evaluating the effects of the lending program: although debt levels increased in the firms taking the loan relative to the firms that did not, the loan firms appear to have consistently higher demand for external finance, and may have increased leverage in the crisis even without the government policy. More generally, firms endogenously select into the program, and as such may be fundamentally different from other firms on observed and (potentially) unobserved dimensions. This selection problem means we cannot draw strong inferences about the effects of the program by simply comparing average outcomes in participating and non-participating firms.

[13] One explanation for this pattern is that firms who had recently increased leverage (in 2008) were more likely to find themselves credit constrained when the crisis hit (in 2009). Such an explanation is consistent with the evidence in Giroud and Mueller (2016) showing that employment losses in the Great Recession were larger for firms who had recently increased leverage.

4 Loan capacity, credit constraints and use of the lending program

As noted above, a key characteristic of the program is that the amount of liquidity it provided differed sharply across firms based on the size of their monthly labor tax payments and fees. Although the option to delay tax payments was available to essentially all Swedish limited liability corporations, the maximum amount of funding each firm could get from the lending program was twice the monthly amount of labor taxes and fees, which roughly corresponds to 9% of the firm's total annual wage bill. We thus define each firm's *Loan capacity* as 9% of the annual wage bill normalized by book value of total assets.[14] Clearly, higher *Loan capacity* firms stand to benefit more from the funding the program provides. In this way, the intensity of treatment from the program varies across firms based on their *ex ante Loan capacity*.

To illustrate the sharp heterogeneity in use and potential benefit of the lending program across the treatment intensity variable, Table 2 reports information on firm participation in the lending program for different quartiles of *Loan capacity*. Panel A reports firm counts (and overall sample shares) for the four *Loan capacity* quartiles, and Panel B shows the distribution of *Loan capacity* across the four quartiles. Only 1.7% of firms in the lowest quartile of *Loan capacity* use the lending program, compared to 3.6% in the fourth quartile. The average *Loan capacity* in Q4 (Q1) is 0.147 (0.010), indicating that the lending program offered additional liquidity corresponding to 14.7% (1%) of total assets. This amount of liquidity for firms in the fourth quartile of *Loan capacity* is substantial, and similar in magnitude to the sample average cash flow ratio reported in Table 1.[15]

The logistic regressions reported in Table 3 provide further evidence that *ex ante Loan capacity* strongly relates to participation in the lending program. We estimate the following

[14] We show later that the results are similar if we normalize by sales rather than assets.

[15] For proprietary reasons, we are not able to use information on the actual amount of funding each firm received from the program. We do know, however, that most participating firms took the maximum amount allowable (twice the monthly amount of total labor fees and taxes).

logistic regression

$$Takes\ loan_i = \sum_{k=1}^{4} \alpha_k \cdot Q_i^k + \mathbf{X}_i + \eta_j + \epsilon_i. \quad (1)$$

where *Takes loan* is a dummy variable equal to one if the firm delays making labor tax payments in 2009. In addition to the firm's *Loan capacity* quartile, we include a number of firm characteristics that may affect the demand for credit (represented by the vector **X**). All firm characteristics are averaged over the years 2006-2008, the years prior to the introduction of the program. The specification also contains industry fixed effects (η_j) to control for unobserved industry characteristics.

In column (1) of Table 3 we report estimates of Equation 1 without including the vector of firm characteristics. Firms with higher *Loan capacity* are significantly more likely to delay their labor tax payments. Column (2) shows that the firm characteristics relate to use of the lending facility in a plausible manner. After controlling for the absolute size of the wage bill (*log(Wage)*), firms are less likely to use the program if they generate more cash flow, enter the crisis with higher levels of cash reserves, make larger dividend payouts, or are older. In contrast, leverage ratios and sales are positively associated with use of the lending program. In general, these findings support the idea that firm use of the lending facility was driven in an important way by financing considerations. The only characteristic that differs from the conventional wisdom is firm size, which we think is likely due to the broad nature of our sample (covering an unusually large number of very small, private firms).[16] Column (3) shows that the strong positive relation between *Loan capacity* and use of the lending facility holds after controlling for the other firm characteristics.

In Table 4 we provide more evidence on the types of firms using the lending program. In Panel A we report program take-up rates for groups of firms sorted on standard characteristics associated with financing constraints (e.g., Whited and Wu (2006)). In the

[16] For instance, the average financially constrained firm in Hadlock and Pierce (2010) 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 firms in our sample that used the lending facility is roughly two million US dollars (or SEK 14.8 million).

first row we report take-up rates for the firms who are simultaneously below the sample median in cash flow, cash holdings, and age, and above the sample median in leverage. The economy-wide take-up rate is much larger in this sub-set of firms – just under 9% – and is increasing across *Loan capacity* quartiles. Among firms with "constrained" characteristics and a high *Loan capacity*, the take-up rate is over 10%. In sharp contrast, there is essentially no use of the program in the group of firms with "unconstrained" characteristics – above the sample median in cash flow, cash holdings, and age, and below the sample median in leverage – even when those firms have a high *Loan capacity*.

In Panel B of Table 4 we repeat this exercise for groups of firms above and below the sample median in terms of sales. Unlike the other standard indicators of a need for liquidity, larger firms are much more likely to use the program than smaller firms. Of course, one reason for the pattern in Table 4 is that funding from the program was a function of labor taxes and fees, which are potentially very small (even relative to total assets) in firms with below-median sales. However, the evidence in Table 3 shows that this is not the full story, as firm size is positively related to use of the lending program even after controlling for the size of the firm's wage bill.

5 Evaluating the effects of the tax deferment policy

5.1 Empirical specification

Our empirical tests focus on differences in the effects of the program *within* the sub-set of firms who take advantage of the lending program. These tests exploit the fact that participating firms with higher *Loan capacity* were more exposed to (or treated by) the policy, in the sense that they could gain relatively more liquidity than other firms. As we discuss in more detail below, this is an appropriate way to evaluate the program's effects as long as *Loan capacity* is unrelated to the firm outcomes we study in the absence of the policy reform.

We estimate the following specification:

$$\textit{Change in Debt}_{i,t} = \sum_{k=1}^{4} \alpha_k \cdot Q_i^k \times \textit{2009}_t \times \textit{Loan firm}_i + \sum_{k=1}^{4} \beta_k \cdot Q_i^k \times \textit{2009}_t + \mathbf{X}_i \times \textit{2009}_t + \eta_i + \eta_{j,t} + \eta_{r,t} + \epsilon_{i,t}. \quad (2)$$

In Equation 2, $\textit{Change in Debt}_{i,t}$ is the annual change in debt-to-assets for firm i in year t, Q_i^k is the firm's *Loan capacity* quartile, $\textit{2009}_t$ is an indicator variable equal to one in the year the liquidity program is operational, and $\textit{Loan firm}_i$ is an indicator variable equal to one if the firm participates in the lending program.[17] $\mathbf{X_i}$ is a vector containing the following firm level control variables averaged over the pre-loan program period (2006-2008) and then interacted with $\textit{2009}_t$: *Cash flow*, *Cash holdings*, *Dividends*, *Sales*, *Firm size* and *Firm age* (see Table A.1 for a description of the variables). The specification contains firm fixed effects (η_i) to control for unobserved firm characteristics, sector-year fixed effects ($\eta_{j,t}$) to control for time-varying industry characteristics such as business cycle effects, and region-year fixed effects ($\eta_{r,t}$) to control for time-varying regional characteristics.[18] We cluster standard errors at the firm level.

5.2 Graphical evidence

Figure 6 and Figure 7 report average debt-to-assets ratios from 2000 to 2013 in the four quartiles of treatment intensity (*Loan capacity*). Figure 6 reports the evolution of debt-to-assets for firms that ultimately use the lending program, and Figure 7 does the same for firms not using the program. To illustrate relative changes in leverage around the implementation of the lending program, we normalize the debt-to-assets ratio in each

[17] Estimating α_k implies estimating a triple difference-in-differences specification. Correctly specifying the triple difference-in-differences between loan capacity (Q_i^k), event year ($\textit{2009}_t$) and loan firm ($\textit{Loan firm}_i$) implies four different interaction terms (over and above estimating the three variables uninteracted): i) Q_i^k x $\textit{2009}_t$, ii) Q_i^k x $\textit{Loan firm}_i$, iii) $\textit{2009}_t$ x $\textit{Loan firm}_i$, and iv) Q_i^k x $\textit{2009}_t$ x $\textit{Loan firm}_i$. The interaction, Q_i^k x $\textit{Loan firm}_i$ and the uninteracted variables $\textit{Loan firm}_i$ and Q_i^k are time invariant and absorbed by the inclusion of the firm fixed effect (η_i).

[18] Statistics Sweden uses SNI codes to define industries, which are based on the European NACE classification. We define industries at the two digit levels. Also, Sweden is divided into 21 different regions (see Table A.2 for a list) which we use to sort firms in to different regions.

quartile by the quartile's average ratio during the pre-program time period (2000-2008). Among firms using the lending program (Figure 6), there is minimal time-series variation in debt-to-assets ratios across the four *Loan capacity* quartiles leading up to the financial crisis. Debt-to-asset ratios begin to increase for all four quartiles in 2008 (consistent with the evidence in Figure 5), but the differences across quartiles are not statistically or economically different. Importantly, as we show more formally below, there is no systematic association between *Loan capacity* and changes in debt-to-assets between 2007 and 2008 (e.g., the increase in debt-to-assets varies between 5% and 7% across the four *Loan capacity* quartiles, with the largest increase occurring in the second quartile). In 2009, however, debt-to-asset ratios increase sharply in participating firms, with the largest increase occurring in firms in the fourth quartile in treatment intensity, followed by firms in the third, second, and first quartiles, respectively. In sharp contrast, Figure 7 shows no differential pattern in leverage across *Loan capacity* quartiles in the firms that did not participate in the lending program.

5.3 Discussion of identifying assumption

The identifying assumption is that, absent the government program, leverage changes in the crisis would have been uncorrelated with firm *Loan capacity*. The evidence in Figure 6 is broadly supportive of this idea: at least in normal economic times, there is no systematic relation between leverage adjustments and *Loan capacity*. However, it is possible that the financial crisis per se, rather than the government policy response, caused firms with higher *Loan capacity* to disproportionately adjust leverage in 2009. For example, one potential concern is that because *Loan capacity* is a function of the firm's wage bill relative total assets, firms in the highest (lowest) *Loan capacity* quartile are also likely to have high (low) labor-to-capital ratios and relatively more (less) high-skilled workers. To the extent that models of financing constraints predict that constrained firms have higher labor-to-capital ratios (e.g., Garmaise (2008)), firms with higher labor-to-capital ratios may be more sensitive than other firms to business cycle fluctuations (that said, it is important to emphasize that there are no disproportionate leverage adjustments among the high *Loan capacity* firms who are not treated by the lending program, as shown in Figure 7).

One way to more formally evaluate this concern is to explore whether *Loan capacity* is correlated with leverage adjustments during other economic downturns – i.e., times when the economy slows but there is no government lending program. Although there are no recent economic downturns as severe as the financial crisis, the Swedish economy did slow considerably in 2001. We thus estimate versions of Equation 2 that treat 2001 as the placebo "event" year.[19] We use data covering 1998 to 2004 and define *Placebo* as a dummy variable taking on the value one in 2001, and zero otherwise. Column (1) in Table 5 shows that are no differential changes in debt ratios in 2001 across firms in different *Loan capacity* quartiles, where *Loan capacity* is measured over the 1998-2000 period. In column (2) we consider whether the firms who used the lending program in 2009 and were already operational in the early time period are particularly sensitive to business cycles. The estimate on the *Placebo* x *Loan firm* interaction is small and insignificant, showing that loan firms do not have significantly larger changes in debt compared to other firms in 2001. Moreover, column (3) shows that the triple interactions between the loan firm indicator, *Placebo*, and the *Loan capacity* quartile are all slightly *negative* but close to zero, indicating that there is no differential increase in leverage in firms with high *Loan capacity* following the onset of the 2001 recession.

Another potential concern is that participating firms were already increasing leverage in 2008, the year before they had access to the lending program. As noted above, an increase in leverage between 2007 and 2008 is only concerning for our approach to the extent that the change in debt is increasing across the treatment intensity quartiles. We formally explore this potential in the last three columns of Table 5. We estimate Equation 2 using a *Placebo* dummy that equals one in 2008, and zero otherwise. Column (4) shows that, across all firms, there is no association between *Loan capacity* quartile and changes in debt in 2008. In column (5), the coefficient on the *Placebo* x *Loan firm* interaction is positive and significant, indicating that leverage increases in 2008 for loan firms relative to other firms, as suggested by Figure 5. More importantly for our approach, however, the coefficients on the triple

[19] Most developed economies experienced a recession in 2001, and it was the only time GDP growth fell below 2% in Sweden during the 2000 to 2007 period.

interaction between Q_i^k, *Placebo*, and *Loan firm* reported in column (6) are all close to zero and statistically insignificant, showing no differences in leverage adjustments across loan firms in the different treatment intensity quartiles. Overall, these estimates show that while loan firms have larger changes in debt in 2008 relative to other (non-participating) firms, no significant differences across firms in the different *Loan capacity* quartiles emerge prior to the implementation of the liquidity provision program.

6 Results

6.1 The lending program and firm leverage

6.1.1 Baseline estimates

Table 6 reports estimates of Equation 2. We start by including only firm and (aggregate) year fixed effects; we show below how the results are affected when we include the more refined set of fixed effects and firm control variables. We estimate this regression using the full sample period (2006 to 2013) and with 2009_t as event year indicator. In this way, we explore whether *Change in Debt* for treated firms is differentially larger in 2009 relative all other years surrounding the program's implementation. We show later that our findings are robust to alternative sample periods, but this is a logical starting point for the leverage regressions because in all of the firms we study debt levels were "treated" by the program only in 2009. Thus, if a firm uses liquidity from the program to increase its net level of debt, debt growth should be higher in 2009 than in the years leading up to or following the program period. For other firm outcomes, such as investment, the relevant event window for evaluating the lending program is less obvious, an issue we return to below.[20]

We start in column (1) of Table 6 with a specification which includes only the interaction between 2009_t and $Loan\ firm_i$. This specification establishes how, on average, debt levels change for participating (treated) firms compared to other firms. The coefficient on the

[20] An alternative approach is to estimate Equation 2 with the *level* of debt as the dependent variable. In this case, a more appropriate treatment window is 2009-2010, because the firms had access to the funds in 2009 and did have to repay them until 2011. All of our inferences are similar if we use this alternative approach. Our focus on *Change in Debt* is consistent with the specification in Banerjee and Duflo (2014).

interaction term is 0.068, showing that the average *Change in Debt* in 2009 is significantly larger for participating firms than for other firms. This estimated change in debt is close to the average *Loan capacity* for firms participating in the lending program reported in Table 2. The effect is also similar in size to the reported change in debt-to-assets in Figure 5.

In column (2) we add interactions between 2009_t and Q_i^k to the specification. The coefficient estimate on the *2009* x *Loan firm* interaction remains positive and statistically significant and is identical in magnitude to the estimate in column (1). There is a positive and statistically significant (but small) coefficient on the 2009_t *x Q3* interaction term, but the coefficient estimates on the 2009_t *x Q2* and 2009_t *x Q4* interactions are near zero and statistically insignificant. Thus, although there is strong evidence that firms participating in the tax deferment program have larger increases in leverage than non-participating firms, there is no evidence that leverage adjustments are systematically related to *Loan capacity* in the full economy of (non-participating) firms.

The most important results are in column (3), where we include the triple interactions between Q_i^k, 2009_t, and $Loan\ firm_i$. The coefficient on the *2009* x *Loan firm* interaction remains positive and statistically significant, though the magnitude of the estimate falls by half (to 0.034). This coefficient estimate establishes the baseline effect of program participation for firms in the lowest treatment intensity quartile. The coefficients on the triple interaction terms are positive and increasing across the *Loan capacity* quartiles, though only the Q4 interaction term is statistically significant at conventional levels. These results show that changes in debt are substantially larger for the loan firms who are more exposed to (or treated by) the temporary lending program. Specifically, the estimates in column (3) suggest that participating in the loan program is associated with an increase in debt of approximately 0.105 in the "most treated" firms (Q4 in *Loan capacity*), compared to an increase of just 0.034 in participating firms with lowest treatment intensity.

In Table 7 we replace the aggregate year dummies with a full set of *Region* x *Year* and *Sector* x *Year* fixed effects. All specifications also include the double interaction between 2009_t and Q_i^k, though we do not report those estimates in the table. In column (1), the estimate on the *2009* x *Loan firm* interaction is identical in magnitude and significance to

the baseline estimate in Table 6. Similarly, including the triple interaction terms in column (2) shows that the change in debt is substantially larger for firms in the highest treatment intensity quartile, with magnitudes similar to the corresponding estimates in column (4) of Table 6.

In column (3) we include the set of firm-specific control variables interacted with the event year ($\mathbf{X_i}$ x 2009_t), and in column (4) we also include the full set of firm-specific control variables interacted with 2009_t and Q_i^k. Including all of the control variables reduces the number of observations from 598,767 to 470,345 due to differences in coverage of the firm variables. Nonetheless, the results in columns (3)-(4) are remarkably stable and consistent with our baseline results. The effect of loan program participation on *Change in Debt* is between 0.07 and 0.08 higher for firms in the fourth quartile of *Loan capacity* compared to firms in the first quartile. Note that the effects of program participation are increasing in a treatment intensity measure that is otherwise uncorrelated with changes in debt levels, and the observed increases in leverage across loan capacity quartiles are roughly consistent with how useful the loan program was to each firm based on its *ex ante Loan capacity*.

6.1.2 Robustness checks

We report the results of several additional robustness checks in Table 8. In columns (1)-(3) we use different sample periods. The first two columns report results using more narrow windows around the introduction of the lending facility. We find very similar results if we estimate the baseline specification using either 2007-2012 or 2008-2012 rather than 2006-2013. Column (3) shows that we also get similar results if we stop the sample in 2009, in which case we evaluate the effects of the program by comparing the change in debt in the year the program is introduced with changes in the pre-loan period. One notable result using the alternative samples is that the estimated effects for firms in the Q2 and Q3 treatment quartiles are also statistically larger than the effects for Q1 firms, which they were not in the baseline regressions.

In column (4) we report the main results focusing only on a sample of single-establishment firms. Excluding firms who belong to a business group reduces the sample size by around

20% but has no impact on our inferences about the effects of the lending program on firm changes in debt.

In the final two columns we redefine the loan capacity variable, normalizing by sales rather than total assets. We estimate the baseline regression with and without the vector of firm characteristics interacted with the event year ($\mathbf{X_i}$ x 2009_t). Columns (5) and (6) show that our main inferences are robust to the alternative measure of program treatment intensity.

6.2 Did the program relax liquidity constraints? Additional evidence

6.2.1 Sample splits based on ex ante borrowing costs

If the tax deferment policy relaxed liquidity constraints, the treatment effects of the program should be most pronounced in the firms who were disproportionately affected by the crisis. Given that the crisis severely limited the availability of risky debt, one potential way to identify the most affected firms is to sort on their pre-crisis borrowing costs. Although we do not observe each firm's marginal cost of debt financing, we do have information on their average interest cost per unit of debt going into the crisis period. Figure A.2 shows how participation in the loan program differs across firms sorted into quartiles based on interest costs in the pre-program period. Firms with higher interest costs are much more likely to participate in the loan program, which is consistent with those firms benefiting relatively more from the liquidity the program provided.

In Table 9 we report separate estimates of Equation 2 for sub-samples of firms sorted by pre-program borrowing costs. In the first two columns we include firms in the low (high) interest cost group if their interest costs in the pre-loan period (2006-2008) are below (above) the median, while in the last two columns we compare effects across firms in the first and fourth quartile of interest costs. In firms with relatively low *ex ante* borrowing costs (columns (1) and (3)), there are no significant differential effects across firms in the four *Loan capacity* quartiles. In contrast, columns (2) and (4) show that firms with relatively high interest costs have even larger differential treatment effects than the overall sample. For example, the

estimates in column (4) show that, among firms in the fourth quartile of interest costs, the differential *Change in Debt* between firms with the highest (Q4) and lowest (Q1) treatment intensity is 0.112, which is approximately 20% larger than the corresponding differential we reported for the full sample in column (4) of Table 7.

6.2.2 Investment in assets and the marginal return to capital

Although the results in the prior section are broadly consistent with the lending program mattering most where it *should*, a potential concern is that firms with higher borrowing costs simply took advantage of the program because it offered a sizeable subsidy relative to the (correct) market interest rate. We thus also explore whether the lending program affects firm investment and the marginal return to capital. Extending the logic of our previous tests, if the government policy relaxed a binding liquidity constraint, we expect to see a *differential* increase in asset accumulation in more treated firms. At the same time, evidence of a (differential) reduction in the marginal revenue product of capital in participating firms with higher *Loan capacity* also suggests that the policy relaxed liquidity constraints (see, e.g., Hsieh and Klenow (2009) and Larrain and Stumpner (2017)). Specifically, if firms invest such that the marginal product of capital equals the interest rate, the marginal product of capital should be relatively lower in the most treated firms, as they are relatively less constrained after the introduction of the program.[21]

Table 10 reports estimates of Equation 2 with $Investment_{i,t}$ as the dependent variable in columns (1)-(3), and $MRPK_{i,t}$ as the dependent variable in columns (4)-(6). We measure *MRPK* by taking each firm's average product of capital multiplied by its sectoral capital elasticity (see Table A.1 for the exact definitions and sources).[22] For these tests we focus on the 2006-2010 sample period and use the event indicator $2009\text{-}2010_t$, which is equal to one

[21] Note that our focus here is on differences within the subset of treated (loan) firms. To the extent that loan firms are more constrained than non-participating firms, they should have lower investment rates and a higher marginal product of capital, on average, as they do.

[22] We approximate a firm's capital stock by the book value of total assets. Our sample is dominated by very small firms (the median firm has three employees) and the quality in the total assets variable is consistent in the sample, compared to the inconsistent reporting across alternative asset variables. All the findings are similar if we subtract cash from total assets before computing the *Investment* and *MRPK* variables.

in 2009-2010, and zero otherwise.[23]

The first three columns in Table 10 show that firms using the lending program have a lower rate of investment than other (non-participating) firms during the crisis. This result is consistent with the idea that firms participating in the program are particularly sensitive to finance shocks (and the program did not fully relax the credit constraint these firms faced during the crisis).[24] More importantly for evaluating the effects of the lending program, participating firms with the highest treatment intensity (Q3 and Q4 in *Loan capacity*) expand assets significantly faster than the less heavily treated loan firms during the program period. Notably, depending on the specification, total investment is 11% to 17% higher in the most treated firms (Q4) than in participating firms with the lowest *Loan capacity*. The estimates are similar whether or not we include the Q^k x *2009-2010* interactions and the set of firm control variables. In addition, the estimates are also similar if we include the lagged dependent variable in the vector of firm control variables (not reported).

The last three columns in Table 10 show that program participation is also associated with a significantly lower *MRPK* in more heavily treated firms. In the specification with the Q^k x *2009-2010* interactions and full set of firm control variables (column (6)), the difference in *MRPK* between firms in the fourth and first quartiles of *Loan capacity* is -0.005. Not only is this differential highly statistically significant, but the magnitude is substantial, amounting to around 5% of the sample average *MRPK*.

7 Sales and employment growth after the crisis

We conclude with an analysis of the longer-run effects of the Swedish tax deferment policy. Our main findings suggest that the lending program helped to at least partially mitigated a transitory liquidity constraint in participating firms, but the extent to which this translates into better long-run outcomes is an open question. We provide some evidence on this question

[23] We do not include the post-crisis years to identify the program's effect on *Investment* and *MRPK* because, unlike the case of *Change in Debt*, which should only be affected during the year program funds were available, the program's effect on *Investment* and *MRPK* may extend beyond the program period.

[24] It is also worth noting that this finding is *inconsistent* with participating firms having systematically higher investment opportunities than non-participating firms.

with the following specification:

$$Y_{i,t} = \sum_{k=1}^{4} \alpha_k \cdot Q_s^k \times \textit{2009-2013}_t \times \textit{Loan firm}_i + \sum_{k=1}^{4} \beta_k \cdot Q_s^k \times \textit{2009-2013}_t + \mathbf{X}_i \times \textit{2009-2013}_t + \eta_i + \eta_{j,t} + \eta_{r,t} + \epsilon_{i,t}. \quad (3)$$

In Equation 3 the dependent variable ($Y_{i,t}$) is either *Sales growth* or *Employment growth*. The most important change from our main specification is that we switch from the $\textit{2009}_t$ indicator to $\textit{2009-2013}_t$, which equals one over the full post-program time period (2009-2013). In this way, we test whether more treatment by the lending program in 2009 is associated with differentially faster sales and employment growth during the full post-program time period.

Table 11 reports estimates of Equation 3 with *Sales growth* as the dependent variable in columns (1) and (2) and *Employment growth* in columns (3) and (4). The results in odd numbered columns are without firm controls and even numbered columns include the vector of firm control variables. The coefficient on the *Post* x *Loan firm* interaction is negative and significant in all specifications, while the coefficients on the triple interaction terms are all positive and significant. These estimates indicate that firms participating in the lending program tend to *underperform* non-participating firms in the post-crisis period, but that more exposure to the program (higher treatment intensity) substantially mitigates this under-performance. Notably, within the group of participating firms, the results suggest that sales growth and employment growth are significantly higher for firms in the Q2-Q4 treatment intensity quartiles compared to participating firms with the lowest treatment intensity. The results using *Sales growth* as the dependent variable have the expected increasing effect from Q1 to Q4 in treatment intensity, though the sharpest differential effect is between the lowest (Q1) treatment group and the rest of the participating firms (Q2-Q4). Similarly, the employment results show significantly larger effects in the Q2-Q4 treatment groups relative to the least treated group, but there is no meaningful difference in long-run performance across the Q2-Q4 treatment groups.

Overall, the evidence in Table 11 is broadly consistent with short-run liquidity from the 2009 lending program having a positive impact on long-run firm outcomes. For example, to the extent that use of the lending program indicates that firms were liquidity constrained, it is not surprising that participating (liquidity constrained) firms were more negatively affected by the financial crisis than other firms. Moreover, while firms in higher treatment intensity quartiles gained relatively more liquidity from the program, *all* participating firms gained some liquidity, and there is no reason to think the program *fully* mitigated short-run liquidity constraints, even in the more heavily treated firms.

8 Conclusion

We study the effects of a novel government policy, launched in Sweden in early 2009, which allowed firms to postpone paying all labor-related taxes and fees, treating any unpaid taxes as a loan from the government. Focusing on differences across participating firms with different exposure to the policy, we find that the temporary increase in liquidity from the tax deferment is positively associated with changes in net leverage and the level of real investment spending. In addition, liquidity from the policy is positively related to sales and employment growth in the post-crisis period.

Our findings contribute to important literatures on the effects of government lending programs and consequences of financial market disruptions. Despite widespread policy efforts to alleviate credit constraints in smaller firms with loan guarantees and targeted lending programs (e.g., Beck, Klapper, and Mendoza (2010); Bach (2014); Brown and Earle (2017)), there is little or no evidence on policy efforts to mitigate *transitory* finance shocks. By combining a unique policy directly but temporarily affecting corporate liquidity with administrative data on the full economy of Swedish firms, our study provides unique evidence on the potential impact temporary lending programs can have on economic activity.

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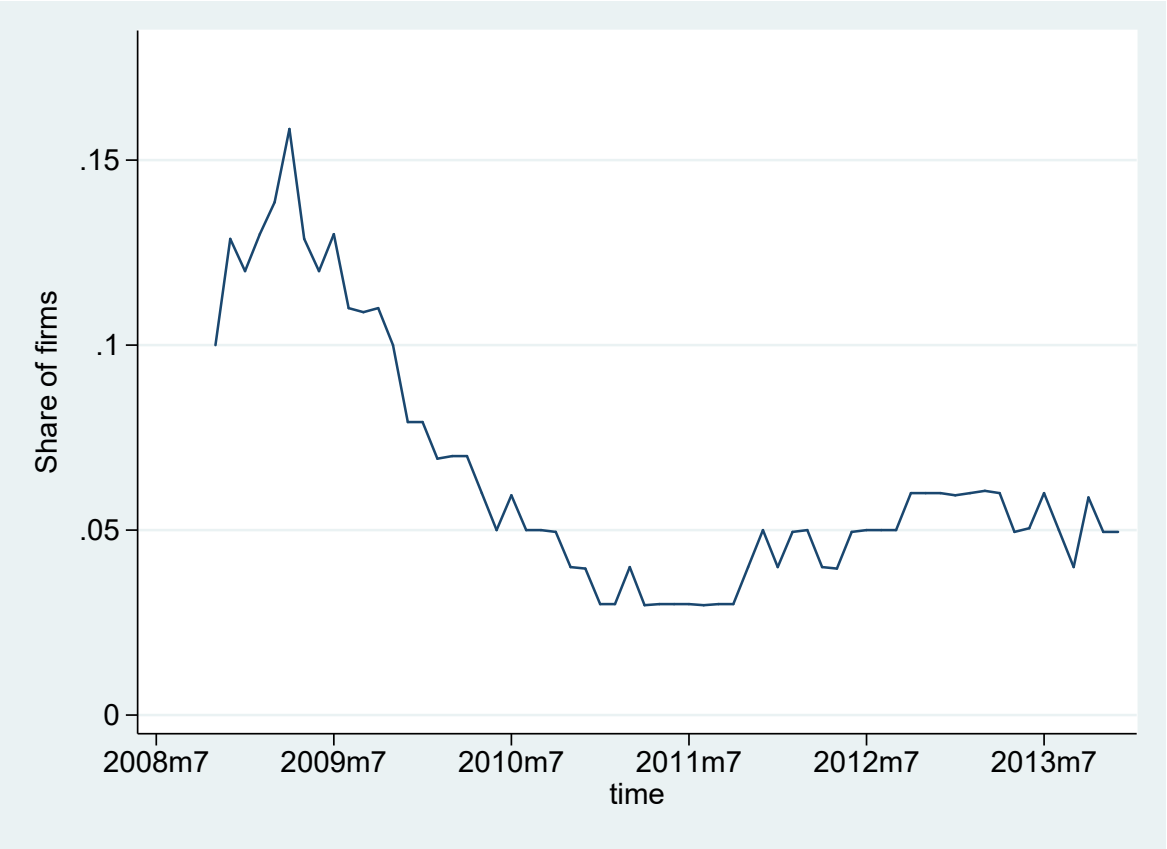

Figure 1: Share of firms stating it is "Considerably harder than normal" to access finance

Figure 1 reports the fraction of firms responding it is considerably harder than normal to access finance in Sweden. Source: monthly survey "Financing the firm's activities" conducted by National Institute of Economic Research. Note: The survey began in November 2008.

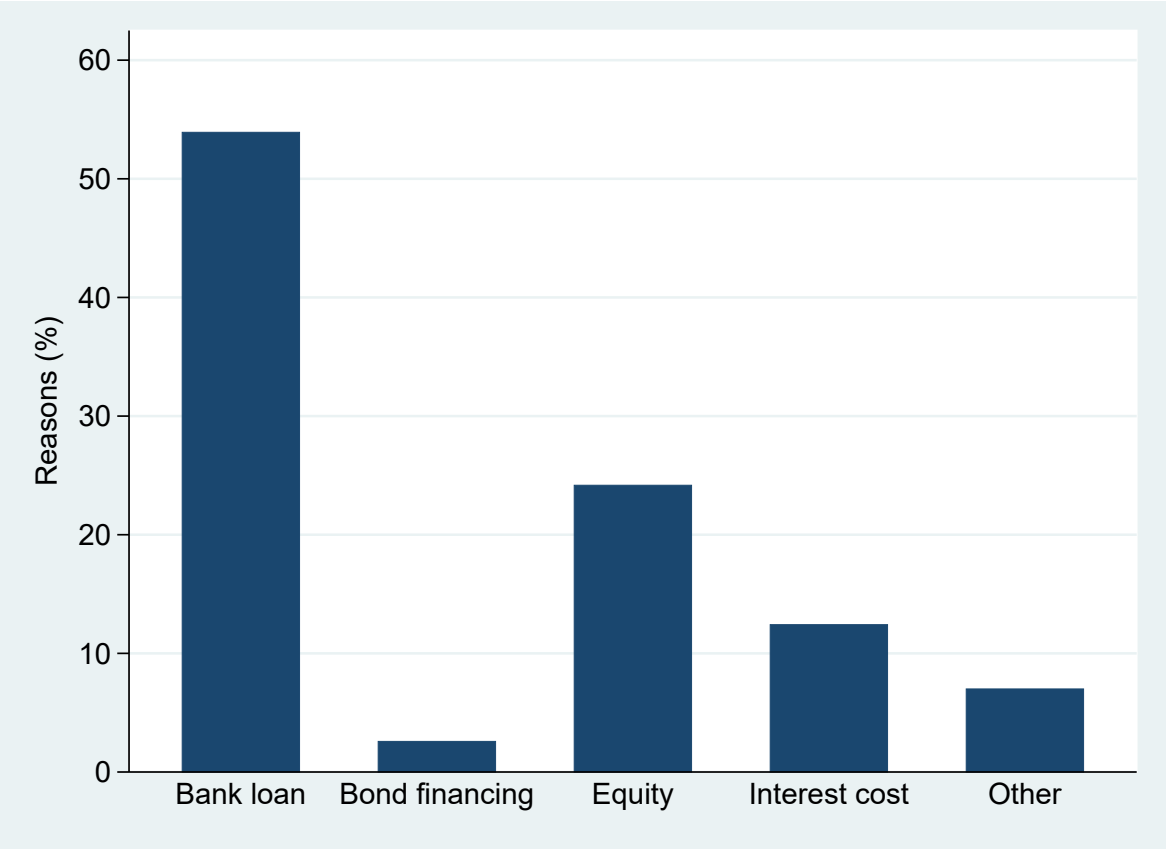

Figure 2: Reasons for why firms state it is "Harder than normal" to access finance in 2009

Figure 2 reports the distribution of reasons firms gave for why it is harder or much harder than normal to access finance in Sweden. "Bank loan" means firms found it hard to access finance through a bank loan (53.92% of respondents stated that), "Bond financing" means firms found it hard to access finance through bond financing (2.58% of respondents stated that), "Equity" means firms found it hard to access finance through issuing new equity (24.17% of respondents stated that), "Interest cost" means firms found it hard to access finance because of too high interest rates (12.42% of respondents stated that) and, "Other" means firms found it hard to access finance for some other reason (7.00% of respondents stated that). Source: monthly survey "Financing the firm's activities" conducted by National Institute of Economic Research.

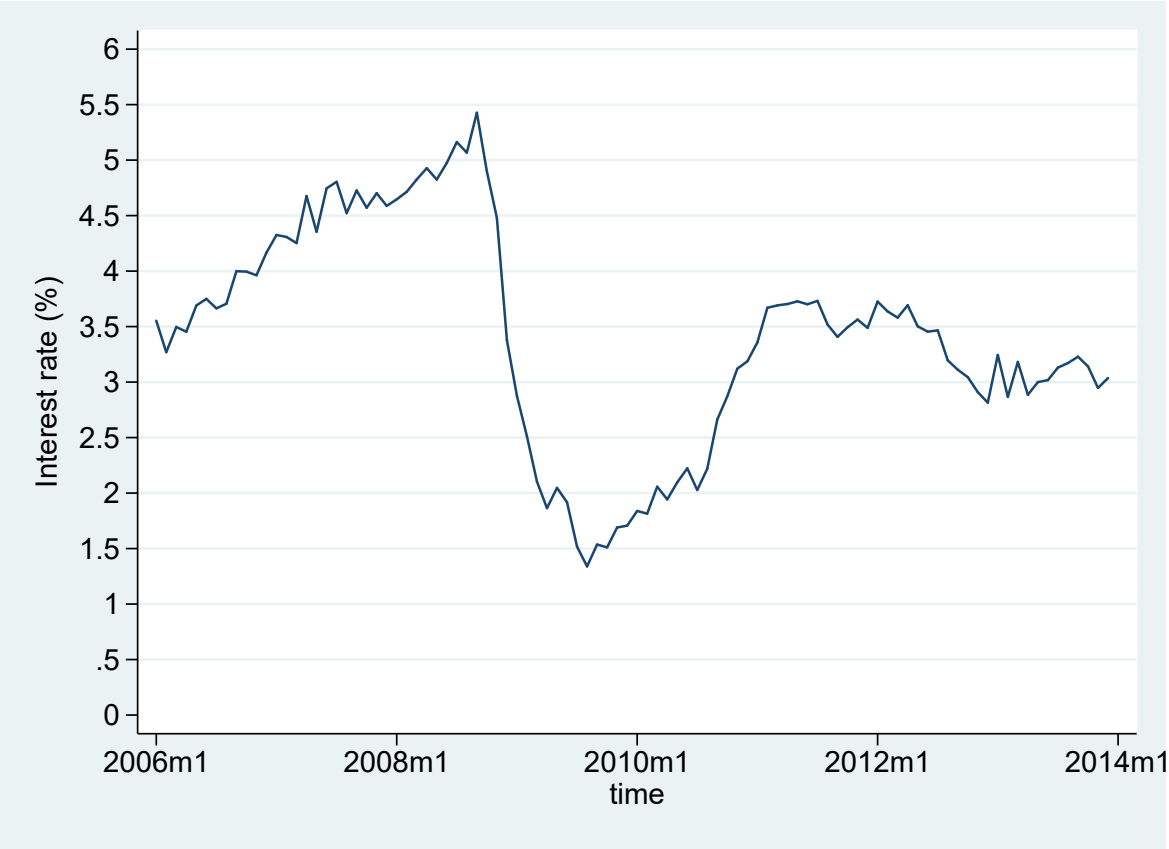

Figure 3: Interest rate on new loans to non-financial corporations

Figure 3 reports the interest rate charged for new loans to non-financial corporations at a monthly frequency. Source: Financial Markets Statistics, Statistics Sweden.

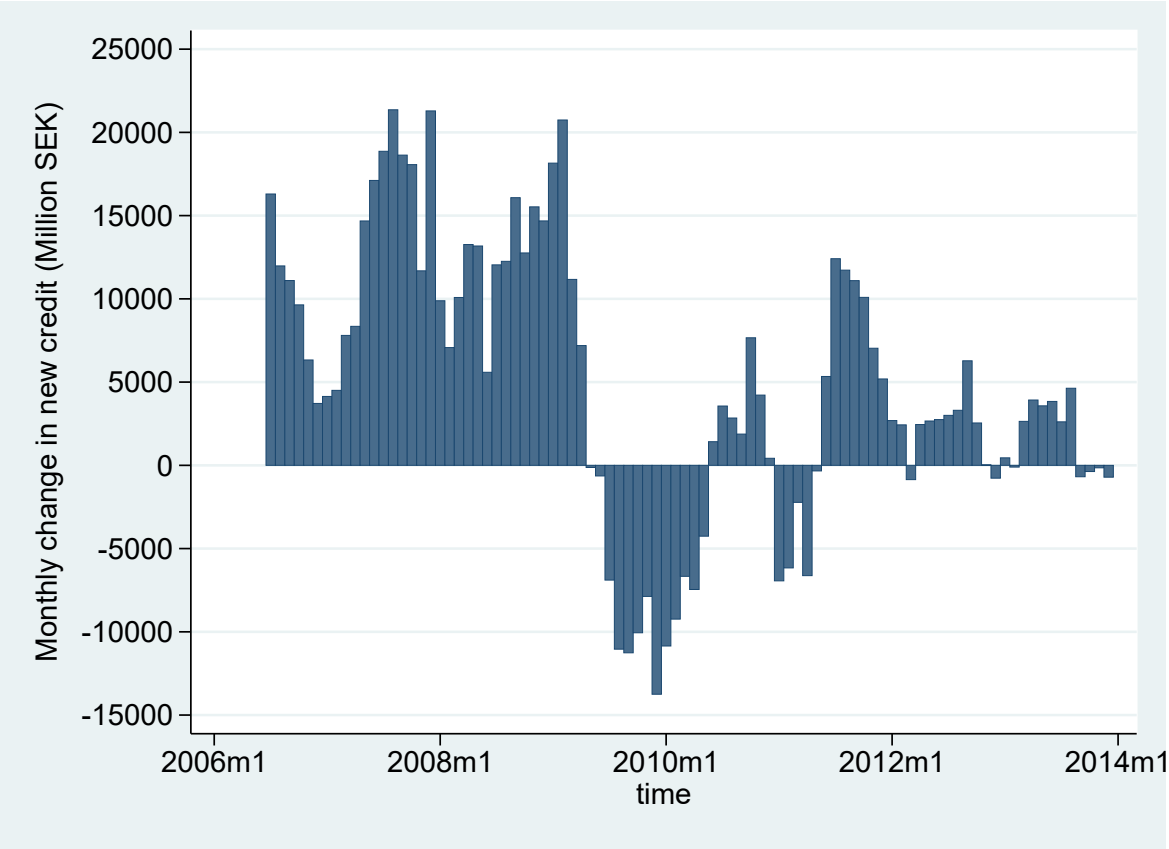

Figure 4: Monthly change in the value of loans to non-financial corporations.

Figure 4 reports the monthly change in new credit to non-financial corporations expressed in 2010 prices and as a six-month moving average. Source: Financial Markets Statistics, Statistics Sweden.

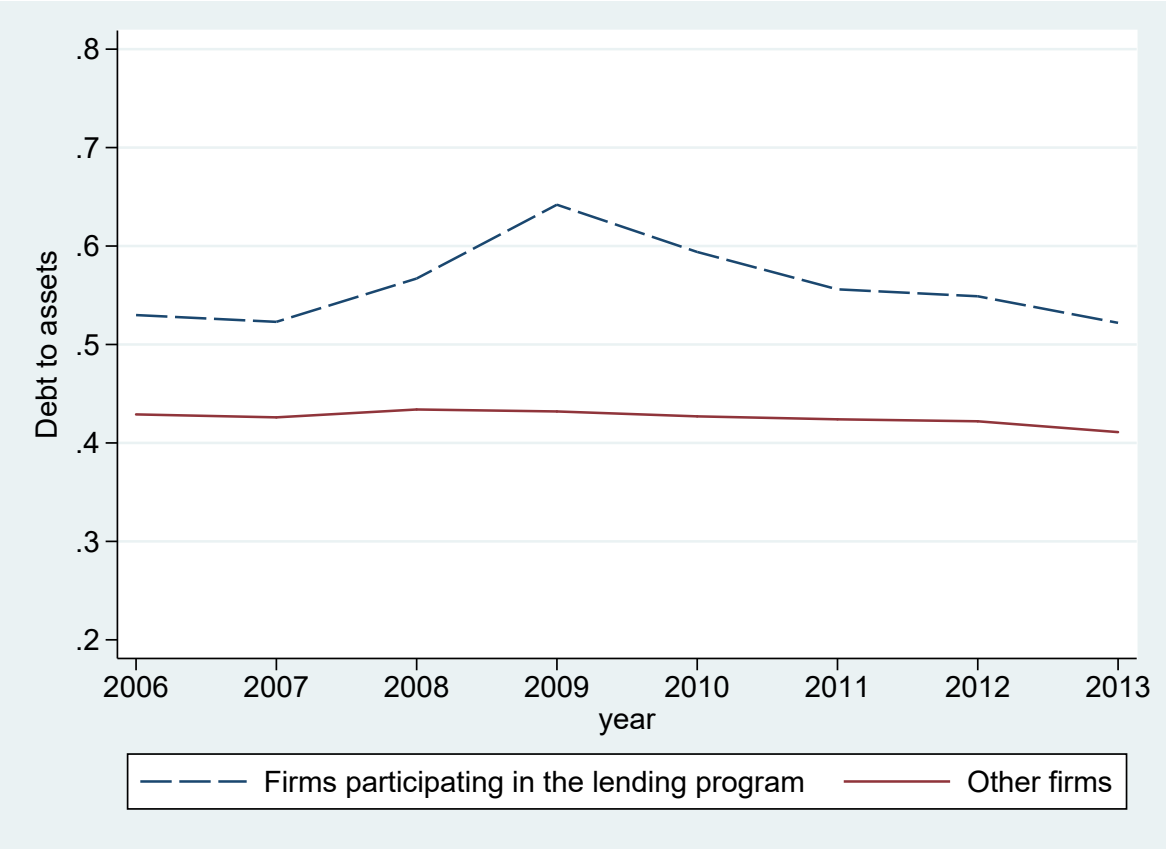

Figure 5: Debt to assets for loan firms vs. other firms

Figure 5 reports the annual value of debt to assets for firms participating in the lending program (dashed line) and other firms (solid line).

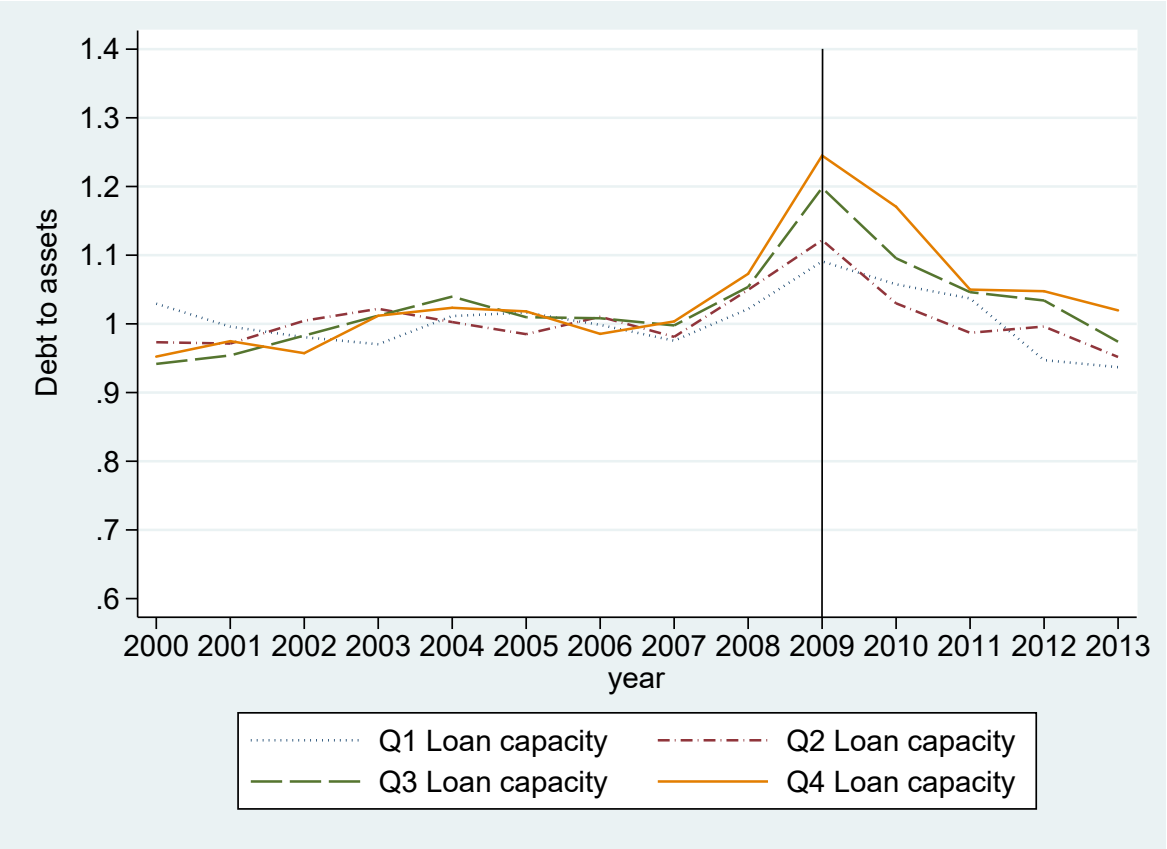

Figure 6: Debt to assets for firms participating in the lending program in 2009 across different levels of treatment intensity

Figure 6 reports debt to assets ratios for firms participating in the lending program for each quartile of treatment intensity. We normalize debt to assets across quartiles by its pre period average.

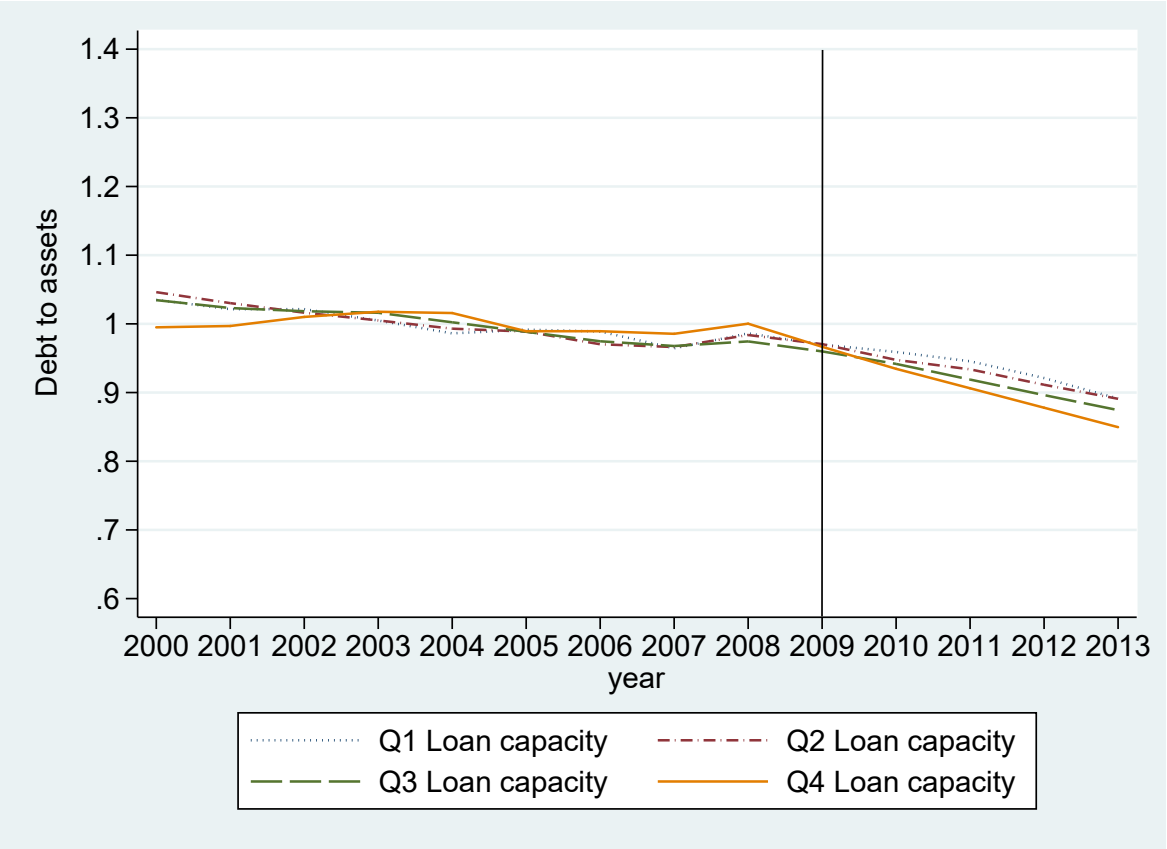

Figure 7: Debt to assets for firms not participating in the lending program in 2009 across different levels of treatment intensity

Figure 7 reports debt to assets ratios for firms not participating in the lending program for each quartile of treatment intensity. We normalize debt to assets across quartiles by its pre period average.

Table 1: Summary statistics

Table 1 reports summary statistics of the key variables used in this study. Detailed variable definitions are provided in Table A.1. N in panel A is number of firm-year observations and N in panel B is number of firms.

				Percentiles			Mean by quartile of *Loan capacity*$_i$			
	N	**Mean**	**SD**	**10**	**50**	**90**	**Q1**	**Q2**	**Q3**	**Q4**
				Panel A: Outcome variables						
Change in Debt$_{i,t}$	599,105	-0.008	0.213	-0.169	-0.008	0.150	-0.006	-0.006	-0.006	-0.007
MRPK$_{i,t}$	372,030	0.092	0.080	0.013	0.073	0.195	0.033	0.064	0.099	0.172
Investment$_{i,t}$	333,929	-0.001	0.460	-0.373	0.000	0.384	-0.019	0.003	0.005	0.000
				Panel B: Pre-loan period average firm characteristics						
Cash flow$_i$	63,277	0.144	0.217	-0.048	0.130	0.377	0.094	0.149	0.166	0.164
Cash holdings$_i$	63,283	0.269	0.267	0.007	0.187	0.664	0.248	0.246	0.279	0.302
Dividend$_i$	63,283	0.038	0.066	0.000	0.003	0.121	0.030	0.034	0.043	0.044
Sales$_i$	63,282	2.374	1.849	0.410	2.017	4.628	1.153	1.975	2.597	3.732
log(Wages)$_i$	67,368	14.062	1.543	12.396	14.066	15.920	13.294	14.175	14.288	14.398
log(Age)$_i$	68,257	2.363	0.950	0.896	2.599	3.540	2.538	2.481	2.344	2.102

Table 2: Loan capacity and loan program participation

Table 2 displays loan firm and loan capacity distributions across loan capacity quartiles. Panel A presents fraction and number of loan firms for the full sample and across loan capacity quartiles. Panel B presents 10^{th} percentile, mean, median, and the 90^{th} percentile loan capacity for the full sample and across loan capacity quartiles. Panel C presents 10^{th} percentile, mean, median, and the 90^{th} percentile loan capacity for the firms participating in the lending program and across loan capacity quartiles.

		Loan capacity quartiles:				
		All	**Q1**	**Q2**	**Q3**	**Q4**
		Panel A: Loan firms				
Fraction of loan firms		0.027	0.017	0.026	0.031	0.036
# of loan firms		1,908	280	446	539	643
		Panel B: Loan capacity				
Loan capacity$_i$	10^{th}	0.008	0.000	0.024	0.049	0.092
	Mean	0.065	0.010	0.034	0.064	0.147
	Median	0.047	0.011	0.033	0.063	0.127
	90^{th}	0.144	0.020	0.043	0.081	0.231
		Panel C: Loan capacity in loan firms only				
Loan capacity$_i$	10^{th}	0.017	0.002	0.025	0.049	0.095
	Mean	0.079	0.012	0.034	0.064	0.157
	Median	0.059	0.013	0.035	0.063	0.138
	90^{th}	0.171	0.021	0.044	0.081	0.254

Table 3: Determinants of loan program participation

Table 3 reports logistic regression estimates of Equation 1 with *Takes loan in 2009* as the dependent variable. Q_k is a dummy variable equal to one if the firm belongs to the k^{th} quartile in our treatment intensity variable (*Loan capacity*) averaged over the pre period (2006-2008). X_i include the following firm control variables (averaged over the pre loan program period (2006-2008)): *Cash flow*$_i$, *Debt*$_i$, *Cash holdings*$_i$, *Dividend*$_i$, *Sales*$_i$, *log(Wages)*$_i$ and *log(Age)*$_i$. The sample contains all private, non-financial limited liability companies in Sweden with more than one employee during the time period 2006-2008. Detailed variable definitions are provided in Table A.1. ***, **, and * stand for significance at the 1%, 5%, and 10% levels.

	(1)	(2)	(3)
Q_2	0.395		0.232
	(0.077)***		(0.085)***
Q_3	0.566		0.410
	(0.075)***		(0.086)***
Q_4	0.738		0.323
	(0.073)***		(0.095)***
Cash flow$_i$		-1.026	-1.016
		(0.123)***	(0.123)***
Debt$_i$		0.894	0.847
		(0.072)***	(0.074)***
log(Age)$_i$		-0.292	-0.287
		(0.028)***	(0.028)***
Cash holdings$_i$		-2.919	-2.995
		(0.231)***	(0.239)***
Dividend$_i$		-5.383	-5.547
		(0.903)***	(0.911)***
log(Wage)$_i$		0.549	0.550
		(0.018)***	(0.018)***
Sales$_i$		0.056	0.034
		(0.013)***	(0.016)***
Imdustry fixed effects	Yes	Yes	Yes
Observations	72,348	65,475	65,475

Table 4: Firm characteristics, loan capacity and loan program participation

Table 4 displays take up rate of firms across loan capacity quartiles. Panel A presents fraction of loan firms for a sample of firms that are *Low internal/High debt/Young* (*High internal/Low debt/Mature*) measured as below (above) the median in *Cash flow*, *Cash holdings*, *Dividend* and *log(Age)* and above (below) the median in *Debt* across loan capacity quartiles. Panel B presents fraction of loan firms for a sample of firms that are Large (Small) measured as above (below) the median in *log(Sales)* across loan capacity quartiles.

	Loan capacity quartiles:				
	All	**Q1**	**Q2**	**Q3**	**Q4**
	Panel A: Split on firm characteristics				
Low internal/High debt/Young	0.087	0.053	0.081	0.097	0.106
High internal/Low debt/Mature	0.001	0.004	0.001	0.001	0.001
	Panel B: Firm size (based on sales)				
Large	0.042	0.027	0.036	0.046	0.057
Small	0.014	0.011	0.012	0.015	0.019

Table 5: Placebo events

Table 5 reports OLS estimates of a version of Equation 2 with *Change in Debt* as the dependent variable. *Placebo* is an indicator variable taking on the value one (zero) in 2001 (1998-2000 and 2002-2004) in columns (1)-(3) and the sample period is 1998-2004. *Placebo* is an indicator variable taking on the value one (zero) in 2008 (2006-2007 and 2009-2013) and the sample period is 2006-2013 in columns (4)-(6). Q_k is a dummy variable equal to one if the firm belongs to the k^{th} quartile in our treatment intensity variable (*Loan capacity*) averaged over the pre period (1998-2000) in columns (1)-(3) and averaged over 2006-2007 in columns (4)-(6). *Loan firm* is an indicator variable taking on the value one (zero) if the firm takes (does not take) the loan in 2009. The sample contains all private, non-financial limited liability companies in Sweden with more than one employee during the time period 1998-2004 or 2006-2013. Detailed variable definitions are provided in Table A.1. The standard errors are clustered at the firm level. ***, **, and * stand for significance at the 1%, 5%, and 10% levels.

	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
		Placebo: 2001			*Placebo: 2008*	
Q_2 x *Placebo*	0.003		0.003	0.000		0.000
	(0.002)		(0.002)	(0.002)		(0.002)
Q_3 x *Placebo*	0.001		0.001	0.001		0.001
	(0.002)		(0.003)	(0.002)		(0.002)
Q_4 x *Placebo*	-0.002		-0.002	0.000		0.000
	(0.003)		(0.003)	(0.003)		(0.003)
Placebo x *Loan firm*		0.007	0.019		0.024	0.027
		(0.008)	(0.029)		(0.006)***	(0.013)**
Q_2 x *Placebo* x *Loan firm*			-0.034			0.005
			(0.033)			(0.018)
Q_3 x *Placebo* x *Loan firm*			-0.008			-0.018
			(0.030)			(0.019)
Q_4 x *Placebo* x *Loan firm*			-0.007			0.004
			(0.032)			(0.019)
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	375,536	375,536	375,536	599,105	599,105	599,105

Table 6: Loan program participation and change in debt

Table 6 reports OLS estimates from estimating Equation 2 with *Change in Debt* as the dependent variable. 2009_t is an indicator variable taking on the value one (zero) in 2009 (2006-2008 and 2010-2013). Q_k is a dummy variable equal to one if the firm belongs to the k^{th} quartile in our treatment intensity variable (*Loan capacity*) averaged over the pre period (2006-2008). *Loan firm* is an indicator variable taking on the value one (zero) if the firm takes (does not take) the loan in 2009. The sample contains all private, non-financial limited liability companies in Sweden with more than one employee during the time period 2006-2013. Detailed variable definitions are provided in Table A.1. The standard errors are clustered at the firm level. ***, **, and * stand for significance at the 1%, 5%, and 10% levels.

	(1)	**(2)**	**(3)**
2009_t x *Loan firm*$_i$	0.068	0.068	0.034
	$(0.007)^{***}$	$(0.007)^{***}$	$(0.013)^{***}$
Q_2 x 2009_t		-0.001	-0.001
		(0.002)	(0.002)
Q_3 x 2009_t		0.004	0.004
		$(0.002)^{*}$	(0.002)
Q_4 x 2009_t		-0.002	-0.003
		(0.003)	(0.003)
Q_2 x 2009_t x *Loan firm*$_i$			0.017
			(0.017)
Q_3 x 2009_t x *Loan firm*$_i$			0.025
			(0.017)
Q_4 x 2009_t x *Loan firm*$_i$			0.071
			$(0.021)^{***}$
Firm fixed effects	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes
Observations	599,105	599,105	599,105

Table 7: Loan program participation and change in debt: Additional fixed effects and firm characteristics

Table 7 reports OLS estimates from estimating Equation 2 with *Change in Debt* as the dependent variable. 2009_t is an indicator variable taking on the value one (zero) in 2009 (2006-2008 and 2010-2013). Q_k is a dummy variable equal to one if the firm belongs to the k^{th} quartile in our treatment intensity variable (*Loan capacity*) averaged over the pre period (2006-2008). *Loan firm* is an indicator variable taking on the value one (zero) if the firm takes (does not take) the loan in 2009. Q^k x *2009* are the interactions with Q_2, Q_3 and Q_4 with 2009_t. X_i include the following firm control variables (averaged over the pre loan program period (2006-2008)): $Cash\ flow_i$, $Cash\ holdings_i$, $Dividend_i$, $Sales_i$, $log(Wages)_i$ and $log(Age)_i$. The sample contains all private, non-financial limited liability companies in Sweden with more than one employee during the time period 2006-2013. Detailed variable definitions are provided in Table A.1. The standard errors are clustered at the firm level. ***, **, and * stand for significance at the 1%, 5%, and 10% levels.

	(1)	**(2)**	**(3)**	**(4)**
2009_t x *Loan firm*$_i$	0.068	0.033	0.034	0.032
	(0.007)***	(0.013)***	(0.011)***	(0.011)***
Q_2 x 2009_t x *Loan firm*$_i$		0.018	0.020	0.019
		(0.017)	(0.015)	(0.016)
Q_3 x 2009_t x *Loan firm*$_i$		0.025	0.024	0.021
		(0.017)	(0.016)	(0.016)
Q_4 x 2009_t x *Loan firm*$_i$		0.070	0.074	0.082
		(0.021)***	(0.020)***	(0.021)***
Firm fixed effects	Yes	Yes	Yes	Yes
Region x Year fixed effects	Yes	Yes	Yes	Yes
Sector x Year fixed effects	Yes	Yes	Yes	Yes
Q^k x *2009*	Yes	Yes	Yes	Yes
X_i x *2009*	No	No	Yes	Yes
Q^k x X_i x *2009*	No	No	No	Yes
Observations	598,767	598,767	470,345	470,345

Table 8: Loan program participation and change in debt: Robustness checks

Table 8 reports OLS estimates from estimating Equation 2 with *Change in Debt* as the dependent variable. 2009_t is an indicator variable taking on the value one (zero) in 2009 (2006-2008 and 2010-2013). Q_k is a dummy variable equal to one if the firm belongs to the k^{th} quartile in our treatment intensity variable (*Loan capacity*) averaged over the pre period (2006-2008). *Loan firm* is an indicator variable taking on the value one (zero) if the firm takes (does not take) the loan in 2009. Q^k x *2009* are the interactions with Q_2, Q_3 and Q_4 with 2009_t. Specifications in columns (1)-(3) use data for the the time windows 2007-2012, 2008-2011, and 2006-2009 respectively. The specification in column (4) include only the firms that are not part of a business group. X_i include the following firm control variables (averaged over the pre loan program period (2006-2008)): $Cash\ flow_i$, $Cash\ holdings_i$, $Dividend_i$, $Sales_i$, $log(Wages)_i$ and $log(Age)_i$. The sample contains all private, non-financial limited liability companies in Sweden with more than one employee during the time period 2006-2013. Detailed variable definitions are provided in Table A.1. The standard errors are clustered at the firm level. ***, **, and * stand for significance at the 1%, 5%, and 10% levels.

	(1)	(2)	(3)	(4)	(5)	(6)
		Sample period:		*Standalone*	*Treatment intensity sort:*	
	2007-2012	*2008-2011*	*2006-2009*	*firm*	*Loan capacity over sales*	
2009_t x *Loan firm*$_i$	0.029	0.026	0.019	0.030	0.038	0.038
	(0.012)**	(0.013)**	(0.013)	(0.014)**	(0.013)***	(0.013)***
Q_2 x 2009_t x *Loan firm*$_i$	0.029	0.030	0.032	0.022	0.003	0.007
	(0.016)*	(0.018)*	(0.017)*	(0.020)	(0.018)	(0.019)
Q_3 x 2009_t x *Loan firm*$_i$	0.029	0.032	0.035	0.029	0.022	0.030
	(0.016)*	(0.018)*	(0.017)**	(0.029)	(0.016)	(0.017)*
Q_4 x 2009_t x *Loan firm*$_i$	0.078	0.093	0.070	0.085	0.075	0.068
	(0.020)***	(0.023)***	(0.022)***	(0.025)***	(0.021)***	(0.021)***
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Region x Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Sector x Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Q^k x *2009*	Yes	Yes	Yes	Yes	Yes	Yes
X_i x *2009*	Yes	Yes	Yes	Yes	No	Yes
Observations	358,158	241,357	250,737	374,462	598,767	470,345

Table 9: Loan program participation and change in debt: Varying interest costs

Table 9 reports OLS estimates from estimating Equation 2 with *Change in Debt* as the dependent variable. 2009_t is an indicator variable taking on the value one (zero) in 2009 (2006-2008 and 2010-2013). Q_k is a dummy variable equal to one if the firm belongs to the k^{th} quartile in our treatment intensity variable (*Loan capacity*) averaged over the pre period (2006-2008). *Loan firm* is an indicator variable taking on the value one (zero) if the firm takes (does not take) the loan in 2009. Q^k x *2009* are the interactions with Q_2, Q_3 and Q_4 with 2009_t. X_i include the following firm control variables (averaged over the pre loan program period (2006-2008)): $Cash\ flow_i$, $Cash\ holdings_i$, $Dividend_i$, $Sales_i$, $log(Wages)_i$ and $log(Age)_i$. Firms are sorted in to low (high) based on if they are below (above) the median in terms of interest costs in the pre loan program period (2006-2008) in columns (1) ((2)) and firms are sorted in to Q1 (Q4) based on if they are in the bottom (top) quartile in terms of interest costs in the pre loan program period (2006-2008) in columns (3) ((4)). The sample contains all private, non-financial limited liability companies in Sweden with more than one employee during the time period 2006-2013. Detailed variable definitions are provided in Table A.1. The standard errors are clustered at the firm level. ***, **, and * stand for significance at the 1%, 5%, and 10% levels.

	(1)	**(2)**	**(3)**	**(4)**
			Interest cost:	
	Low	*High*	*Q1*	*Q4*
2009_t x *Loan firm*$_i$	0.060	0.026	0.047	0.028
	(0.025)**	(0.012)**	(0.036)	(0.016)*
Q_2 x 2009_t x *Loan firm*$_i$	-0.010	0.022	-0.034	0.034
	(0.036)	(0.027)	(0.047)	(0.023)
Q_3 x 2009_t x *Loan firm*$_i$	0.017	0.028	0.084	0.034
	(0.035)	(0.017)*	(0.058)	(0.023)
Q_4 x 2009_t x *Loan firm*$_i$	0.041	0.091	0.018	0.112
	(0.035)	(0.027)***	(0.053)	(0.038)***
Firm fixed effects	Yes	Yes	Yes	Yes
Region x Year fixed effects	Yes	Yes	Yes	Yes
Sector x Year fixed effects	Yes	Yes	Yes	Yes
Q^k x *2009*	Yes	Yes	Yes	Yes
X_i x *2009*	Yes	Yes	Yes	Yes
Observations	236,880	232,797	115,765	111,846

Table 10: Loan program participation, investment in assets and return to capital

Table 10 reports OLS estimates from estimating Equation 2 with *Investment* as the dependent variable in columns (1)-(3) and *MRPK* in columns (4)-(6). *2009-2010*$_t$ is an indicator variable taking on the value one (zero) in 2009-2010 (2006-2008). Q_k is a dummy variable equal to one if the firm belongs to the k^{th} quartile in our treatment intensity variable (*Loan capacity*) averaged over the pre period (2006-2008). *Loan firm* is an indicator variable taking on the value one (zero) if the firm takes (does not take) the loan in 2009. Q^k x *2009-2010* are the interactions with Q_2, Q_3 and Q_4 with *2009-2010*$_t$. X_i include the following firm control variables (averaged over the pre loan program period (2006-2008)): *Cash flow*$_i$, *Cash holdings*$_i$, *Dividend*$_i$, *Sales*$_i$, *log(Wages)*$_i$ and *log(Age)*$_i$. The sample contains all private, non-financial limited liability companies in Sweden with more than one employee during the time period 2006-2010. Detailed variable definitions are provided in Table A.1. The standard errors are clustered at the firm level. ***, **, and * stand for significance at the 1%, 5%, and 10% levels.

	(1)	(2)	(3)	(4)	(5)	(6)
		Investment			*MRPK*	
2009-2010$_t$ x *Loan firm*$_i$	-0.187	-0.176	-0.165	0.006	0.000	0.001
	(0.035)***	(0.035)***	(0.035)***	(0.000)***	(0.000)	(0.000)***
Q_2 x *2009-2010*$_t$ x *Loan firm*$_i$	0.051	0.055	0.035	-0.004	-0.001	-0.002
	(0.039)	(0.040)	(0.039)	(0.001)***	(0.001)	(0.001)**
Q_3 x *2009-2010*$_t$ x *Loan firm*$_i$	0.133	0.122	0.098	-0.008	-0.002	-0.003
	(0.039)***	(0.039)***	(0.039)***	(0.001)***	(0.001)***	(0.001)***
Q_4 x *2009-2010*$_t$ x *Loan firm*$_i$	0.173	0.131	0.112	-0.018	-0.005	-0.005
	(0.040)***	(0.039)***	(0.040)***	(0.001)***	(0.001)***	(0.001)***
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Region x Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Sector x Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Q^k x *2009-2010*	No	Yes	Yes	No	Yes	Yes
X_i x *2009-2010*	No	No	Yes	No	No	Yes
Observations	333,929	333,929	309,335	372,030	372,030	321,098

Table 11: Loan program participation and the long term: Sales and employment

Table 11 reports OLS estimates from estimating Equation 3 with *Sales growth* and *Employment growth* as the dependent variable in columns (1)-(2) and (3)-(4) respectively. *2009-2013*$_t$ is an indicator variable taking on the value one (zero) in 2009-2013 (2006-2008). Q_k is a dummy variable equal to one if the firm belongs to the k^{th} quartile in our treatment intensity variable (*Loan capacity*) averaged over the pre period (2006-2008). *Loan firm* is an indicator variable taking on the value one (zero) if the firm takes (does not take) the loan in 2009. Q^k x *2009-2013* are the interactions with Q_2, Q_3 and Q_4 with *2009-2013*$_t$. Specifications in columns (2) and (4) include the following firm control variables (averaged over the pre loan program period (2006-2008)) interacted with *2009-2013*$_t$: *Cash flow*$_i$, *Cash holdings*$_i$, *Dividend*$_i$, *Sales*$_i$, *Firm size*$_i$ and *Firm age*$_i$. The sample contains all private, non-financial limited liability companies in Sweden with more than one employee during the time period 2006-2013. Detailed variable definitions are provided in Table A.1. The standard errors are clustered at the firm level. ***, **, and * stand for significance at the 1%, 5%, and 10% levels.

	(1)	(2)	(3)	(4)
	Sales growth		*Employment growth*	
2009-2013$_t$ x *Loan firm*$_i$	-0.179	-0.178	-0.136	-0.131
	(0.047)***	(0.048)***	(0.025)***	(0.025)***
Q_2 x *2009-2013*$_t$ x *Loan firm*$_i$	0.095	0.091	0.054	0.054
	(0.054)*	(0.055)*	(0.028)*	(0.028)*
Q_3 x *2009-2013*$_t$ x *Loan firm*$_i$	0.102	0.099	0.061	0.061
	(0.051)**	(0.052)*	(0.027)**	(0.027)**
Q_4 x *2009-2013*$_t$ x *Loan firm*$_i$	0.116	0.115	0.054	0.055
	(0.051)**	(0.052)**	(0.027)**	(0.028)**
Firm control variables	No	Yes	No	Yes
Firm fixed effects	Yes	Yes	Yes	Yes
Region x Year fixed effects	Yes	Yes	Yes	Yes
Sector x Year fixed effects	Yes	Yes	Yes	Yes
Q^k x *2009-2013*	Yes	Yes	Yes	Yes
Observations	559,797	449,037	519,166	429,697

A Appendix tables and figures

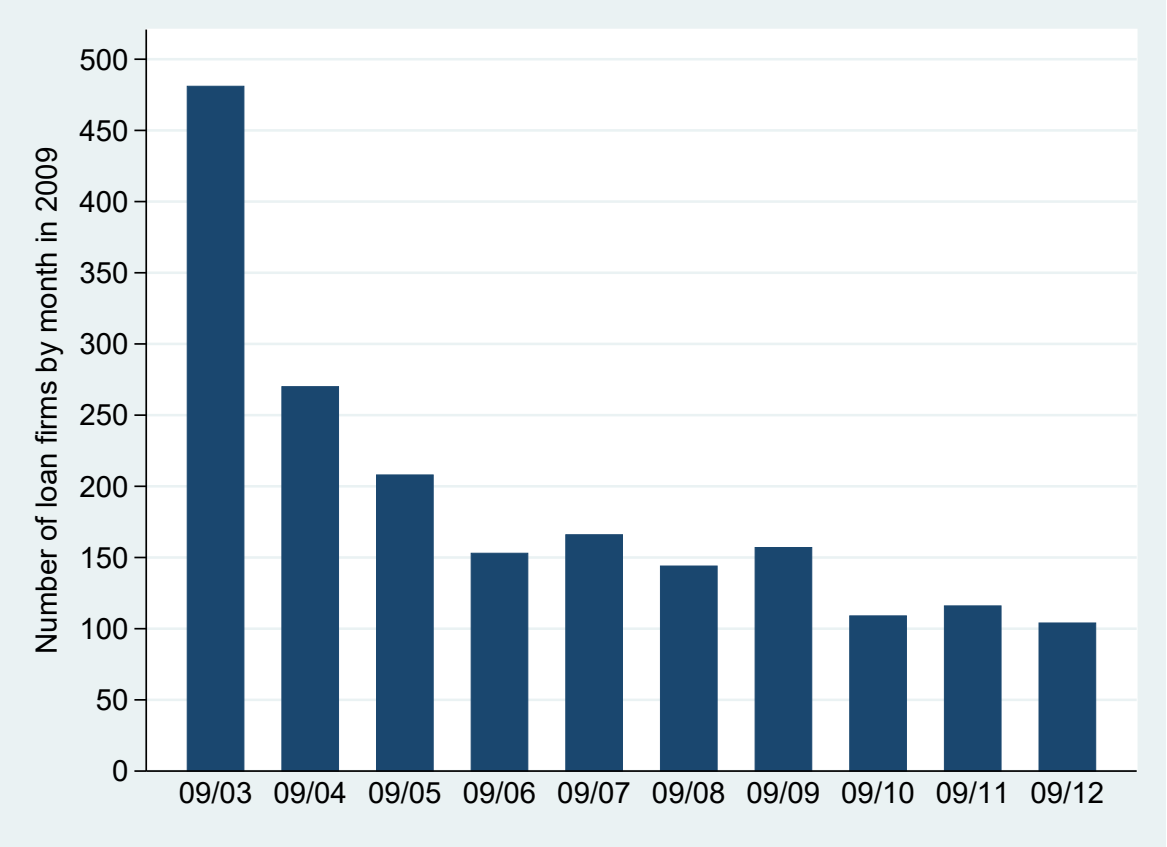

Figure A.1: Number of loan firms by month

Figure A.1 reports the number of firms taking the loan each month in 2009.

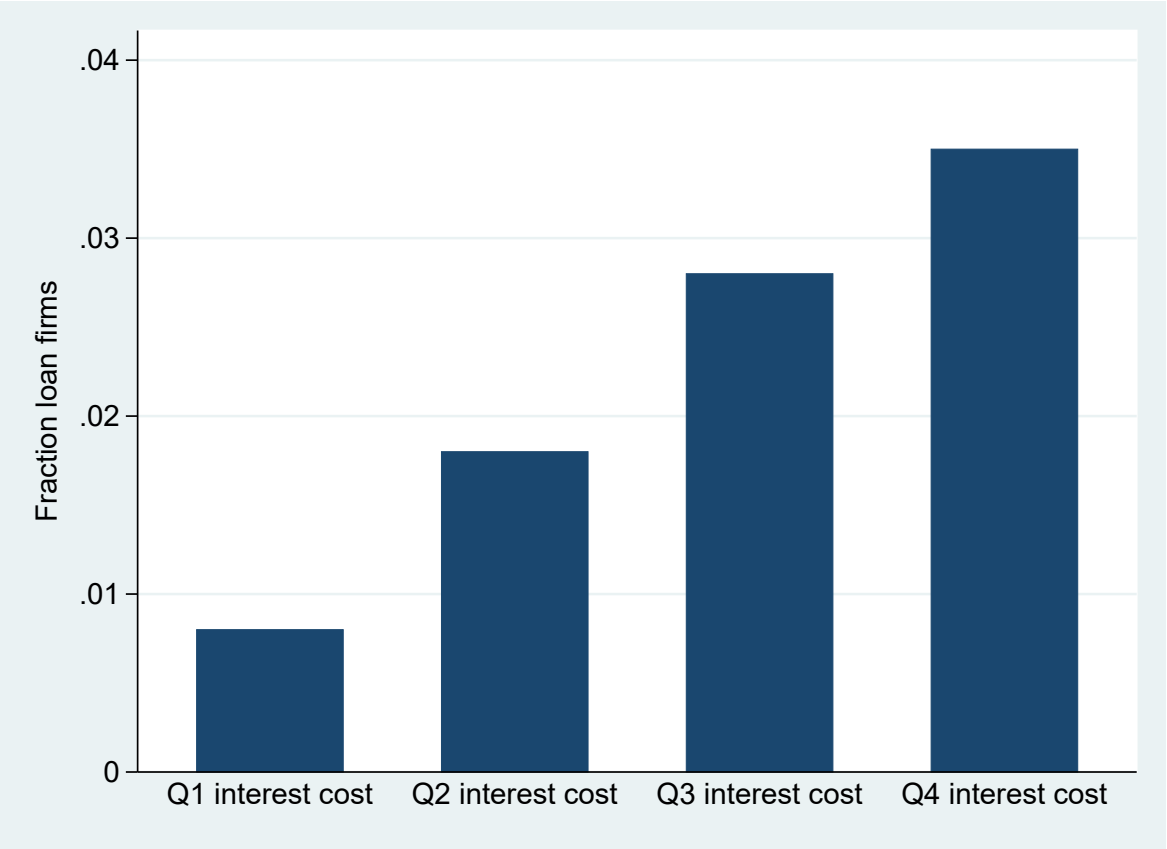

Figure A.2: Fraction of loan firms by interest cost quartiles

Figure A.2 reports the fraction of loan firms in each interest cost quartile based on sorting all firms in terms of interest cost divided by total debt averaged over 2006-2008.

Table A.1: Description of the variables

Variable	Description
	Outcome variables
Change in Debt$_{i,t}$	Annual change in *Debt*. *Debt* is defined as total debt divided by book value of total assets and Winsorized at the 1% level. Source: Statistics Sweden.
$MRPK_{i,t}$	Marginal revenue product of capital (MRPK) is defined as in Hsieh and Klenow (2009): $\alpha_{jt}*((\sigma\text{-}1)/\sigma)*(Y/K)_i$. Where i) α_{jt} is the elasticity of output with respect to capital and is defined at the two digit SNI code level using a value added approach and collected from Statistics Sweden, ii) σ is the elasticity of substitution and set to 3 (in line with the literature), iii) $(Y/K)_i$ is value added divided by the book value of total assets. Value added is computed as profits plus wages, and iv) Winsorized at the 1% level. Source: Statistics Sweden.
Investment$_{i,t}$	The annual log change in book value of total assets and Winsorized at the 1% level. Source: Statistics Sweden.
	Pre-loan period average firm characteristics
Cash flow$_i$	Cash flow divided by the beginning of the period book value of total assets, Winsorized at the 1% level and averaged over the pre-loan period 2006-2008. Source: Statistics Sweden.
Cash holdings$_i$	Cash holdings divided by the beginning of the period book value of total assets, Winsorized at the 1% level and averaged over the pre-loan period 2006-2008. Source: Statistics Sweden.

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$Dividend_i$	Dividends divided by the beginning of the period book value of total assets, Winsorized at the 1% level and averaged over the pre-loan period 2006-2008. Source: Statistics Sweden.
$Sales_i$	Sales divided by the beginning of the period book value of total assets, Winsorized at the 1% level and averaged over the pre-loan period 2006-2008. Source: Statistics Sweden.
$log(Wages)_i$	Natural logarithm of the total wage bill, Winsorized at the 1% level and averaged over the pre-loan period 2006-2008. Source: Statistics Sweden.
$log(Age)_i$	Natural logarithm of one plus number of years since incorporation and averaged over the pre-loan period 2006-2008. Source: Statistics Sweden.
$Loan\ capacity_i$	0.09 multiplied by the total wage bill and then divided by book value of total assets, Winsorized at the 1% level and averaged over the pre-loan period 2006-2008. Source: Statistics Sweden.

Table A.2: Sample characteristics across regions in Sweden

Table A.2 reports the share of each region in GDP in 2008 collected from Statistics Sweden in column (1), the share of firms across each region in our sample in 2008 in column (2), and the fraction of loan firms in each region in 2009 in column (3).

Region	Share of production	Share of sample	Fraction loan firms
Stockholm	0.295	0.276	0.026
Uppsala	0.032	0.028	0.022
Södermanland	0.023	0.026	0.024
Östergötland	0.039	0.038	0.031
Jönköping	0.033	0.039	0.035
Kronoberg	0.018	0.018	0.043
Kalmar	0.021	0.023	0.027
Gotland	0.004	0.007	0.028
Blekinge	0.014	0.013	0.028
Skåne	0.114	0.127	0.031
Halland	0.027	0.033	0.019
Västra Götaland	0.168	0.170	0.027
Värmland	0.023	0.026	0.034
Örebro	0.026	0.024	0.029
Västmanland	0.023	0.021	0.025
Dalarna	0.026	0.029	0.019
Gävleborg	0.025	0.025	0.028
Västernorrland	0.023	0.022	0.021
Jämtland	0.012	0.014	0.028
Västerbotten	0.024	0.022	0.023
Norrbotten	0.028	0.021	0.016

Table A.3: Sample characteristics across industries in Sweden

Table A.3 reports the share in GDP by each broad industry classification (provided by Statistics Sweden) in 2008 in column (1), the share of firms across each industry in our sample in 2008 in column (2), and the fraction of loan firms in each industry in 2009 in column (3).

Region	**Share of production**	**Share of sample**	**Fraction loan firms**
Agriculture	0.020	0.025	0.008
Communications	0.051	0.062	0.034
Computer services	0.035	0.015	0.015
Construction	0.077	0.122	0.020
Education	0.010	0.015	0.024
Entertainment services	0.008	0.017	0.020
Food and accommodation	0.019	0.055	0.039
Health services	0.025	0.032	0.017
Manufacturing	0.243	0.132	0.053
Mining	0.009	0.002	0.008
Professional business services	0.069	0.169	0.026
Rental and leasing	0.039	0.042	0.032
Retail and wholesale trade	0.136	0.249	0.018
Transportation	0.064	0.063	0.027