

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

James R. Brown (Iowa State University)

Gustav Martinsson (SHoF & KTH)

Christian Thomann (KTH & CESIS)

The policy

- Launched in March 2009 by the Ministry of Finance and ran through 2010.
- It allowed firms to temporarily postpone paying two months' worth of labor taxes.
- Interest rate set at around 5% to appeal only constrained firms.
- Three novel properties of the policy:
 - It is not a grant with an application process
 - It is available to all types of firms (also unprofitable firms)
 - It is temporary

Why is this interesting?

- Ideal setting to setting to study key questions on the consequences of negative financing shocks.
 1. Who is financially constrained?
 - Observe entire economy, not just publicly traded firms
 - Take the loan and increase debt => Financially constrained
 - The loan more useful to some firms than others
 2. Can short-term lending facilities mitigate these constraints?
 - Most gov't programs focus on constraints over the long-run
 - E.g., Bach, 2014; Banerjee and Duflo, 2014; Lelarge et al., 2010
 3. What are the real effects of access to capital in a crisis?
 - Investment and employment growth relative to the counterfactual

Data sources

- Balance sheet and income statement information of all Swedish limited liability corporations 2007-2010
- We consolidate the data in order to be more comparable with other studies and we end up with roughly 140,000 firms per year.
- We match the firm-level data with information (Swedish tax agency) of who took the loan using a unique firm identifier.

	Loan firms	No loan firms
Variable	Mean	Mean
Debt growth	0.025***	0.005
CAPX	0.058***	0.043
Employment growth	0.056***	0.020
Cash flow	0.063	0.121***
Debt	0.599***	0.407
Firm age (log)	2.593	2.605
Cash	0.097	0.294***
Dividend	0.016	0.043***
Sales growth	0.045***	-0.041
Wage bill (log)	15.118***	13.595
Loan capacity	0.086***	0.060
Loan amount	0.069***	0.000
Nr of firms	2,501	138,944

Accessed loan amounts

		Loan amount					
	Nr of Firms	Total loan capacity (MSEK)	Total loan amount (MSEK)	Mean	25 th	Median	75 th
2009	2,133	5,950	4,460	2,062,049	96,329	228,133	578,245
2010	888	3,390	417	447,283	54,139	140,000	333,965

Summary

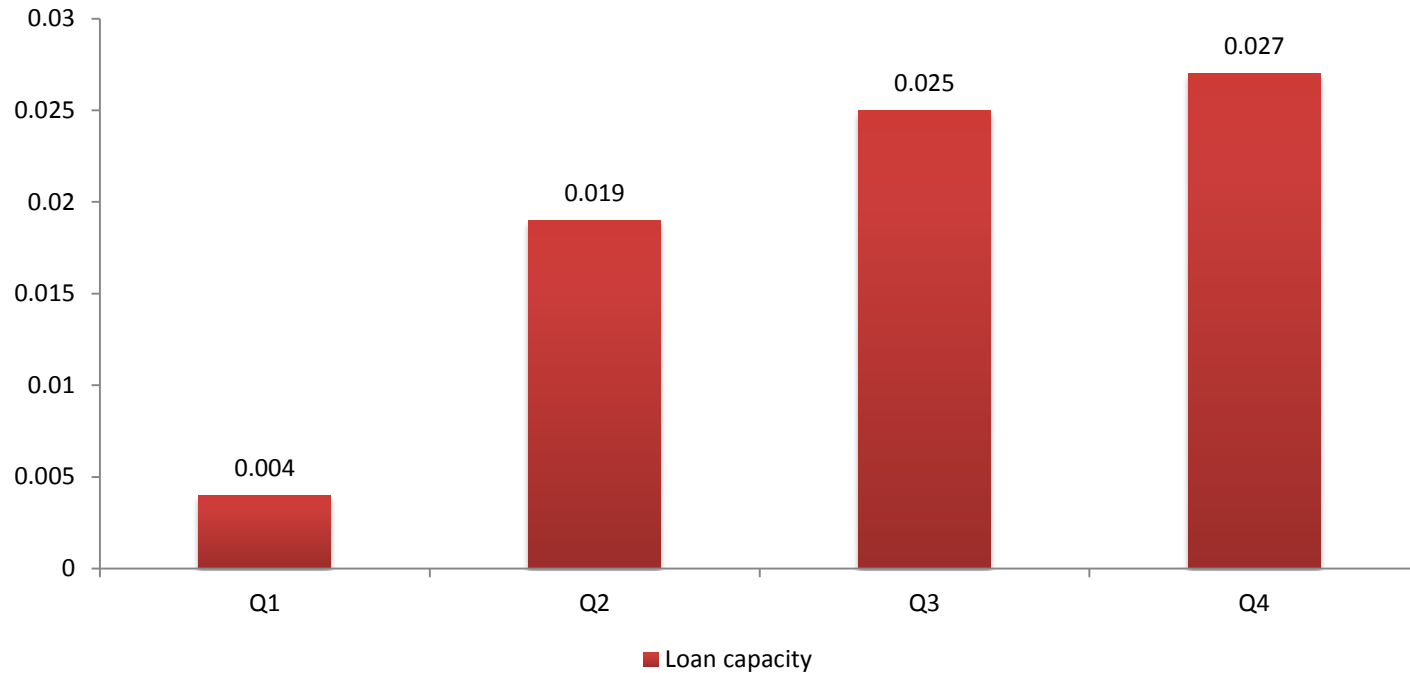
- 2,501 unique firms taking loan.
- A total of 4,88 billion SEK in loans (roughly 640 million USD).
- 2.36 billion to three firms.
- In 2009 the 2,133 firms took 4.47 (75%) out of a possible 5.95 billion in loans.

Loan amount distributed across loan capacity quartiles

<i>Loan capacity quartiles:</i>	All	Q1	Q2	Q3	Q4
	<i>Loan amount</i>				
	(1)	(2)	(3)	(4)	(5)
Mean	0.069	0.026	0.036	0.063	0.170
25 th	0.020	0.009	0.023	0.039	0.076
Median	0.038	0.016	0.034	0.059	0.109
75 th	0.073	0.023	0.043	0.076	0.154

Identification

- The lending facility more useful to some firms than others

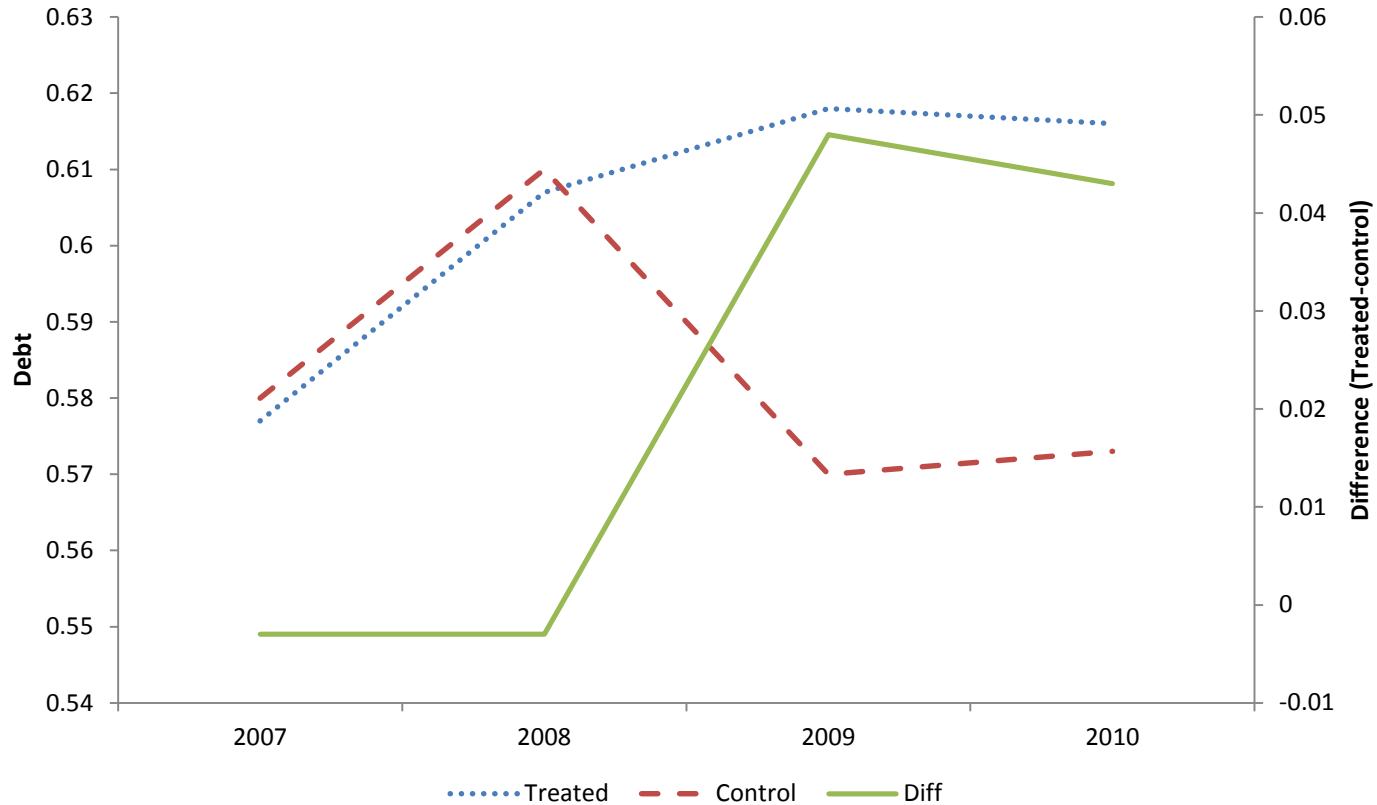


Exact matching before the lending program

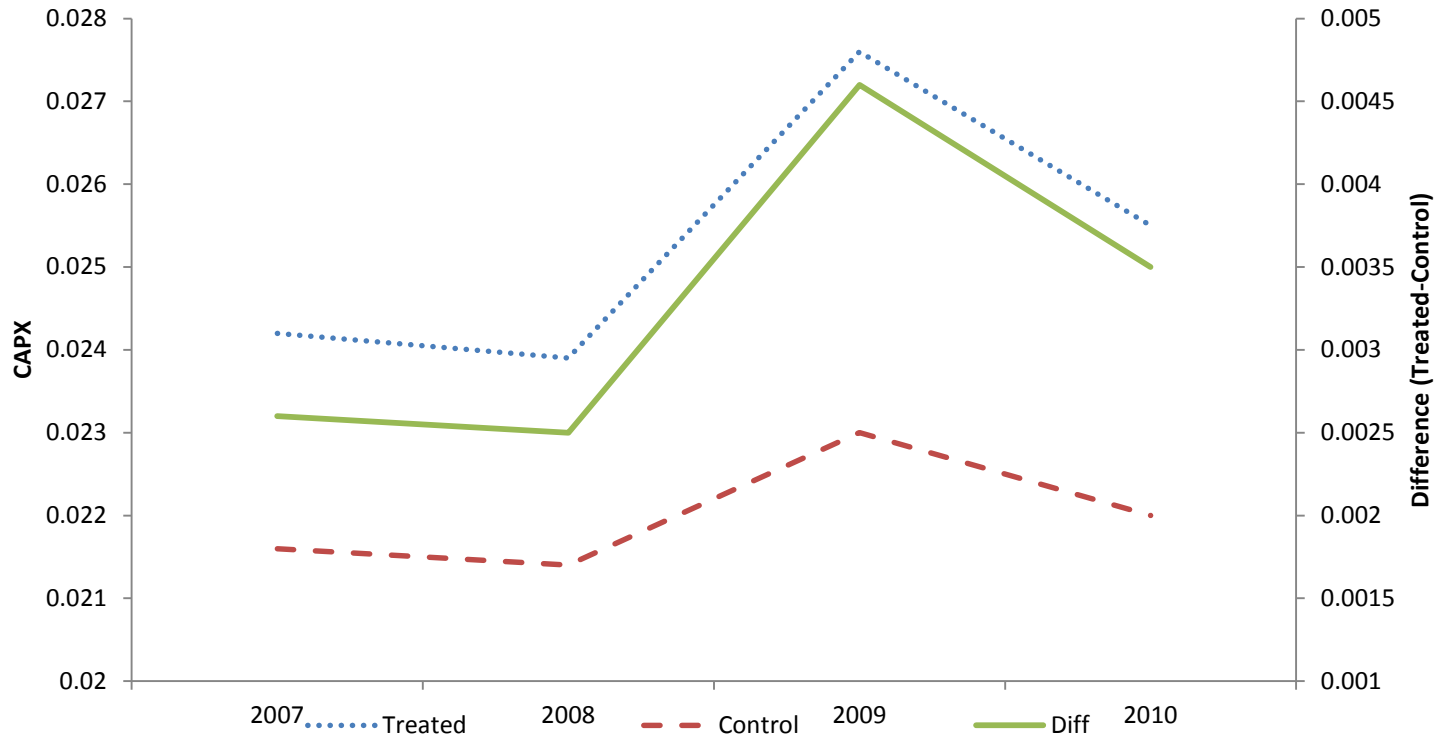
	Loan firms	Control firms	Diff. in means
Variable	Mean	Mean	(p-value)
Cash flow	0.037	0.041	(0.405)
Debt	0.592	0.592	(0.995)
Firm age (log)	2.964	2.949	(0.789)
Cash	0.028	0.036	(0.018)**
Dividend	0.003	0.005	(0.005)***
Sales growth	-0.001	-0.005	(0.729)
Wage bill (log)	14.891	14.792	(0.388)
CAPX	0.024	0.022	(0.308)

Nr of firms	252	311	-
-------------	-----	-----	---

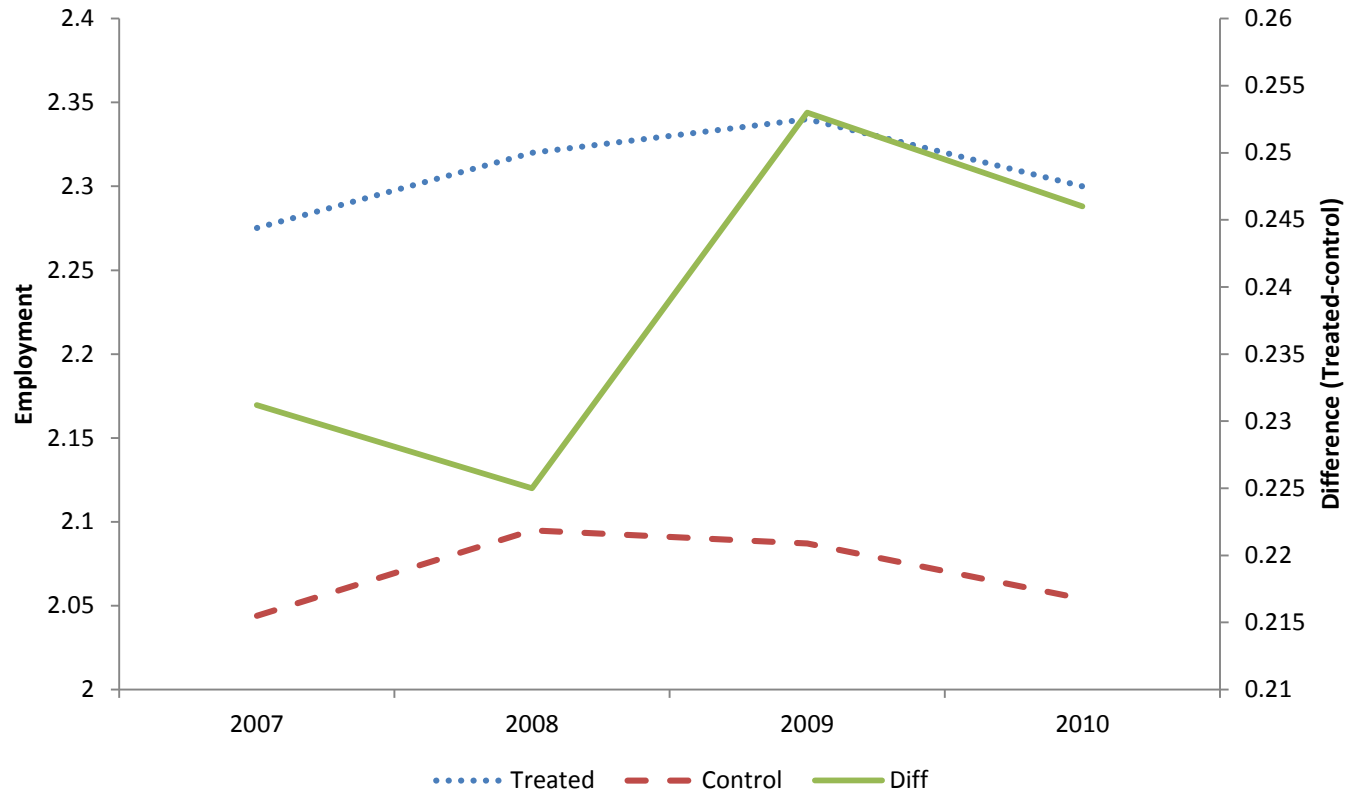
Change in Debt around event



Change in CAPX around event



Change in Employment around event



Identification

- Inspired by Banerjee and Duflo (2014)
- If firm is financially constrained then it increases its debt, i.e., not substituting.
- Debt growth = Intercept + Loan Period + Loan Firm +
Loan Period × Loan Firm

Financing constraints: Debt growth regressions

	(1)	(2)	(3)	(4)	(5)	(6)
	Annual change in debt					
Loan Period × Loan Firm	0.026 (0.004)***	0.026 (0.003)***	0.026 (0.004)***	-	-	0.060 (0.021)***
Loan firm	0.011 (0.002)***	0.028 (0.002)***	-	-	-	0.004 (0.016)
Loan period	-0.030 (0.000)***	-0.023 (0.000)***	-	-0.006 (0.003)**	-0.025 (0.004)***	0.003 (0.010)
Loan amount	-	-	-	0.084 (0.024)***	0.098 (0.024)***	-
Sample	All firms	All firms	All firms	Loan firms	Loan firms	Matched
Firm controls	No	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	No	Yes	No	Yes
Firm fixed effects	No	No	Yes	No	Yes	No
Year fixed effects	No	No	Yes	No	No	No
Observations	551,950	495,760	495,760	9,715	9,715	1,071

Financing constraints: Debt growth regressions

	(1)	(2)	(3)	(4)	(5)	(6)
	Annual change in debt					
Loan Period × Loan Firm	0.026 (0.004)***	0.026 (0.003)***	0.026 (0.004)***	-	-	0.060 (0.021)***
Loan firm	0.011 (0.002)***	0.028 (0.002)***	-	-	-	0.004 (0.016)
Loan period	-0.030 (0.000)***	-0.023 (0.000)***	-	-0.006 (0.003)**	-0.025 (0.004)***	0.003 (0.010)
Loan amount	-	-	-	0.084 (0.024)***	0.098 (0.024)***	-
Sample	All firms	All firms	All firms	Loan firms	Loan firms	Matched
Firm controls	No	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	No	Yes	No	Yes
Firm fixed effects	No	No	Yes	No	Yes	No
Year fixed effects	No	No	Yes	No	No	No
Observations	551,950	495,760	495,760	9,715	9,715	1,071

Financing constraints: Debt growth regressions

	(1)	(2)	(3)	(4)	(5)	(6)
	Annual change in debt					
Loan Period × Loan Firm	0.026 (0.004)***	0.026 (0.003)***	0.026 (0.004)***	-	-	0.060 (0.021)***
Loan firm	0.011 (0.002)***	0.028 (0.002)***	-	-	-	0.004 (0.016)
Loan period	-0.030 (0.000)***	-0.023 (0.000)***	-	-0.006 (0.003)**	-0.025 (0.004)***	0.003 (0.010)
Loan amount	-	-	-	0.084 (0.024)***	0.098 (0.024)***	-
Sample	All firms	All firms	All firms	Loan firms	Loan firms	Matched
Firm controls	No	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	No	Yes	No	Yes
Firm fixed effects	No	No	Yes	No	Yes	No
Year fixed effects	No	No	Yes	No	No	No
Observations	551,950	495,760	495,760	9,715	9,715	1,071

Real outcomes

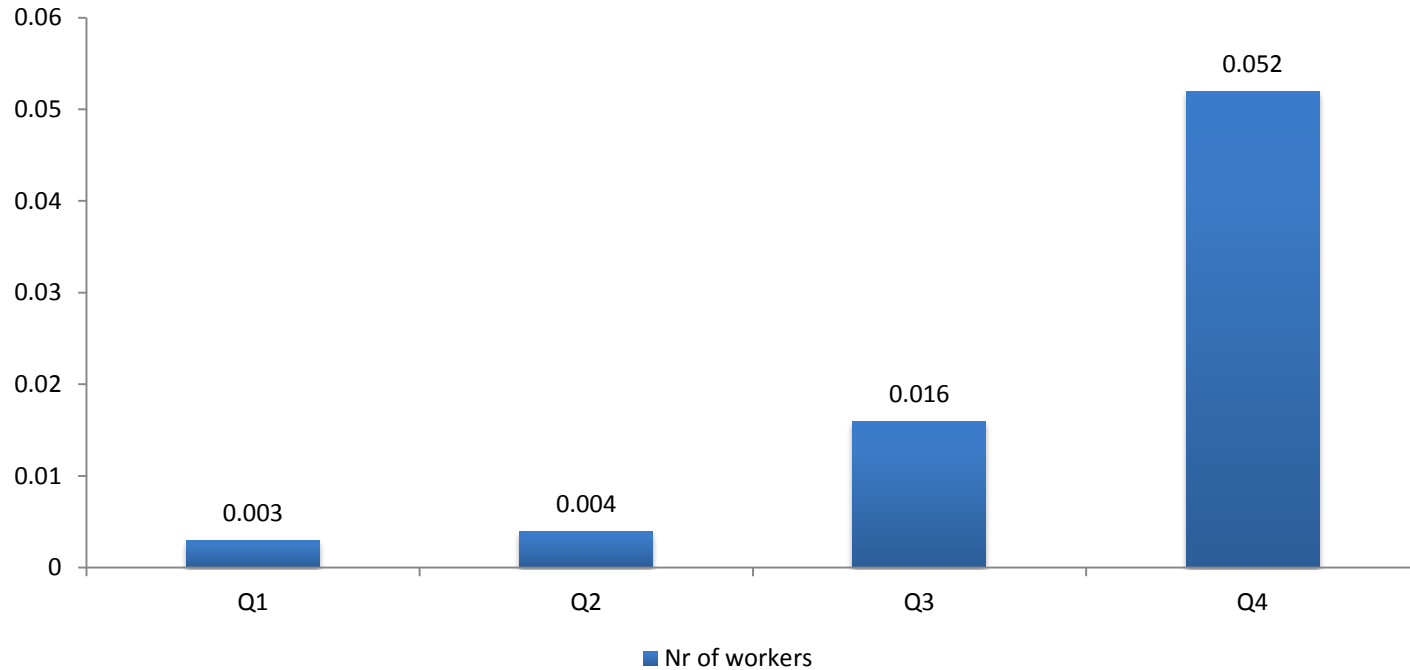
	(1)	(2)	(3)	(4)	(5)	(6)
		CAPX		Changes in Employment		
Loan Period × Loan Firm	0.003 (0.001)***	0.010 (0.003)***	-	0.009 (0.010)	0.074 (0.069)	-
Loan firm	0.002 (0.001)***	0.000 (0.002)	-	0.046 (0.005)***	0.105 (0.057)*	-
Loan period	0.002 (0.000)***	0.001 (0.001)	0.004 (0.001)***	-0.012 (0.001)***	-0.066 (0.034)*	-0.052 (0.013)***
Loan amount	-	-	0.019 (0.005)***	-	-	0.661 (0.327)**
Sample	All firms	Matched	Loan firms	All firms	Matched	Loan firms
Firm controls	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	482,840	1,071	9,390	421,938	1,059	9,306

Real outcomes

	(1)	(2)	(3)	(4)	(5)	(6)
		CAPX		Changes in Employment		
Loan Period × Loan Firm	0.003 (0.001)***	0.010 (0.003)***	-	0.009 (0.010)	0.074 (0.069)	-
Loan firm	0.002 (0.001)***	0.000 (0.002)	-	0.046 (0.005)***	0.105 (0.057)*	-
Loan period	0.002 (0.000)***	0.001 (0.001)	0.004 (0.001)***	-0.012 (0.001)***	-0.066 (0.034)*	-0.052 (0.013)***
Loan amount	-	-	0.019 (0.005)***	-	-	0.661 (0.327)**
Sample	All firms	Matched	Loan firms	All firms	Matched	Loan firms
Firm controls	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	482,840	1,071	9,390	421,938	1,059	9,306

Firm size

- Fraction of loan firms in firm size quartiles



Dropping the smallest firms

	(1)	(2)	(3)	(4)	(5)	(6)
	Changes in Debt		CAPX		Changes in Employment	
Loan Period × Loan Firm	0.021 (0.004)***	-	0.004 (0.001)***	-	0.040 (0.010)***	-
Loan firm	0.026 (0.002)***	-	0.004 (0.001)***	-	0.019 (0.006)***	-
Loan period	-0.009 (0.001)***	-0.003 (0.003)	0.003 (0.000)***	0.005 (0.001)***	-0.003 (0.002)*	-0.056 (0.014)***
Loan amount	-	0.071 (0.012)***	-	0.015 (0.003)***	-	1.133 (0.350)***
Sample	Firms in top quartile in firm size – At least 7 employees					
Firm controls	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	123,753	6,220	121,240	6,058	122,946	6,164

Summary and conclusion

- We study a novel government policy launched in Sweden in 2009 to evaluate the consequences of financing constraints in a crisis.
- We show that:
 - i. The firms that took the loan appear to be financially constrained
 - ii. The lending program mitigated these constraints, and
 - iii. The funds raised by the loan were used for real activity