Firing the Wrong Workers: Financing Constraints and Labor Misallocation

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Financing Constraints and Firm Decisions

- A long standing literature (Corporate finance and Macroeconomics) on financing constraints and investment.
- Financing constraint: limited access to external finance that restricts the funding of profitable investment opportunities.
- Distorts intertemporal decisions such as physical investment
- Other distortions include rejecting profitable projects with returns in the medium-long run and favour projects with early cash flows (used vs. new capital, working capital vs. fixed capital, prices vs. market share…)

Financing Constraints and Employment

- Financing constraints affect employment decisions as well as physical investment decisions.

- Many employment decisions are inter-temporal
  - Train workers in order to increase future productivity
  - Intensity of workers screening and hiring search
  - Promotion policies
  - Wage profiles

- In particular, laying off a worker is as an investment decision:
  Pay an upfront firing cost today to save on future wages

Financing Constraints and Firing

- All firms face a trade-off in choosing which workers to lay off.
  - Fire workers with the lowest current firing cost.
  - Fire workers with low future wage-adjusted productivity.

- Financing constraints distort the trade off: upfront firing costs, more relevant than future expected productivity and wages.

- Misallocation effect, the *wrong workers* are fired

- Implications for:
  - The distribution of current and future worker productivity
  - Job security of long-tenure vs. short tenure workers
  - Skill acquisition, training and incentives

This Paper

- Test whether the decision of which workers to fire (by tenure) is distorted by the presence of financing constraints.

- Theoretical model
  - Severance pay is growing in tenure
  - Worker's productivity starts low and changes over time
  - Financing constraints: More weight given to severance pay and current productivity less weight given to future expected productivity

Intuition of the Model:
Financing Constraints, Tenure and Firing Costs

- Severance pay and other firing costs affect which workers are laid off
- Firing costs are growing in tenure.
- A financially unconstrained firm may be indifferent between firing:
  - A long-tenure worker with low future wage adjusted productivity
  - A short-tenure worker with high future wage adjusted productivity
- Faced with the same decision, a financially constrained firm should prefer to lay off the short-tenure worker
- Financially constrained firms hoard low-severance-pay workers (short-tenure) in good times and fire them more intensely in bad times.

Intuition of the Model:
Financing Constraints and Future Productivity

- Option value of short-tenure workers
  - Some new workers have steeper inter-temporal productivity profiles
  - Wages under-react to productivity fluctuations (Wage compression, specific human capital)

- An unconstrained firm may be indifferent between laying off:
  - A short-tenure worker with current low wage-adjusted productivity but a high expected future wage-adjusted productivity
  - A long-tenure worker with medium-low productivity level

- Faced with the same decision, a financially constrained firm should prefer to lay off the short-tenure worker

Model (1)

Stylised model of a firm with many heterogeneous workers.

Every period each worker produces an output equal to $\frac{A}{n_t^{1-\beta}}\mu$, with $\beta \in (0,1)$.

A is firm-specific productivity; μ worker's specific productivity; n_t is the number of workers

Four key features:

1) Wages are rigid, and do not fully adjust to compensate fluctuations in productivity of workers.
   - For simplicity, assume constant wage *w,* set before μ is know, and therefore equal across all workers.
   - Profits generated by a worker with productivity μ in one period:

$$\frac{A}{n_t^{1-\beta}}\mu - w$$

Model (II)

2) Newly hired workers have upside potential. A "short-tenured" worker:

- Has initial productivity μ^Y, drawn from a uniform distribution $[\mu^L, \mu^H]$
- Has a probability η of becoming "long-tenured".
- Long-tenured the workers draw a new productivity value μ^O from a uniform distribution $[\mu^L, \phi\mu^H]$ where $\phi > 1$

3) Firing costs increase with workers tenure in the firm.

- "low tenured" workers can be fired without cost
- "high tenured" workers: firing cost= $F > 0$

4) Workers are hired by paying a fixed cost v>0

Model (111)

Value function of long-tenured workers:

$$V^O(\mu_t^O) = \left(\frac{A}{n^{1-\beta}}\mu^H - w\right) + \frac{(1-\delta)}{1+r+\lambda}E_t\left[V^O(\mu_{t+1}^O)\right]$$

λ= a wedge which incorporates financial considerations, i.e. it is higher for more financially constrained firms.

Value function of short-tenured workers:

$$V^Y(\mu^Y) = \left(\frac{A}{n^{1-\beta}}\mu^Y - w\right) + \frac{(1-\delta)}{1+r+\lambda}\{\eta E[V^O(\mu^O)] + (1-\eta)V^Y(\mu^Y)\}$$

Once productivities are revealed, the firm fires workers that are below minimum productivities μ_{min}^Y and μ_{min}^O, determined by:

$$V^Y(\mu_{min}^Y) = 0$$

$$V^O(\mu_{min}^O) = -F$$

Model (IV)

Firing decisions in the steady state

Workers are fired when their productivities are below μ_{min}^{Y} and μ_{min}^{O}

μ_{min}^{Y} is lower the larger is the expected productivity gain (larger ϕ) from becoming long-tenured: low profits today BUT some probability to generate high profits in the future.

μ_{min}^{O} is lower the larger are firing costs *F:* low profits today AND in future, but costly to fire.

Key: future expected returns are much larger for the marginal short-term worker than for the marginal long-term worker.

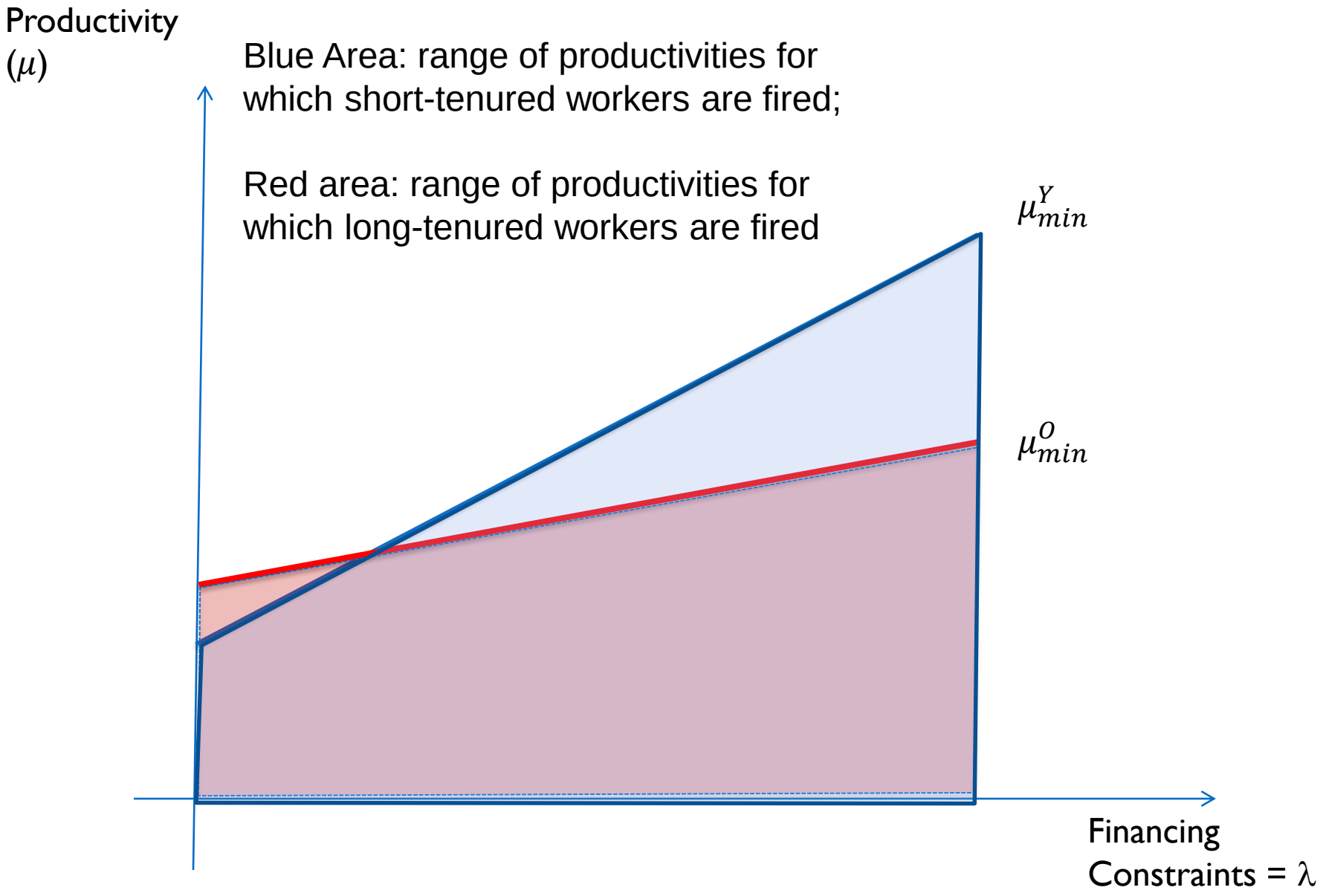
Model (V)

RESULT 1: The more the firm is financially constrained (larger λ), the more it discounts future expected returns, thus increasing relatively more μ_{min}^{Y} than μ_{min}^{O}, and therefore:

The more financially constrained is a firm, the more likely it will fire a short-tenured worker, and the less likely it will fire a high tenured worker, compared to a less financially constrained firm.

RESULT 2: Short-tenured workers are fired more frequently and fewer workers become long tenured:

The more financially constrained is a firm, the higher is the ratio of short-term versus long-term workers


Productivity
(μ)
Blue Area: range of productivities for which short-tenured workers are fired;
Red area: range of productivities for which long-tenured workers are fired
μ^{Y}_{min}
μ^{O}_{min}
Financing Constraints = λ

Model (VI)

A temporary shock reduces *A*. Productivity of all workers $\left(\frac{A}{n_t^{1-\beta}}\mu\right)$ falls.

V^Y and V^O fall, μ_{min}^Y and μ_{min}^O increase, and the firm fires both types of workers.

How do financing frictions affect the tenure mix of fired workers?

RESULT 3: The more the firm is financially constrained:

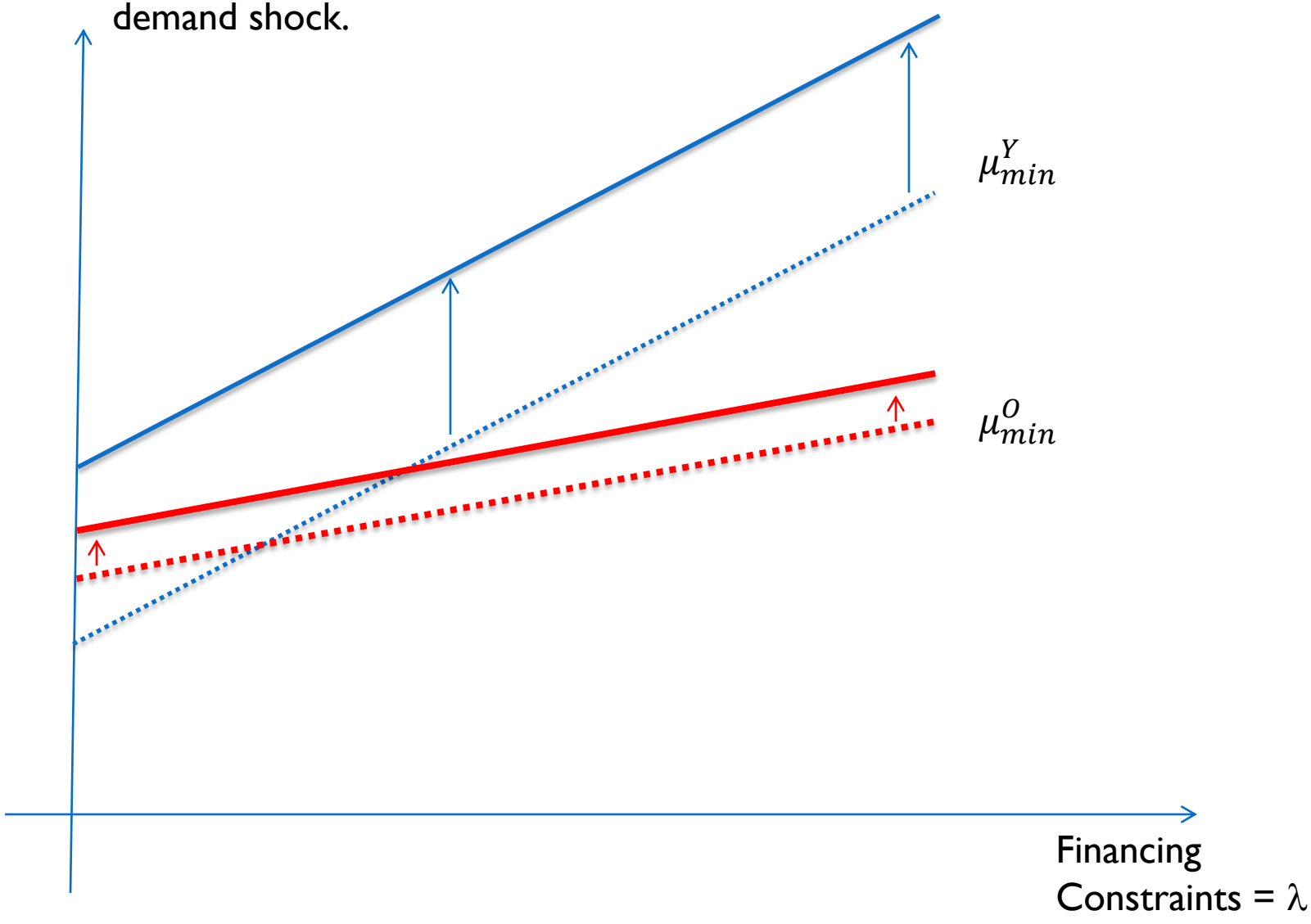
i) The more the value of its low tenured workers is driven by their current profitability $\left(\frac{A}{n^{1-\beta}}\mu^Y - w\right)$ rather than by their option value of becoming more productive in the future

ii) Therefore a temporary drop in A will have a much large negative effect on the value of low tenured workers for the more financially constrained firms.

After an exogenous shock which requires a reduction in employment, a more financially constrained firm will fire workers with relatively shorter tenures than a less financially constrained firm.

Productivity (μ)

Effect of an unexpected temporary demand shock.



This Paper

- Test whether the decision of which workers to fire (by tenure) is distorted by the presence of financing constraints.

- Theoretical model
  - Severance pay is growing in tenure
  - Worker's productivity starts low and changes over time
  - Financing constraints: More weight given to severance pay and current productivity less weight given to future expected productivity
  - Financing constraints create distortions to optimal firing policy
  - Frictions reinforce each other

This Paper

- Test whether the decision of which workers to fire (by tenure) is distorted by the presence of financing constraints.

- Hypotheses
  - Do financially constrained firms fire more short-tenure workers?
  - Do financially constrained firms use more short-tenure workers?
  - Are the effects emphasized in bad times?

- Use matched employer-employee Swedish administrative data.
  - Population of establishments and workers
  - Firms, balance sheet, profit and loss and financing constraints.

This Paper

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- Hypotheses
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- Use matched employer-employee Swedish administrative data.

- Identification strategy: financing constraints
  - Regression discontinuity design (RDD) on discrete ratings
  - Within firm-year estimators

- Identification strategy: negative shocks
  - Firm-specific exchange rate shocks – (Exports)

Preview of Results…

- Financially constrained firms (one rating worse) tend to hoard short-tenure workers in good times and fire more of them in bad times
- Relative to a unconstrained firm, constrained firms have a 15% higher likelihood of firing a short-tenure worker and a 17% lower likelihood of firing a long-tenure worker in normal times, .
- The effect is emphasized in bad times (28% and -18%)
- A higher fraction of labour force flexibility is absorbed by short-tenure workers in financially constrained firms (last in first out)
- Long-tenure workers in constrained firms are *protected* by a buffer of short-tenure workers that are fired first in bad times

DATA

- LISA data from Statistics Sweden (SCB)
  - Population, employer-employee matched data, 1990-2011
    - **Low tenured worker** = 0-2 years of tenure with employer
    - **Fired** - No job / different employer **AND** Unemployment benefits
- Firm data
  - PAR Serrano, 1997 – 2011; balance sheet and income statement for all limited liability companies
- Export shocks
  - Appreciation of export weighted firm-specific exchange rate

Data: Export shocks

- Main idea: Firms are asymmetrically hit by exchange rate fluctuations
  - Construct firm-specific currency weights by exports at t=0
  - Construct firm-specific exchange rate
    - $Exchange\ rate_{f,t} = \sum_c \omega_{f,c,0} * e\_change_{c,t}$
    - e_change is the changes of the exchange rates over the last year
  - FX shocks
    - Negative export shock - Appreciation:
      - Bottom 20% quantile within a year AND bottom half of all years

DATA: Summary Statistics - Firms

Panel A: Firm Characteristics

	Mean	p25	p50	p75	N
Assets (log)	16.79	15.75	16.56	17.57	129193
Firm age	12.6	10	13	16	129206
Workforce	72.1	9	17	40	129206
Workforce growth	0.009	-0.083	0	0.100	129206
Fired Tenure 0-2 years / Fired Total	0.67	0.50	0.83	1	65245
Fraction of workers with tenure 0-2 years	0.33	0.18	0.30	0.46	129206
FX Shock	0.11	0	0	0	129206
Rating	1.96	1	2	3	129206
Rating 1 vs. 2	0.44	0	0	1	85515
Rating 2 vs. 3	0.53	0	1	1	81392

DATA: Summary Statistics - Workers

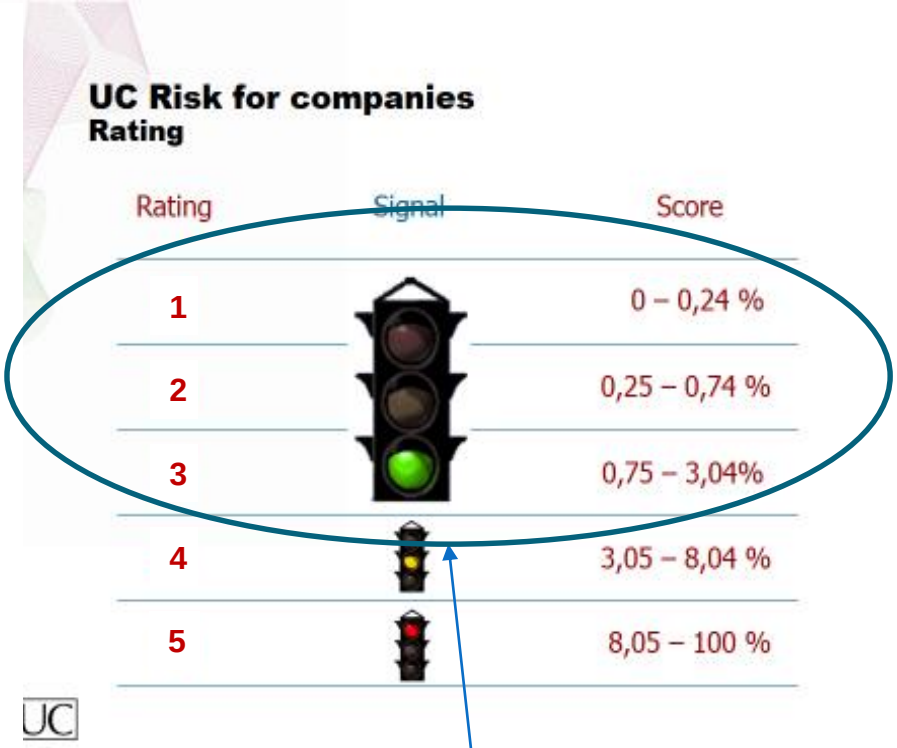
Panel B: Worker Characteristics

	mean	p25	p50	p75	N
Age	39	29	38	48	7130309
Female	0.33	0	0	1	7130309
Tenure (years)	3.5	1	3	6	7130309
Prob. of being fired (Annual)	0.063				7130309
Prob. of being fired | Short-tenure	0.104				3256913
Prob. of being fired | Long-tenure	0.029				3873396

Measuring Financing Constraints

The UC credit report

- Leading credit bureau in Sweden, covers all the firms.
- Used by Bank of Sweden for the risk assessment of bank's portfolios
- Access restricted to subscribers: Different reports contain different information (e.g. supplier report only contains rating)
- Rating is a discrete transformation of a continuous credit score (annual default probability)
- Continuous credit score is based on a formula, score reviewed at least annually, no discretion



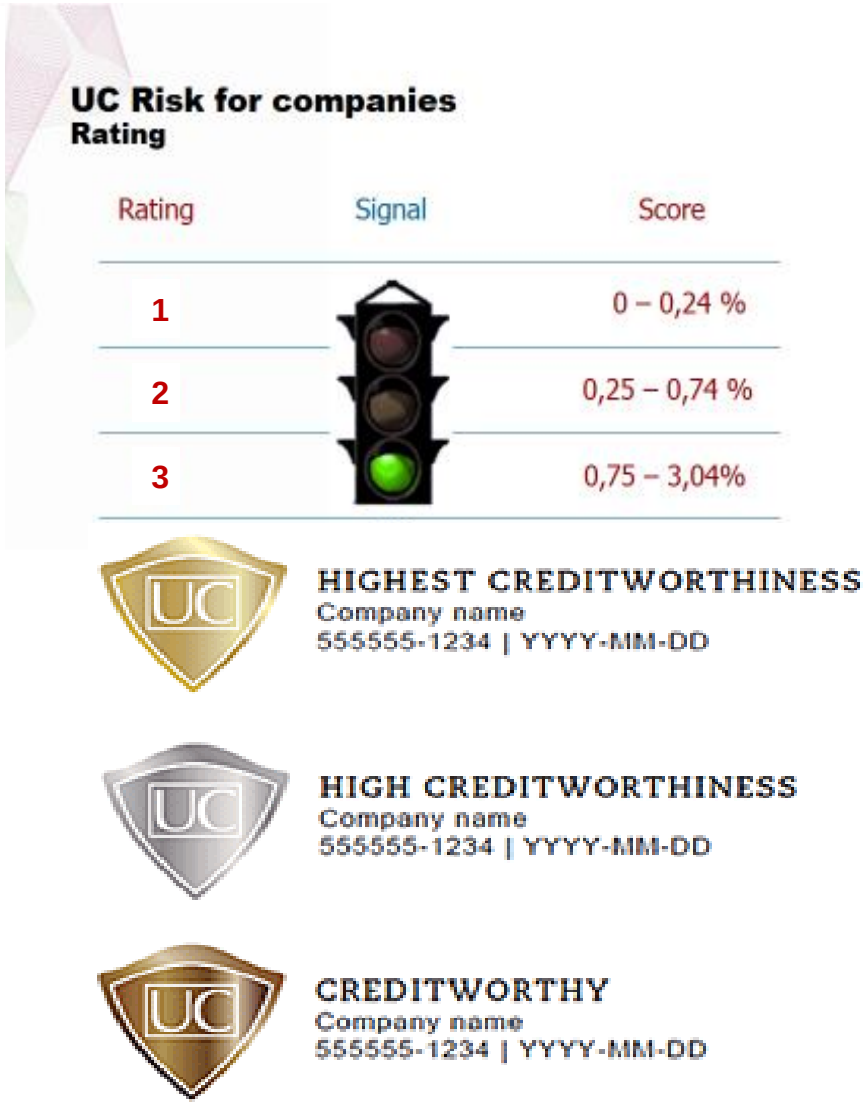
We focus on the first three ratings

- Financially healthy firms
- Not financially distressed

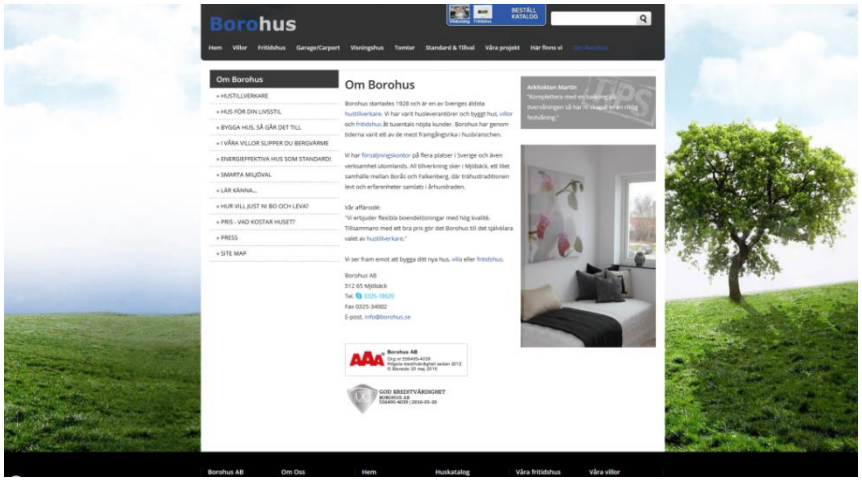
Measuring Financing Constraints

We focus on the top 3 ratings

- Firms can request a certification of their rating (1 = gold, 2 = silver and 3 = bronze)
- Physical and secured online certificate.
- Coarse measures of financial health. Observed by all. (suppliers, customers, workers, small lenders…)
- Implicit changes in interest rates
  - Average –
    14bp Gold-Silver, 28bp Silver-Bronze
  - Marginal –
    16bp Gold-Silver, 54bp Silver-Bronze



Measuring Credit Constraints



HIGHEST CREDITWORTHINESS
Company name
555555-1234 | YYYY-MM-DD

HIGH CREDITWORTHINESS
Company name
555555-1234 | YYYY-MM-DD

CREDITWORTHY
Company name
555555-1234 | YYYY-MM-DD

Estimation strategy: Financing Constraints

- *Specification 1: Discrete Ratings*

First three tiers of the credit rating (constrained=higher rating) $-\ C_{ft}$

Firm fixed effects, Sector-year fixed effects

Firm-level regression

$$y_{ft} = \alpha + \beta_1 Shock_{ft-1} + \beta_2 C_{ft} + \beta_3 (C_{ft} * Shock_{ft-1}) + \lambda_f + \delta_{st} + \varepsilon_{ft}$$

Worker-level regressions (interact with tenure)

$$y_{it} = \alpha + \beta_{1j} Shock_{fjt-1} + \beta_{2j} C_{fjt} + \beta_{3j} (C_{fjt} * Shock_{fjt-1}) + \lambda_f + \delta_{st} + \varepsilon_{ft}$$

$j \epsilon \{long\ tenure, short\ tenure\}$

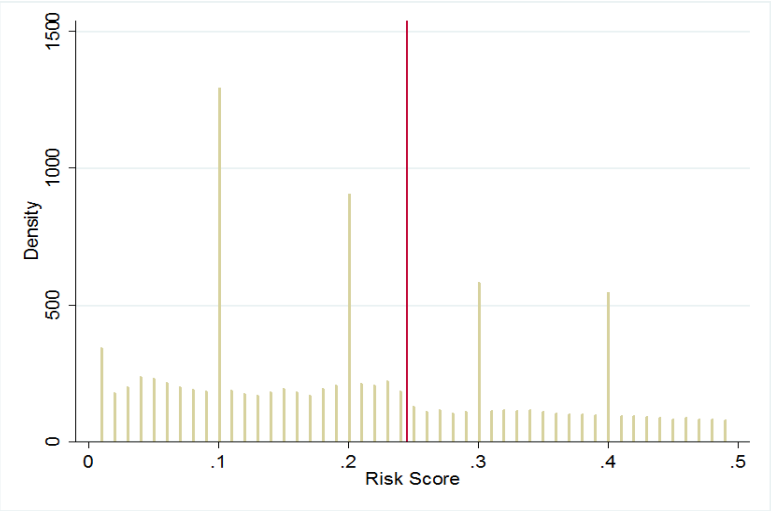
Equilibrium correlations between financing constraints and firing.
Isolate effect of Shocks (IV) with full control on Financing Constraints

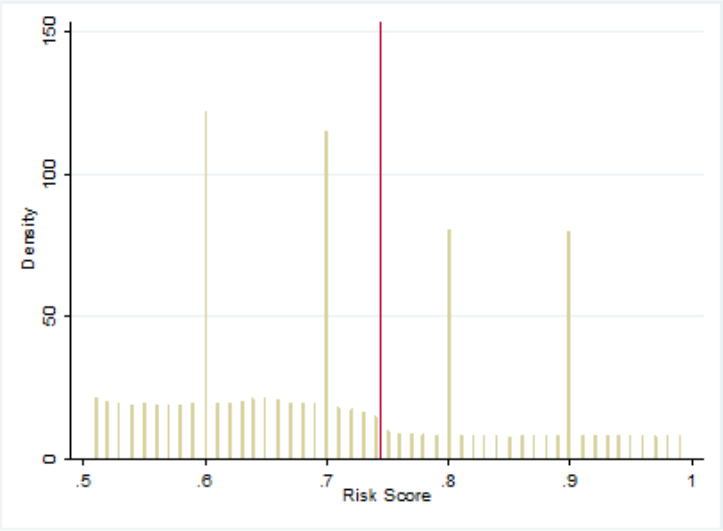
Financing constraints: RDD

- Specification 2: Regression Discontinuity Design.
- Discrete ratings are determined by underlying default probability
  - 1: p < 0.245%, 2: p<0.745%, 3: p<3.045%,
  - Compare firms that are close to these boundaries but on different sides → RDD (multi-threshold)
- No manipulation at the threshold, underlying model not exactly known by firms. High Volatility of Inter Annual Credit Score.

Rating	1-2	2-3	3-4
Threshold	0.245	0.745	3.045
Annual absolute deviation (5% neighbourhood)			
Mean	0.15	0.43	1.7
Median	0.36	0.91	2.619

Financing constraints: RDD





		This year's rating		
		Gold	Silver	Bronze
Last year's rating	Gold	78%	18%	4%
	Silver	28%	54%	18%
	Bronze	8%	36%	56%

Estimation strategy: Financing Constraints

- *Specification 2: Regression Discontinuity Design*

Ratings measure but also cause constraints

Add polynomials (order 12) on continuous credit score (by tenure j)

Firm level regressions

$$y_{ft} = \beta_1 \text{Shock}_{ft-1} + \beta_2 C_{ft} + \beta_3 (C_{ft} * \text{Shock}_{ft-1}) + P(risk) + \lambda_f + \delta_{st} + \varepsilon_{ft}$$

Worker-level regressions

$$y_{it} = \alpha + \beta_{1j} \text{Shock}_{fjt-1} + \beta_{2j} C_{fjt} + \beta_{3j} (C_{fjt} * \text{Shock}_{fjt-1}) + P_j(risk) + \lambda_f + \delta_{st} + \varepsilon_{ft}$$

Two different polynomials for high and low tenure workers

Causal approach – Boundary firms as good as random allocation

Estimation strategy: Financing Constraints

- *Specification 3: Within Firm Estimator*

Worker level regressions: Include firm-year dummies.

$$y_{it} = \alpha + \beta_{1j}\text{Shock}_{ft-1} + \beta_{2j}C_{ft} + \beta_3(C_{fjt} * \text{Shock}_{ft-1}) + \mu_{ft} + \varepsilon_{ft}$$

Take out any additive factors that affect both high and short-tenure workers within the firm

Nested with an RDD specification with time-varying common polynomials for high and short tenure workers.

Identify on high and low tenure workers within firm, across ratings
Some RDD approaches (common polynomial, by year, by sector…) nested.

Results: Firm Level

	Fraction of workers with tenure 0-2 years					
	(1)	(2)	(3)	(4)	(5)	(6)
Negative export shock				0.017***	0.008**	0.008**
				(0.004)	(0.004)	(0.004)
Constrained	0.046***	0.014***	-0.004*	0.047***	0.014***	-0.003
	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.002)
Negative export shock X Constrained				-0.014***	-0.006***	-0.006***
				(0.002)	(0.002)	(0.002)
Observations	129029	129029	129029	129029	129029	129029
Polynomial on Credit Risk	No	No	Yes	No	No	Yes
Industry-Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Firm fixed effects	No	Yes	Yes	No	Yes	Yes

Results: Worker Level

	Fired Next Year					
	(1)	(2)	(3)	(4)	(5)	(6)
Short-tenure	0.060***	0.074***	0.066***	0.064***	0.057***	0.070***
	(0.000)	(0.001)	(0.000)	(0.000)	(0.007)	(0.001)
Negative Export Shock				0.009***	0.002***	-
				(0.001)	(0.001)	-
Short-tenure X Neg. Shock				-0.024***	-0.031***	-0.024***
				(0.001)	(0.001)	(0.001)
Rating	-0.003***	0.001***	-	-0.002***	-0.005*	-
	(0.000)	(0.000)	-	(0.000)	(0.002)	-
Short-tenure X Rating	0.007***	0.002***	0.007***	0.006***	0.016***	0.006***
	(0.000)	(0.001)	(0.000)	(0.000)	(0.003)	(0.000)
Neg Shock X Rating				-0.002***	-0.000	-
				(0.000)	(0.000)	-
Short-tenure X Neg. Shock =1 X Rating				0.006***	0.007***	0.006***
				(0.001)	(0.001)	(0.001)
Observations	7123973	7123973	7123973	7123973	7123973	7123973
Polynomials	No	Yes	No	No	Yes	No
Industry-Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Firm fixed effects	Firm	Firm	Firm-Year	Firm	Firm	Firm-Year

Results: Fraction of Firing

	Firing rate - regular	Firing rate - shock	% of workers	Fraction of firing - regular	Fraction of firing - shock
GOLD					
Short-tenure	9.3%	6.4%	29%	53%	42%
Long-tenure	3.6%	3.8%	68%	47%	58%
SILVER					
Short-tenure	10.4%	8.2%	34%	63%	56%
Long-tenure	3.1%	3.3%	66%	37%	44%
BRONZE					
Short-tenure	12.0%	10.5%	39%	73%	69%
Long-tenure	2.6%	2.8%	65%	27%	31%

Results: Robustness Checks

Heterogeneous effect across rating boundaries

- Individual regressions for each rating boundary
  - Gold-Silver: Larger and more significant effects (dynamics?)
  - Silver-Bronze: Consistent results, slightly smaller.

Use only relative shocks within a year

- Use relative shocks only (20% appreciation within the year)
  - *Smaller Effects*

Focus on surprised firms. Minimize chances of rating manipulation.

- Condition on previously "gold" firms. or "gold" two years in a row
  - Robust results, larger effects.

Results: Worker Level (1 – 2)

	Fired Next Year			
	(1)	(2)	(3)	(4)
Short-tenure	0.070***	0.069***	0.064***	0.054***
	(0.000)	(0.000)	(0.002)	(0.003)
Shock (large)	0.002***	0.007***	0.007***	-
	(0.000)	(0.000)	(0.000)	-
Short-tenure X Shock (large)	-0.025***	-0.020***	-0.020***	-0.018***
	(0.001)	(0.001)	(0.001)	(0.001)
Rating 1 vs. 2	0.009***	-0.006***	-0.009***	-
	(0.000)	(0.000)	(0.002)	-
Short-tenure X Rating 1 vs. 2	0.017***	0.014***	0.021***	0.029***
	(0.001)	(0.001)	(0.003)	(0.004)
Shock (large)=1 X Rating 1 vs. 2	-0.005***	-0.001	-0.001	-
	(0.001)	(0.001)	(0.001)	-
Short-tenure X Shock (large)=1 X Rating 1 vs. 2	0.015***	0.013***	0.013***	0.006***
	(0.001)	(0.001)	(0.001)	(0.002)
Observations	5342003	5342004	5342005	5342006
Polynomials	No	No	Yes	No
Industry-Year fixed effects	Yes	Yes	Yes	Yes
Firm fixed effects	No	Firm	Firm	Firm-Year

Results: Worker Level (2 –3)

	Fired Next Year			
	(1)	(2)	(3)	(4)
Short-tenure	0.087***	0.084***	0.315***	0.277***
	(0.000)	(0.001)	(0.046)	(0.052)
Shock (large)	-0.004***	0.004***	0.004***	-
	(0.001)	(0.001)	(0.001)	-
Short-tenure X Shock (large)	-0.010***	-0.008***	-0.008***	-0.012***
	(0.001)	(0.001)	(0.001)	(0.001)
Rating 2 vs. 3	0.004***	0.002***	-0.001	-
	(0.000)	(0.000)	(0.001)	-
Short-tenure X Rating 2 vs. 3	-0.003***	-0.004***	-0.003	-0.002
	(0.001)	(0.001)	(0.002)	(0.002)
Shock (large)=1 X Rating 2 vs. 3	0.007***	-0.003**	-0.003**	-
	(0.001)	(0.001)	(0.001)	-
Short-tenure X Shock (large)=1 X Rating 2 vs. 3	-0.004**	0.003	0.003*	0.006***
	(0.002)	(0.002)	(0.002)	(0.002)
Observations	3178299	3178300	3178301	3178302
Polynomials	No	No	Yes	No
Industry-Year fixed effects	Yes	Yes	Yes	Yes
Firm fixed effects	No	Firm	Firm	Firm-Year

Results: Worker Level (Within Year Shock)

	Fired Next Year			
	(1)	(2)	(3)	(4)
Short-tenure	0.066***	0.066***	0.082***	0.087***
	(0.000)	(0.001)	(0.002)	(0.002)
Shock (small)	0.002***	0.010***	0.009***	-
	(0.000)	(0.001)	(0.001)	-
Short-tenure X Shock (large)	-0.027***	-0.022***	-0.022***	-0.021***
	(0.001)	(0.001)	(0.001)	(0.001)
Rating	0.007***	-0.002***	0.002***	-
	(0.000)	(0.000)	(0.001)	-
Short-tenure X Rating	0.007***	0.005***	0.000	-0.002
	(0.000)	(0.000)	(0.001)	(0.001)
Shock (large)=1 X Rating	-0.001***	-0.003***	-0.003***	-
	(0.000)	(0.000)	(0.000)	-
Short-tenure X Shock (small)=1 X Rating	0.005***	0.005***	0.005***	0.005***
	(0.001)	(0.001)	(0.001)	(0.001)
Observations	7123973	7123973	7123973	7123973
Polynomials	No	No	Yes	No
Industry-Year fixed effects	Yes	Yes	Yes	Yes
Firm fixed effects	No	Firm	Firm	Firm-Year

Results: Worker Level (Previous Gold)

	Fired Next Year			
	(1)	(2)	(3)	(4)
Short-tenure	0.070***	0.069***	0.097***	0.073***
	(0.001)	(0.001)	(0.003)	(0.001)
Shock (large)	0.009***	0.022***	0.022***	-
	(0.001)	(0.002)	(0.002)	-
Short-tenure X Shock (large)	-0.058***	-0.046***	-0.044***	-0.033***
	(0.002)	(0.003)	(0.003)	(0.003)
Rating 1 vs. 2	0.006***	0.002***	0.011***	-
	(0.000)	(0.001)	(0.002)	-
Short-tenure X Rating 1 vs. 2	-0.002**	-0.000	-0.007***	-0.002**
	(0.001)	(0.001)	(0.003)	(0.001)
Shock (large)=1 X Rating 1 vs. 2	-0.007***	-0.012***	-0.013***	-
	(0.001)	(0.001)	(0.001)	-
Short-tenure X Shock (large)=1 X Rating 1 vs. 2	0.026***	0.021***	0.019***	0.013***
	(0.002)	(0.002)	(0.002)	(0.002)
Observations	2611297	2611297	2611297	2611298
Polynomials	No	No	Yes	No
Industry-Year fixed effects	Yes	Yes	Yes	Yes
Firm fixed effects	No	Firm	Firm	Firm-Year

Conclusions

- Evidence on financing constraints altering the firing policies of firms.
- The trade off between firing costs and future productivity is distorted. *More weight given to firing costs and current productivity*
- Financing constraints reinforce the distortions of firing costs and productivity dynamics
- In financially constrained firms, newer workers are more exposed to firing than in unconstrained ones. Conversely, older workers are relatively safer.

Conclusions (II)

- Novel measure of financing constraints
  - Multiple-threshold RDD *ceteris-paribus* approach.
  - Within-firm estimator

- Labor markets are a good setting to test financing constraints. Lower measurement error and better established benchmarks.

- Swedish labour markets and financial sector are very efficient and developed. Results may be a lower bound for other settings.

Extensions

Direct Measures of Misallocation

- Information contained in wage equations
  - Worker fixed effect as a proxy of skill
- Robustness to alternative definitions of the trade-off (skills)
  - Future salary of fired workers
  - Cognitive and Non-cognitive skills, Leadership, School grades.

Financial Distress

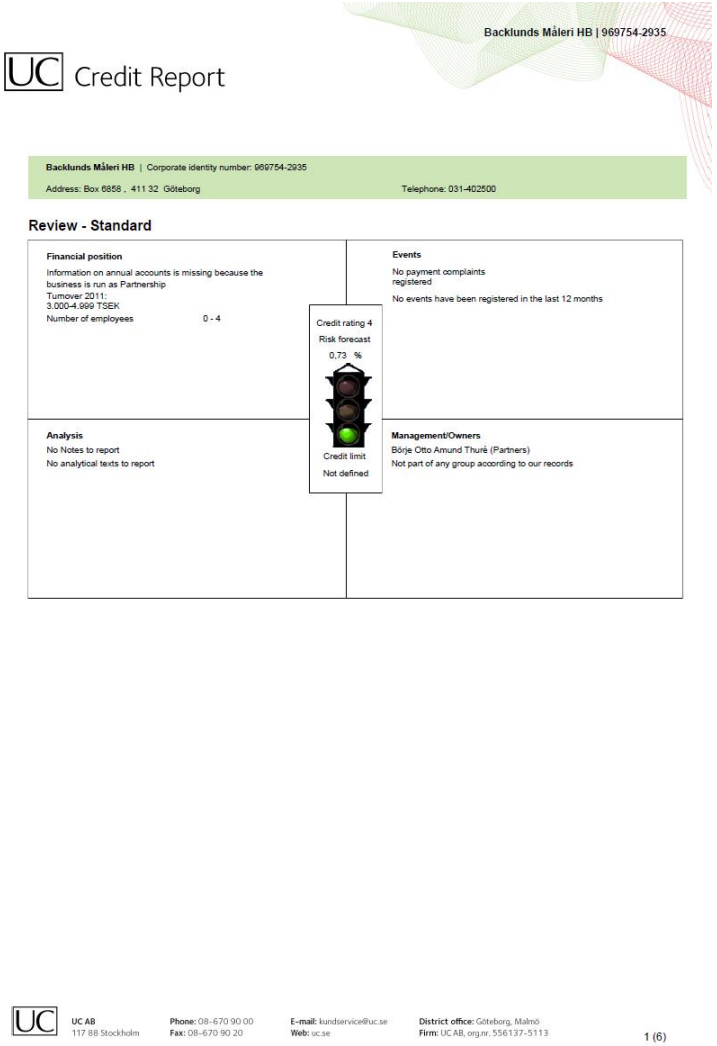
- Explore the lower boundaries (e.g. 3-4) – How do predictions change when firms can be distressed?

Thanks!

ADDITIONAL SLIDES

VOY POR AQUI

Measuring Credit Constraints



Backlunds Måleri HB | 969754-2935

UC Credit Report

Backlunds Måleri HB | Corporate identity number: 969754-2935

Address: Box 6858 , 411 32 Göteborg Telephone: 031-402500

Review - Standard

Financial position

Information on annual accounts is missing because the business is run as Partnership
Turnover 2011:
3.000-4.999 TSEK
Number of employees 0 - 4

Events

No payment complaints registered

No events have been registered in the last 12 months

Credit rating 4
Risk forecast
0,73 %

Credit limit
Not defined

Analysis

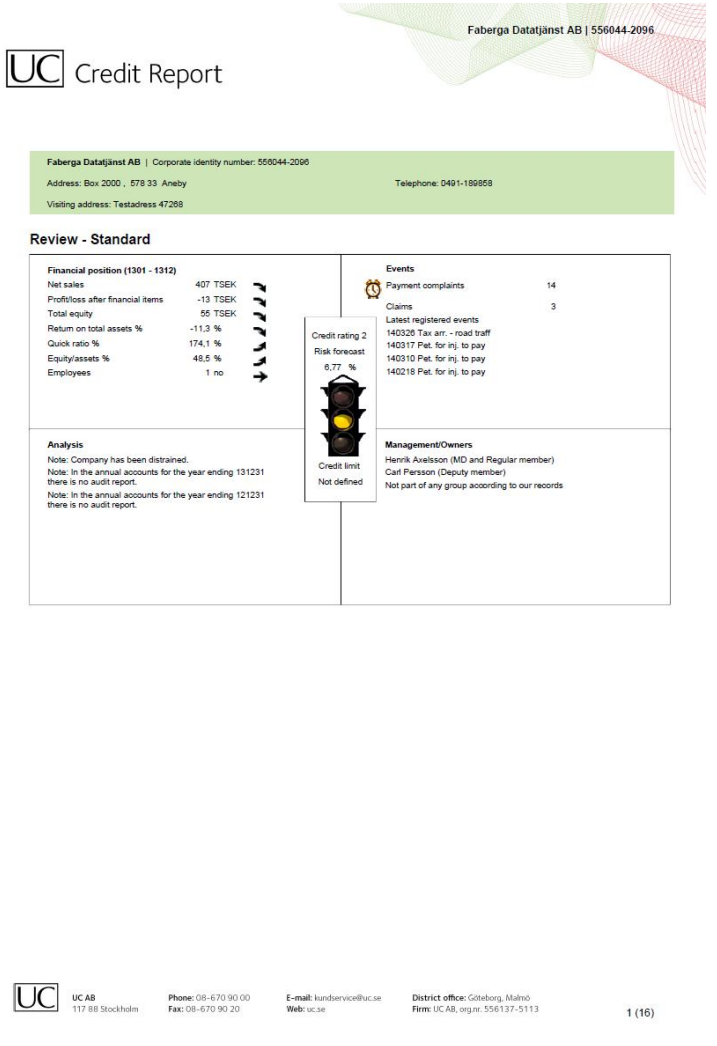
No Notes to report
No analytical texts to report

Management/Owners

Börje Otto Amund Thuré (Partners)
Not part of any group according to our records

UC AB 117 88 Stockholm Phone: 08-670 90 00 Fax: 08-670 90 20 E-mail: kundservice@uc.se Web: uc.se District office: Göteborg, Malmö Firm: UC AB, org.nr. 556137-5113

1 (6)



Faberga Datatjänst AB | 556044-2096

UC Credit Report

Faberga Datatjänst AB | Corporate identity number: 556044-2096

Address: Box 2000 , 578 33 Aneby Telephone: 0491-189858

Visiting address: Testadress 47268

Review - Standard

Financial position (1301 - 1312)

Net sales	407 TSEK
Profit/loss after financial items	-13 TSEK
Total equity	55 TSEK
Return on total assets %	-11,3 %
Quick ratio %	174,1 %
Equity/assets %	48,5 %
Employees	1 no

Events

Payment complaints 14

Claims 3

Latest registered events
140326 Tax arr. - road traff
140317 Pet. for inj. to pay
140310 Pet. for inj. to pay
140218 Pet. for inj. to pay

Credit rating 2
Risk forecast
6,77 %

Credit limit
Not defined

Analysis

Note: Company has been distrained.
Note: In the annual accounts for the year ending 131231 there is no audit report.
Note: In the annual accounts for the year ending 121231 there is no audit report.

Management/Owners

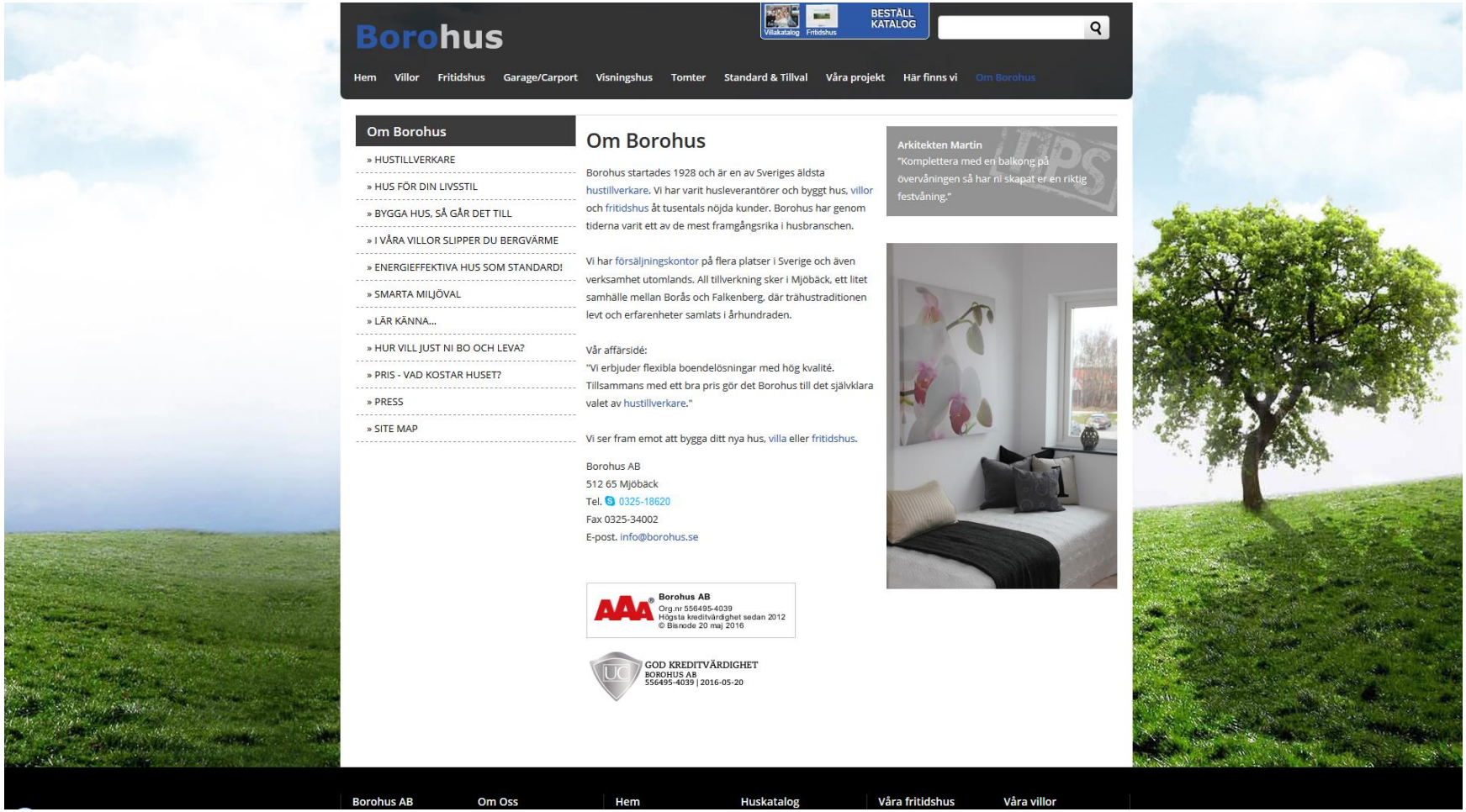
Henrik Axelsson (MD and Regular member)
Carl Persson (Deputy member)
Not part of any group according to our records

UC AB 117 88 Stockholm Phone: 08-670 90 00 Fax: 08-670 90 20 E-mail: kundservice@uc.se Web: uc.se District office: Göteborg, Malmö Firm: UC AB, org.nr. 556137-5113

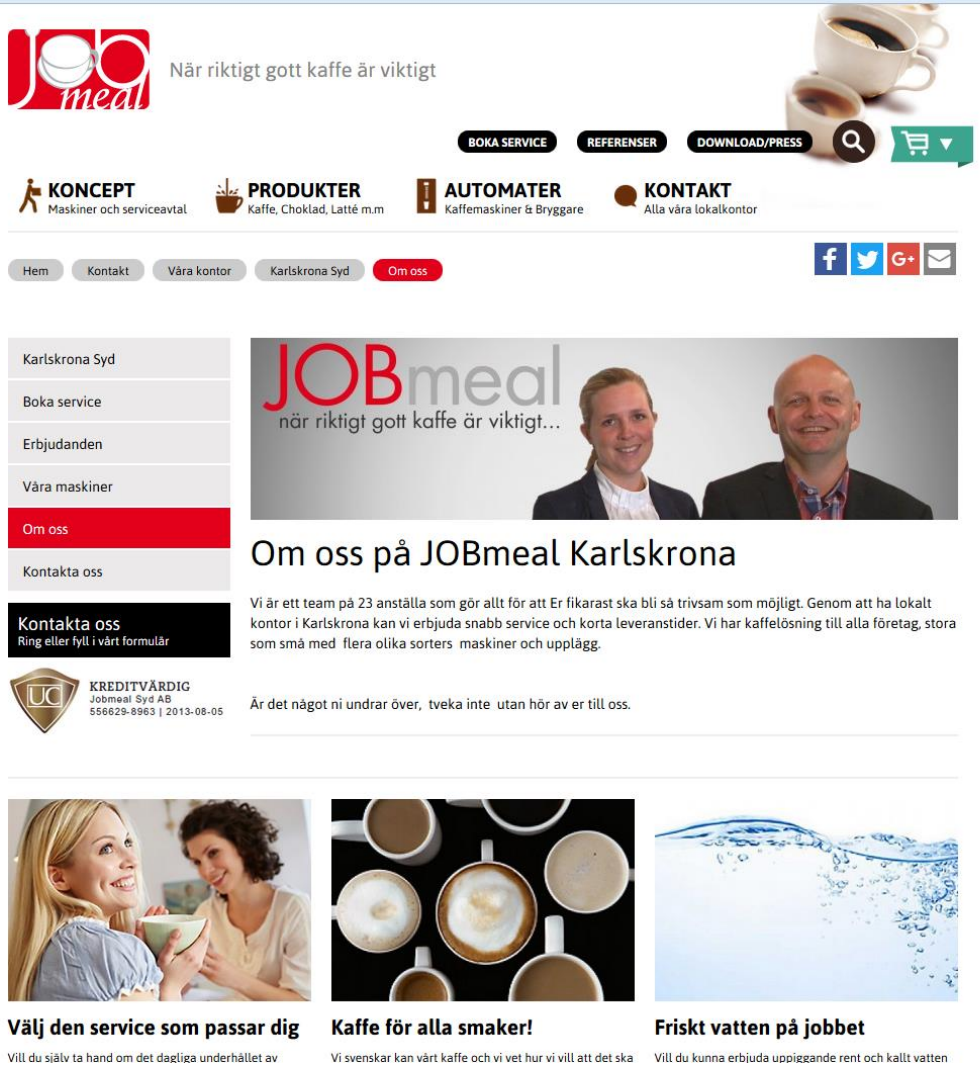
1 (16)

Measuring Credit Constraints

Measuring Credit Constraints



Measuring Credit Constraints



Results: Firm Level

	Fraction of workers with tenure 0-2 years		
	(1)	(2)	(3)
Negative export shock	0.017***	0.008**	0.008**
	(0.004)	(0.004)	(0.004)
Constrained	0.047***	0.014***	-0.003
	(0.001)	(0.001)	(0.002)
Negative export shock X Constrained	-0.014***	-0.006***	-0.006***
	(0.002)	(0.002)	(0.002)
Observations	129029	129029	129029
Polynomial on Credit Risk	No	No	Yes
Industry-Year fixed effects	Yes	Yes	Yes
Firm fixed effects	No	Yes	Yes

Results: Firm Level

	Fraction of workers with tenure 0-2 years			log employment
	(1)	(2)	(3)	(4)
Negative export shock	0.017***	0.018***	0.008**	-0.006
	(0.004)	(0.004)	(0.004)	(0.007)
Constrained	0.047***	-0.004	-0.003	-0.008**
	(0.001)	(0.003)	(0.002)	(0.004)
Negative export shock X Constrained	-0.014***	-0.014***	-0.006***	0.001
	(0.002)	(0.002)	(0.002)	(0.003)
Observations	129029	129029	129029	129029
Polynomial on Credit Risk	No	Yes	Yes	Yes
Industry-Year fixed effects	Yes	Yes	Yes	Yes
Firm fixed effects	No	No	Yes	Yes

Model (1)

Stylised model of a firm with many heterogeneous workers.

Every period each worker produces an output equal to $\frac{A}{n_t^{1-\beta}}\mu$, with $\beta \in (0,1)$.

A is firm-specific productivity; μ worker's specific productivity; n_t is the number of workers

Three key features:

1) Wages are rigid, and do not fully adjust to compensate fluctuations in productivity of workers.

- For simplicity, we assume constant wage *w,* set before μ is know, and therefore equal across all workers.
- Profits generated by a worker with productivity μ in one period:

$$\frac{A}{n_t^{1-\beta}}\mu - w$$

Model (II)

2) Recently hired workers have more upside potential than long-tenured workers. A newly hired "short-tenured" worker:

- has an initial productivity equal to μ^Y, drawn from a uniform distribution $[\mu^L, \mu^H]$
- has a probability η of becoming "long-tenured".
- Conditional on becoming long-tenured the worker draws a new productivity value μ^O from a uniform distribution $[\mu^L, \phi\mu^H]$ where $\phi > 1$

3) Firing costs increase with workers tenure in the firm.
"low tenured" workers can be fired without cost
"high tenured" workers: firing cost= $F(1 + r + \lambda)$

r=interest rate

λ= a wedge which incorporates financial considerations, i.e. it is higher for more financially constrained firms.

Model (III)

Workers are hired by paying a fixed cost $v(1+r+\lambda)$.
Once the productivity μ^Y of a short-tenured worker is revealed, the firm fires her if $\mu^Y < \mu^Y_{min}$, where:

$$V^Y\left(\mu^Y_{min}\right) = 0,$$

- and V^Y is the value of the worker for the firm.

Once the productivity μ^O of a long-tenured worker is revealed, the firm fires her if $\mu^O < \mu^O_{min}$, where:

$$V^O\left(\mu^O_{min}\right) = -F(1+r+\lambda)$$

RESULT 1: The more the firm is financially constrained:
i) The more it discounts the option value of a low tenured worker
ii) The more is costly to fire a high tenured worker
Both results imply that μ^Y_{min} increases relative to μ^O_{min}, and therefore:

The more financially constrained is a firm, the more likely it will fire a short-tenured worker, and the less likely it will fire a high tenured worker, compared to a less financially constrained firm.

Model (IV)

A temporary shock reduces *A*. Productivity $\frac{A}{n_t^{1-\beta}}\mu$ of all workers fall.

Workers values V^Y and V^O fall, μ_{min}^Y and μ_{min}^O increase, and the firm fires both some low tenured and long-tenured workers.
What is the effect of financing frictions on the mix of low tenured and long-tenured workers that are fired because of this shock?

RESULT 2: The more the firm is financially constrained:

i) The more the value of its low tenured workers is driven by their current profitability $\left(\frac{A}{n^{1-\beta}}\mu^Y - w\right)$ rather than by their option value of becoming more productive in the future
ii) Therefore a temporary drop in A will have a much large negative effect on the value of low tenured workers for the more financially constrained firms.

After an exogenous shock which requires a reduction in employment, a more financially constrained firm will fire workers with relatively shorter tenures. to a less financially constrained firm.

Swedish labour Institutions – LIFO rules

- Firms larger than 10 employees: Last in first out rules.
- Lots of exceptions and loopholes – Relocation across narrowly defined job categories, and establishments.
- Bypassing the LIFO rule can be negotiated with the worker via a lump-sum severance pay + voluntary quit.
- LIFO rule translate into increasing firing costs for more tenured workers.

Swedish labour Institutions – Severance Pay

- Most workers under permanent contracts (6 month trial period).
- New workers have a notice period of 1 month, which increases by 1 month every 2 years to a maximum of 6 months.
- Most firings end up with a negotiated lump sum payment to avoid a lengthy notice period.
- Equilibrium that resembles a standard severance payment.
- The size of the severance pay monotonically increases with tenure and the current salary of the employee.

Swedish labour Institutions - Wage Compression

- Overall wage compression (90/10) ratio is second lowest in OECD after Norway
- Inherited from centralized bargaining it has survived the relaxation of central bargaining coverage.
- "Solidarity wage policy" (Rehn-Meider) aims to get "equal pay for equal work" increases within firm and within task wage compression
- Wages are likely to under-react to skill differential and changes in individual productivity.
- Overpaid short-tenure workers, long-tenure workers wages under-react to productivity.

Summary : Tenure and Firing Cash Flows

- Two sources of firing costs. Both are growing in employees tenure.
  - Costs to circumvent of LIFO rules
  - Notice periods and negotiated voluntary quits
  - We can use employee's tenure at a plant as a monotonic transformation of the firing cost.

- Option value of relatively overpaid low tenure workers vs tenured workers
  - Wage compression emphasizes the wage/productivity wedge
  - We can use employee's tenure at a plant as a monotonic as a proxy for future expected productivity

Financing constraints: RDD

- Discrete ratings are determined by underlying default probability
  - 1: p < 0.245%, 2: p<0.745%, 3: p<3.045%,
  - Compare firms that are close to these boundaries but on different sides → RDD (multi-threshold)
- No manipulation at the threshold, underlying model not exactly known by firms. High Volatility of Inter Annual Credit Score.

Rating	1-2	2-3	3-4	4-5
Threshold	0.245	0.745	3.045	8.045
Annual absolute deviation on a 5% neighbourhood				
Mean	0.15	0.43	1.7	5
Median	0.36	0.91	2.619	6.89

Financing Constraints and Employment

- Empirical puzzle: Small effects of financing constraints on total labour force levels.

Do they affect the composition of workers laid off?

- In particular: Is the tenure profile of laid off workers affected by financing constraints?

- Implications for:
  - The distribution of current and future worker productivity
  - Job security of long-tenure vs. short tenure workers
  - Skill acquisition, training and incentives

Financing Constraints and Tenure

Worker tenure at the firm is correlated with inter-temporal trade-off

- Longer tenure, higher upfront firing costs
  - Severance Pay
  - Steep tenure-age productivity profiles plus wage compression
  - Firm-specific human capital without firm commitment

- Longer tenure, lower upfront firing costs
  - Career concern incentives and firm commitment
  - Preferences for steeper wage profiles

Financing Constraints and Tenure

Worker tenure at the firm is correlated with inter-temporal trade-off

- Longer tenure, higher upfront firing costs
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  - Firm-specific human capital without firm commitment

- Longer tenure, lower upfront firing costs
  - Career concern incentives and firm commitment
  - Preferences for steeper wage profiles

- Theoretical model: Severance pay and productivity profiles
  - Financing constraints create distortions to optimal firing policy
  - Frictions amplify each other

Estimation strategy: Firm level

$$y_{ft} = \alpha + \theta Shock_{ft-1} + \beta_1 (C_{ft} * Shock_{ft-1}) + \beta_2 C_{ft} + \varepsilon_{ft}$$

- $Shock_{ft-1}$: dummy=1 if export shock
- C_{ft} financial constrains (ratings 1, 2, 3 least to most constrained)

- y_{ft} is the variable of interest
  - Low tenure: fraction of labour force with tenure of 0−2 years.

Estimation strategy: Worker Level

$$y_{ift} = \alpha + \beta_1 Shock_{ft-1} + \beta_2 C_{ft} + \beta_3 (C_{j,f} * Shock_{ft-1})$$

$$+\beta_4 Short\_tenured_{it} \quad + \beta_5 (Short\_tenured_{it} * Shock_{ft-1})$$

$$+ \beta_6 C_{ft} Short\_tenured_{it} * Shock_{ft-1} + \varepsilon_{it}$$

- $Shock_{ft-1}$: dummy=1 if export shock
- $C_{j,f}$ financial constrains (inverse ratings)

- y_{ft} is the variable of interest
  - Dummy variable takes value 1 if worker is fired next year.

Results: Worker Level (1 – 2)

	Fired Next Year			
	(1)	(2)	(3)	(4)
Short-tenure	0.070***	0.069***	0.064***	0.054***
	(0.000)	(0.000)	(0.002)	(0.003)
Shock (large)	0.002***	0.007***	0.007***	-
	(0.000)	(0.000)	(0.000)	-
Short-tenure X Shock (large)	-0.025***	-0.020***	-0.020***	-0.018***
	(0.001)	(0.001)	(0.001)	(0.001)
Rating 1 vs. 2	0.009***	-0.006***	-0.009***	-
	(0.000)	(0.000)	(0.002)	-
Short-tenure X Rating 1 vs. 2	0.017***	0.014***	0.021***	0.029***
	(0.001)	(0.001)	(0.003)	(0.004)
Shock (large)=1 X Rating 1 vs. 2	-0.005***	-0.001	-0.001	-
	(0.001)	(0.001)	(0.001)	-
Short-tenure X Shock (large)=1 X Rating 1 vs. 2	0.015***	0.013***	0.013***	0.006***
	(0.001)	(0.001)	(0.001)	(0.002)
Observations	5342003	5342004	5342005	5342006
Polynomials	No	No	Yes	No
Industry-Year fixed effects	Yes	Yes	Yes	Yes
Firm fixed effects	No	Firm	Firm	Firm-Year

Results: Worker Level (2 –3)

	Fired Next Year			
	(1)	(2)	(3)	(4)
Short-tenure	0.087***	0.084***	0.315***	0.277***
	(0.000)	(0.001)	(0.046)	(0.052)
Shock (large)	-0.004***	0.004***	0.004***	-
	(0.001)	(0.001)	(0.001)	-
Short-tenure X Shock (large)	-0.010***	-0.008***	-0.008***	-0.012***
	(0.001)	(0.001)	(0.001)	(0.001)
Rating 2 vs. 3	0.004***	0.002***	-0.001	-
	(0.000)	(0.000)	(0.001)	-
Short-tenure X Rating 2 vs. 3	-0.003***	-0.004***	-0.003	-0.002
	(0.001)	(0.001)	(0.002)	(0.002)
Shock (large)=1 X Rating 2 vs. 3	0.007***	-0.003**	-0.003**	-
	(0.001)	(0.001)	(0.001)	-
Short-tenure X Shock (large)=1 X Rating 2 vs. 3	-0.004**	0.003	0.003*	0.006***
	(0.002)	(0.002)	(0.002)	(0.002)
Observations	3178299	3178300	3178301	3178302
Polynomials	No	No	Yes	No
Industry-Year fixed effects	Yes	Yes	Yes	Yes
Firm fixed effects	No	Firm	Firm	Firm-Year

Results: Worker Level (Within Year Shock)

	Fired Next Year			
	(1)	(2)	(3)	(4)
Short-tenure	0.066***	0.066***	0.082***	0.087***
	(0.000)	(0.001)	(0.002)	(0.002)
Shock (small)	0.002***	0.010***	0.009***	-
	(0.000)	(0.001)	(0.001)	-
Short-tenure X Shock (large)	-0.027***	-0.022***	-0.022***	-0.021***
	(0.001)	(0.001)	(0.001)	(0.001)
Rating	0.007***	-0.002***	0.002***	-
	(0.000)	(0.000)	(0.001)	-
Short-tenure X Rating	0.007***	0.005***	0.000	-0.002
	(0.000)	(0.000)	(0.001)	(0.001)
Shock (large)=1 X Rating	-0.001***	-0.003***	-0.003***	-
	(0.000)	(0.000)	(0.000)	-
Short-tenure X Shock (small)=1 X Rating	0.005***	0.005***	0.005***	0.005***
	(0.001)	(0.001)	(0.001)	(0.001)
Observations	7123973	7123973	7123973	7123973
Polynomials	No	No	Yes	No
Industry-Year fixed effects	Yes	Yes	Yes	Yes
Firm fixed effects	No	Firm	Firm	Firm-Year

Results: Worker Level (Previous Gold)

	Fired Next Year			
	(1)	(2)	(3)	(4)
Short-tenure	0.070***	0.069***	0.097***	0.073***
	(0.001)	(0.001)	(0.003)	(0.001)
Shock (large)	0.009***	0.022***	0.022***	-
	(0.001)	(0.002)	(0.002)	-
Short-tenure X Shock (large)	-0.058***	-0.046***	-0.044***	-0.033***
	(0.002)	(0.003)	(0.003)	(0.003)
Rating 1 vs. 2	0.006***	0.002***	0.011***	-
	(0.000)	(0.001)	(0.002)	-
Short-tenure X Rating 1 vs. 2	-0.002**	-0.000	-0.007***	-0.002**
	(0.001)	(0.001)	(0.003)	(0.001)
Shock (large)=1 X Rating 1 vs. 2	-0.007***	-0.012***	-0.013***	-
	(0.001)	(0.001)	(0.001)	-
Short-tenure X Shock (large)=1 X Rating 1 vs. 2	0.026***	0.021***	0.019***	0.013***
	(0.002)	(0.002)	(0.002)	(0.002)
Observations	2611297	2611297	2611297	2611298
Polynomials	No	No	Yes	No
Industry-Year fixed effects	Yes	Yes	Yes	Yes
Firm fixed effects	No	Firm	Firm	Firm-Year