

# Firms' financing constraints: Do perceptions match the actual situation?

Annalisa Ferrando    Klaas Mulier

*European Central Bank*    *Ghent University*

24 June 2013

*“The financing environment and access to finance for euro area firms are important elements in the policy-making process of the ECB”*

Benoît Coeuré

Member of the Executive Board of the European Central Bank

13 December 2012

- Important to get a better understanding of the nature of financing constraints.
- This paper investigates which firm characteristics are correlated with firm's self reported financing constraints during the recent crisis.
- PROBLEM:
  - Surveys lack balance sheet information
  - Surveys are anonymous, no firm identity
  - Balance sheet datasets do not observe financing constraints

- Dealing with the identity problem
  - Match the survey firm with its *nearest neighbour* from a large balance sheet dataset
  - Restrict matching within groups that generally have similar financial characteristics
    - Non-parametric nearest neighbour distance hot deck matching

# Outline

- Data and Methodology
  - Data
  - Matching procedure
  - Empirical strategy
- Results
- Robustness
- Conclusion

## SAFE

Question	Answer	Variable	Value
Q0 What is currently your most pressing problem?	Finding customers	finance problem	0
	Competition	finance problem	0
	Access to finance	finance problem	1
	Costs of production or labour	finance problem	0
	Availability skilled staff/managers	finance problem	0
	Regulation	finance problem	0
	Other	finance problem	0
Q7a Which action did you take with respect to bank loans, TC or other external finance?	Didn't apply, sufficient internal funds	finance obstacle	missing
	Didn't apply because other reasons	finance obstacle	missing
	Didn't apply out of fear of rejection	finance obstacle	missing
	Applied	finance obstacle	go to Q7b
Q7b What was the outcome if you applied for bank loans, TC or other external finance ?	Applied and got everything	finance obstacle	0
	Applied but only got part of it	finance obstacle	1
	Applied but refused, cost too high	finance obstacle	1
	Applied but was rejected	finance obstacle	1

## AMADEUS

Firm characteristics	Variables
Profitability	Return on equity, profit margin, coverage ratio
Leverage	Debt to assets, debt-cash to assets, short term loans to assets
Liquidity	Working capital, required working capital, cash
non financial	Age, size

## SAFE

Firm	finance problem	finance obstacle
1	0	1
2	0	0
	⋮	
4281	0	.
4282	1	1
	⋮	
13291	1	.

## AMADEUS

Firm	profit margin	debt to assets	cash
1	0.05	0.67	0.10
		⋮	
150313	-0.07	0.42	0.16
		.	
240313	0.01	0.52	0.08
		⋮	
2000000	-0.01	0.70	0.14
		⋮	
3236353	0.15	0.29	0.02

- Definition of 756 groups common to both datasets
  - 9 countries (BE, DE, ES, FI, FR, GR, IT, NL, PT)
  - 7 sectors (min, con, man, who/ret, tran, re, ser)
  - 4 turnover classes (0-2 mill, 2-10 mill, 10-50 mill, 50+ mill)
  - 3 years (2009, 2010, 2011)
  
- Matching only within group
  
- Gower distance function  $d_{S,A}$

$$d_{S,A} = \frac{1}{T} \sum_{t=1}^T \left[ \frac{1}{2} \frac{|X_S^{age} - X_A^{age}|}{Range^{age}} + \frac{1}{2} \frac{|X_S^{empl} - X_A^{empl}|}{Range^{empl}} \right]$$



## ■ Matching only within group

	SAFE		AMADEUS	
	Finance Problem	Finance Obstacle	Debt Burden <sub>t-1</sub>	Cash <sub>t-1</sub>
<b>Turnover Class</b>				
0-2 mill	18.5%	45.2%	2.87%	0.125
2-10 mill	17.1%	40.7%	2.33%	0.105
10-50 mill	13.8%	36.8%	2.15%	0.081
50+ mill	11.7%	34.3%	2.24%	0.059
<b>Year</b>				
2009	19.2%	37.8%	3.20%	0.111
2010	15.0%	42.4%	2.66%	0.115
2011	16.2%	43.0%	2.02%	0.125

## Bivariate probit model:

$$\begin{aligned}
 FinanceProblem_{i,t} = & \alpha_0 + \alpha_1 FinancialRatio_{i,t} + \sum_j \alpha_j FirmControls(j)_{i,t} + \\
 & \sum_k \alpha_k Country_k + \sum_s \alpha_s Sector_s + \sum_t \alpha_t Year_t + \epsilon_{i,t}
 \end{aligned}$$

$$\begin{aligned}
 FinanceObstacle_{i,t} = & \beta_0 + \beta_1 FinancialRatio_{i,t} + \sum_j \beta_j FirmControls(j)_{i,t} + \\
 & \sum_k \beta_k Country_k + \sum_s \beta_s Sector_s + \sum_t \beta_t Year_t + \mu_{i,t}
 \end{aligned}$$

$$COV(\mu_{i,k,t}, \epsilon_{i,k,t}) = \rho \neq 0$$

## ■ T-test on the equality of means

	Finance Problem=0	Finance Problem=1	T-test	Finance Obstacle=0	Finance Obstacle=1	T-test
<b>Profitability</b>						
Return on equity	0.108	0.094	0.08*	0.099	0.062	0.02**
Profit margin	0.010	0.002	0.00***	0.011	-0.000	0.00***
<b>Liquidity</b>						
Workcap	0.162	0.144	0.01***	0.160	0.123	0.00***
Cash	0.113	0.110	0.18	0.099	0.099	0.52
<b>Leverage</b>						
Leverage	0.706	0.719	0.04**	0.697	0.730	0.00***
short term loans	0.083	0.095	0.00***	0.091	0.101	0.04**
<b>Asymmetric info</b>						
age	23.98	19.76	0.00***	24.67	20.88	0.00***
log(assets)	7.928	7.663	0.00***	8.323	8.073	0.00***

	(1)		(2)	
	Finance Problem	Finance Obstacle	Finance Problem	Finance Obstacle
Return on equity	-0.009 (0.060)	-0.117* (0.062)	-0.035 (0.060)	-0.138** (0.061)
Workcap	-0.236** (0.129)	-0.267*** (0.092)	-0.167* (0.095)	-0.213** (0.092)
Short term loans	0.129 (0.220)	-0.105 (0.213)	0.192 (0.221)	-0.054 (0.213)
log(total assets)			-0.022 (0.016)	-0.006 (0.015)
log(age)			-0.138*** (0.036)	-0.125*** (0.035)
$\rho$		0.634*** (0.039)		0.625*** (0.039)
Control dummies		YES		YES
#obs		2,381		2,381

	(1)		(2)	
	Finance Problem	Finance Obstacle	Finance Problem	Finance Obstacle
Return on equity	-0.012 (0.060)	-0.117* (0.062)	-0.036 (0.060)	-0.137** (0.061)
Workcap	-0.226** (0.113)	-0.205* (0.110)	-0.225** (0.114)	-0.200* (0.110)
Leverage	0.046 (0.116)	0.081 (0.112)	-0.057 (0.120)	0.009 (0.114)
log(total assets)			-0.023 (0.016)	-0.005 (0.015)
log(age)			-0.138*** (0.036)	-0.125*** (0.035)
$\rho$		0.633*** (0.039)		0.625*** (0.039)
Control dummies		YES		YES
#obs		2,381		2,381

■ Including 'fear of rejection' in finance obstacle: 1

	(1)		(2)	
	Finance Problem	Finance Obstacle	Finance Problem	Finance Obstacle
Return on equity	0.035 (0.049)	-0.094* (0.049)	0.010 (0.049)	-0.131*** (0.049)
Workcap	-0.241** (0.097)	-0.160* (0.095)	-0.246** (0.097)	-0.174* (0.095)
Leverage	0.026 (0.105)	0.135 (0.105)	-0.098 (0.108)	-0.031 (0.107)
log(total assets)			-0.032** (0.014)	-0.057*** (0.013)
log(age)			-0.134*** (0.030)	-0.153*** (0.030)
$\rho$	0.665*** (0.033)		0.546*** (0.033)	
Control dummies	YES		YES	
#obs	3,192		3,192	

- 37% random matches
- bootstrap 200 draws

Panel A	(A1)		(A2)	
	Finance Problem	Finance Obstacle	Finance Problem	Finance Obstacle
Profit margin	-0.361 [-1.114,0.446]	-0.785** [-1.439,-0.073]	-0.319 [-1.082,0.528]	-0.769** [-1.423,-0.039]
Workcap	-0.094 [-0.303,0.089]	-0.189* [-0.357,0.020]	-0.023 [-0.227,0.178]	-0.126 [-0.291,0.109]
Short term loans	0.389 [-0.066,0.837]	0.044 [-0.371,0.496]	0.415* [-0.011,0.884]	0.085 [-0.336,0.515]
log(total assets)			-0.020 [-0.056,0.014]	-0.004 [-0.035,0.026]
log(age)			-0.150*** [-0.220,-0.075]	-0.131*** [-0.209,-0.059]
Control dummies	YES		YES	

- 9 euro area countries
- 11,886 firms
- 13,291 observation
- 2009-2011
- survey data (SAFE) matched with balance sheet data (AMADEUS)

## Findings:

- More profitable firms  $\Rightarrow$  more likely to get access to finance.
- Young firms  $\Rightarrow$  less likely to get access to finance.
- Firms with high short term debt  $\Rightarrow$  more likely to perceive access to finance as most pressing problem.
- Size not important, because 'fear of rejection' is not included.



Variable	Definition
Return on equity	profit or loss of the period / total shareholder funds
Coverage ratio	operating profit or loss / interest payment
Profit margin	profit or loss of the period / total sales
Workcap	(current assets - current liabilities) / total assets
Workcap required	(accounts receivable + inventories - accounts payable) / total assets
Cash	cash and cash equivalent / total assets
Debt	current liabilities + non current liabilities
Leverage	debt / total assets
Leverage cleaned	(debt - cash and cash equivalent) / total assets
Short term loans	loans with maturity less than one year / total assets
Log(age)	log(1+ age)
Log(total assets)	log(1+ total assets)
Debt burden	interest payment / (debt-accounts payable)