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A beacon in the night: public-sector certification of SMEs towards banks

José Martí Pellón
jmartipe@ucm.es
Complutense University of Madrid

Anita Quas
quas@em-lyon.com
EMLYON Business School

SMEs access to external finance

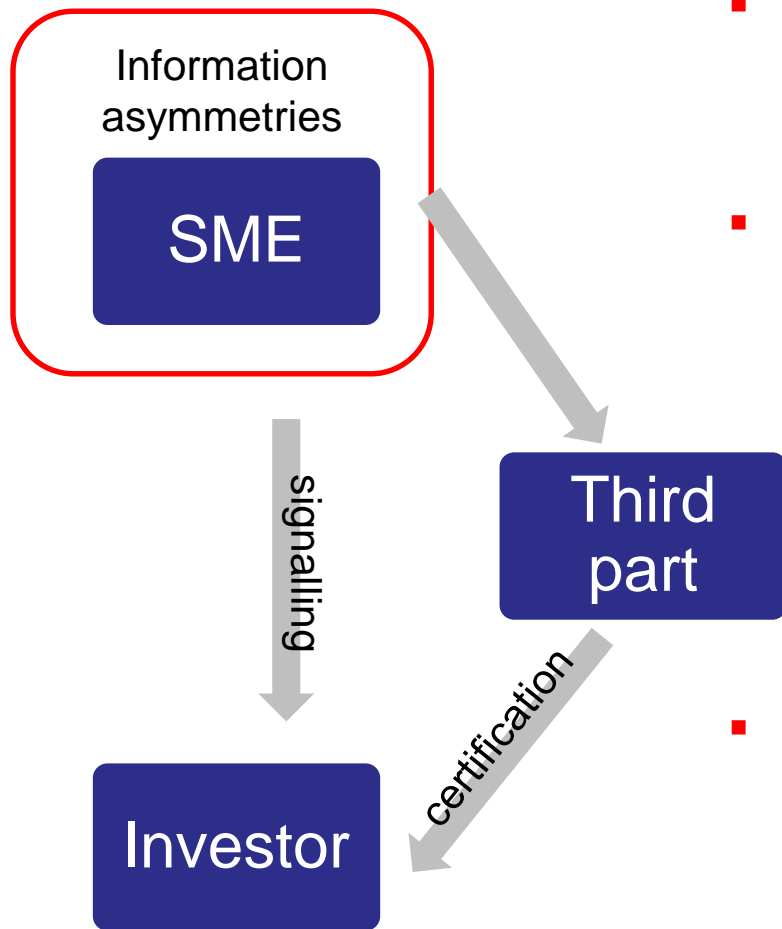
- Bank loans are the most familiar source of external financing for SMEs (*Beck, et al. 2008*)
- Access to commercial debt is more difficult and costly for SMEs than for bigger companies
 - Information opacity and adverse selection (*Berger and Udell, 1998*).
 - Alternatives (Venture capital, public markets) are difficult to approach
- Financing gap
- Since SMEs account for the majority of employment, this problem raised interest by policymakers (*Infelise, 2014*)
 - Several consequences
 - > Improved access to external sources thanks to certification

Motivations

In this paper

- We study under which circumstances the effects of certification are stronger
- We focus on a particular type of public intervention: participative loans
 - Allocated after a detailed screening process
 - Remuneration = pre-determined interest rate + share of the earnings of the borrower
 - Quasi-equity initiative
 - > Lower burden in terms of government spending than subsidies
 - > Lower risk for investor than equity investments
 - > The owners do not face dilution at a very early stage
 - Especially common in Spain
 - > Should they be used elsewhere?

Signalling and certification



- Information asymmetry
 - Generates adverse selection problems (*Eisenhardt, 1989*)
- Signaling
 - Signals are “activities or attributes of individuals in a market which by design or accident, alter the beliefs of, or convey information to, other individuals in the market“ (*Spence, 1974, p.1*)
 - Allows high-quality agents to be differentiated from the low-quality ones (*Akerlof, 1970; Spence, 1974*)
- Signals sent by third parties: certification (*Lerner, 2002*)
 - Third parties’ direct involvement in the signal sent to ‘certify’ the quality of the signaler (*Kleer, 2010*)

Literature review

The government as certifying body

Paper	Initiative	Country	Certify towards
Lerner, 1999	SBIR (R&D subsidy)	USA	Venture Capitalists
Feldman and Kelly, 2006	ATP (R&D subsidy)	USA	Venture capitalists, state, other
Meuleman and De Maeseneire, 2012	R&D subsidies	Belgium	Equity providers, debt providers
Guerini and Quas, 2015	Governmental venture capital	Europe	Private venture capitalists

- The funding must be awarded selectively (*Colombo et al., 2011*)
- Partipative loans are awarded after careful screening of the government-supported institutions
- Potentially a stronger signal than subsidies, especially towards banks (*Huergo et al., 2013*)
 - Certification agency side: High incentive for careful screening, due to high potential return on the investment
 - SME side: higher commitment to repay the debt and increase in trustworthiness as borrowers (*Huergo and Moreno, 2014*)

Theoretical framework

Hypotheses

- We expect SMEs receiving a participative loan from a government-supported institution will increase their ability to raise debt from other external sources
 - *Under which conditions the effect is stronger?*

	Arguments	Exp. Sign
Smaller firms	Less well-known; often unable to provide audited financial statements ; high fixed cost of information collection for banks (<i>Bernanke et al., 1996, Binks & Ennew, 1996</i>)	+
Younger firms	Lack a track record; scarce visibility in the market; higher levels of uncertainty (<i>Sørensen and Stuart, 2000; Carpenter and Petersen, 2002; Hall, 2002; Stuart et al., 1999</i>)	+
High Tech firms	More complicated products and business plans; low share of tangibles, Stronger appropriability concerns (<i>Binks & Ennew, 1996</i>)	+
Previous subsidies recipient firms	Non additionality of signals from similar certification bodies (<i>Pollock et al., 2010</i>)	-
Venture Capital backed firms	Non additionality of signals from different certification bodies (<i>Pollock et al., 2010</i>)	-

Data and method

Sample

■ ENISA-backed companies

- **Population:** participative loans granted by ENISA between 2005 and 2010 through the programs EBT, PYME and JOVENES
- **Sample:** Available accounting data (source: Orbis) on 461 firms that received 579 loans from ENISA, representing 66% of the population

■ Control group: 623 “twins” of the 461 ENISA-backed companies

- **First step:** random selection of about 5,000 firms that did not receive a loan from ENISA with full accounting data (source: Orbis)
- **Second step:** propensity score matching
 - > Matching variables: $\log Debt_{i,t-1}$, $\log Debt_{i,t-2}$, $\log TotalAssets_{i,t-1}$, $TotalAsseysGrowth_{i,t-1}$, $\log Equity_{i,t}$, $Tangibles_{i,t-1}$, $Profitability_{i,t-1}$, $VentureCapital_{i,t}$, $SubLoan_{i,t}$ (CDTI or ACCIO), $\log Age_{i,t}$, regional, time and industry dummies
 - > Exact matching on age for age <10
 - > 1:2 nearest neighbors (robustness checks: 1:1 and 1:3)
 - > Observations 5 or more years before the matching are excluded.
 - > Placebo test

■ Observation period: 2001-2012

Econometric model

- Generalized Least Square (GLS) with fixed effects

$$\log DebtNET_{i,t} = \alpha_2 ENISA_{i,t} + \beta X_{i,t} + v_i + e_{it}$$

$$\log DebtNET_{i,t} = \log(DebtNET_{i,t} - ENISA_AmountOwed_{i,t})$$

Based on amount granted, years before the first payment of the principal, maturity, amount due in 2013

- WIP: growth model and GMM

- X : $\log TotalAssets_{i,t-1}$, $\log Equity_{i,t}$, $Tangibles_{i,t-1}$, $Intangibles_{i,t-1}$,

$Profitability_{i,t-1}$, $VentureCapital_{i,t}$, $SubLoan_{i,t}$ (CDTI or ACCIO), $\log Age_{i,t}$,

time dummies

Results

Hypotheses testing

	I	II	III	IV	V	VI	VII
<i>Constant</i>	0.837 *** (0.308)	1.003 *** (0.310)	1.053 *** (0.310)	1.016 *** (0.312)	1.046 *** (0.310)	0.972 *** (0.309)	1.002 *** (0.310)
<i>logTotalAssets_{i,t-1}</i>	0.578 *** (0.029)	0.563 *** (0.029)	0.553 *** (0.030)	0.562 *** (0.029)	0.556 *** (0.030)	0.569 *** (0.029)	0.563 *** (0.029)
<i>Tangibles_{i,t-1}</i>	0.598 *** (0.154)	0.587 *** (0.154)	0.607 *** (0.154)	0.590 *** (0.154)	0.604 *** (0.154)	0.581 *** (0.154)	0.587 *** (0.154)
<i>Intangibles_{i,t-1}</i>	1.049 *** (0.138)	1.005 *** (0.138)	0.993 *** (0.139)	1.006 *** (0.139)	0.991 *** (0.138)	1.028 *** (0.139)	1.005 *** (0.139)
<i>Profitability_{i,t-1}</i>	-0.197 *** (0.055)	-0.190 *** (0.055)	-0.188 *** (0.055)	-0.190 *** (0.055)	-0.191 *** (0.055)	-0.194 *** (0.055)	-0.190 *** (0.055)
<i>logEquity_{i,t-1}</i>	-0.060 *** (0.023)	-0.070 *** (0.023)	-0.068 *** (0.023)	-0.070 *** (0.023)	-0.068 *** (0.023)	-0.074 *** (0.023)	-0.070 *** (0.023)
<i>logAge_{i,t}</i>	-0.360 *** (0.111)	-0.342 *** (0.111)	-0.384 *** (0.112)	-0.356 *** (0.117)	-0.342 *** (0.111)	-0.320 *** (0.111)	-0.341 *** (0.112)
<i>VentureCapital_{i,t}</i>	0.255 *** (0.091)	0.235 *** (0.091)	0.234 *** (0.091)	0.233 ** (0.091)	0.237 *** (0.091)	0.219 ** (0.091)	0.235 ** (0.091)
<i>SubLoans_{i,t}</i>	0.994 *** (0.222)	0.976 *** (0.222)	0.941 *** (0.222)	0.975 *** (0.222)	0.971 *** (0.222)	1.124 *** (0.227)	0.976 *** (0.223)
<i>ENISA_{i,t}</i>		0.266 *** (0.064)	0.950 *** (0.296)	0.291 *** (0.091)	0.059 (0.096)	0.313 *** (0.066)	0.268 *** (0.075)
<i>SizeAtTimeOfLoan_{i,t}</i>			-0.093** (0.039)				
<i>AgeAtTimeofLoan_{i,t}</i>				-0.002 (0.006)			
<i>ENISA_{i,t} *HighTech_i</i>					0.326***		

Robustness checks

Selection effects

- Two-step approach with IV: • First step: Cox survival model (Cox, 1972) on the ENISA receipt

	First Step
$\log TotalAssets_{i,t-1}$	0.033 (0.058)
$Tangibles_{i,t-1}$	0.133 (0.297)
$Intangibles_{i,t-1}$	1.802 *** (0.247)
$Profitability_{i,t-1}$	-0.251 ** (0.099)
$\log Equity_{i,t-1}$	-0.017 (0.038)
$VentureCapital_{i,t}$	0.150 (0.131)
$SubLoans_{i,t}$	0.169 (0.196)
$EquityGrowth_{i,t-1}$	0.195 *** (0.051)
$ENISAavailability_{i,t}$	0.015 *** (0.002)
n	3019
N	861

- Second step: λ_{ENISA} , generalization of IMR (Heckman, 1979, Lee 1983).

	I	II	III	IV	V
$ENISA_{i,t}$	0.990 *** (0.328)	0.154 (0.099)	-0.007 (0.097)	0.201 *** (0.068)	0.190 ** (0.076)
λ_{ENISA}	-0.014 (0.077)	-0.029 (0.081)	-0.029 (0.077)	-0.013 (0.077)	-0.020 (0.077)
$SizeAtTimeOfENISA_{i,t}$	-0.108 ** (0.043)				
$AgeAtTimeofENISA_{i,t}$		0.002 (0.007)			
$ENISA_{i,t} * HighTech_i$			0.295 *** (0.114)		
$SubLoanAtTimeofENISA_{i,t}$				-0.400 * (0.236)	
$VCAAtTimeofENISA_{i,t}$					-0.042 (0.119)
r^2	0.431	0.49	0.478	0.493	0.489

Control variables, constant, year and company FE are included. N= 1,080 , n= 5,819.

Robustness checks

Reduced risk of default

- Two-step approach with IV: • First step: Cox survival model (Cox, 1972) on liquidation event

	First step
$\log TotalAssets_{i,t-1}$	-0.143 (0.144)
$Tangibles_{i,t-1}$	0.342 (0.697)
$Intangibles_{i,t-1}$	1.508 ** (0.694)
$Profitability_{i,t-1}$	-0.148 (0.122)
$\log Equity_{i,t-1}$	0.322 *** (0.108)
$VentureCapital_{i,t}$	0.882 *** (0.297)
$SubLoans_{i,t}$	0.074 (0.659)
$DeathRate2009_i$	27.527 (31.377)
$Population2008_i$	0.001 (0.003)
$ENISA_{i,t}$	1.222 *** (0.288)
n	6088
N	1107

- Second step: $\lambda_{\text{liquidation}}$, generalization of IMR (Heckman, 1979, Lee's 1983).

	I	II	III	IV	V
$ENISA_{i,t}$	0.950 *** (0.296)	0.290 *** (0.091)	0.059 (0.096)	0.313 *** (0.066)	0.268 *** -0.075
$\lambda_{\text{liquidation}}$	-0.014 (0.048)	-0.013 (0.048)	-0.016 (0.048)	-0.014 (0.048)	-0.014 -0.048
$SizeAtTimeOfENISA_{i,t}$	-0.093 ** (0.039)				
$AgeAtTimeofENISA_{i,t}$		-0.002 (0.006)			
$ENISA_{i,t} * HighTech_i$			0.327 *** (0.112)		
$SubLoanAtTimeofENISA_{i,t}$				-0.628 *** (0.208)	
$VCAAtTimeofENISA_{i,t}$					-0.004 -0.115
r^2	0.302	0.358	0.358	0.371	0.365

Control variables, constant, year and company FE are included. N= 1,080 , n= 5,819.

Other alternative explanations

- Treated firms can buy more tangibles to be used as collateral
- Companies in high tech sectors may have a higher debt capacity
 - $DebtCapacity_i$ = mean leverage (i.e., total financial debt over total assets) in 2007 of all available companies in Orbis, operating in the same NACE v.2 3-digit sector of the focal company, and located in the United Kingdom.

	I RE	II FE
$Tangibles_{i,t-1}$	0.854*** (0.162)	0.963*** (0.129)
$ENISA_{i,t}$	0.481*** (0.077)	-0.097 (0.086)
$ENISA_{i,t} * Tangibles_{i,t-1}$	-1.185*** (0.235)	
$DebtCapacity_i$		1.017* (0.574)
$HighTech_i$		-0.125 (0.176)
$ENISA_{i,t} * HighTech_i$		0.331*** (0.102)
r^2	0.358	0.535

Conclusions and discussion

Results

- Receipt of participative loans increases the financial debt of recipient firms, beyond the value of the loan
- The effect is stronger for smaller firms and high tech companies that never received subsidized loans, characterized by higher information asymmetries
 - certification effect of governmental participative loans

Implications

- The study supports the use of participative loans by governmental agencies
- The reputation of the certifying agency is fundamental

Steps forward

- Why VC's and government's certification effects do not substitute each other
- Compare participative loans with other types of government intervention
- Expand the geographical focus
- ...

THANK YOU

quas@em-lyon.com

APPENDIX

Empirical setting

ENISA

- Spanish Ministry of Industry, Energy and Tourism
- Established in 1982
- Initially governmental venture capital
- Switched from equity to a quasi-equity long-term financial instruments since 1995

Participative loans

- Maturity: 4 - 9 years,
- First repayment of principal after 1 - 7 years
- Floating explicit interest rate
- Collateral not required
- The borrower must raise an additional equity amount from other sources, ranging from 15% to 100% of the amount of the loan granted

Eligibility

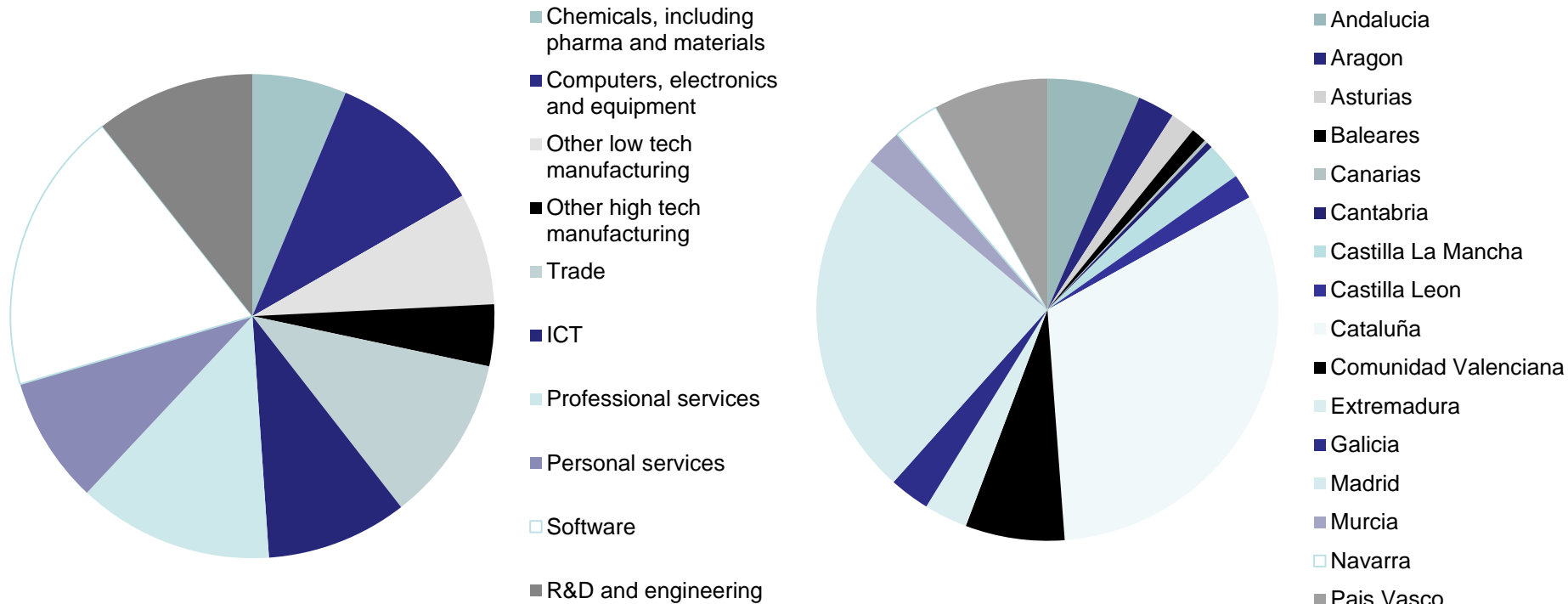
- SME
- established in Spain
- not operating in real estate or financial services
- with innovative business model and competitive advantage
- Proved technical and economic feasibility of the project

Programs

- high-technology firms (EBT program),
- high-growth firms (PYME program)
- since 2010, recently established firms (JOVENES program)

Data and method

Sample: ENISA-backed companies



Variables: summary statistics

Variable	N	n	Mean	Median	Std. Dev.	Min	Max
<i>logDebtNET_{i,t}</i>	1 084	5761	6.137	6.394	2.241	0.000	11.199
<i>logDebtNET_{i,t-1}</i>	1 084	5761	5.588	6.046	2.664	0.000	11.199
<i>ENISA_{i,t}</i>	1 084	5761	0.255	0.000	0.436	0.000	1.000
<i>logTotalAssets_{i,t-1}</i>	1 084	5761	7.454	7.491	1.596	0.000	11.488
<i>TotalAssetsGrowth_{i,t-1}</i>	1 084	5761	0.680	0.185	1.523	-3.667	10.378
<i>Tangibles_{i,t}</i>	1 084	5761	0.189	0.093	0.220	0.000	0.930
<i>Profitability_{i,t-1}</i>	1 084	5761	0.001	0.046	0.346	-8.469	3.640
<i>logEquity_{i,t-1}</i>	1 084	5761	4.874	5.038	2.140	0.000	10.216
<i>logAge_{i,t}</i>	1 084	5761	2.044	1.946	0.758	0.693	4.094
<i>VentureCapital_{i,t}</i>	1 084	5761	0.316	0.000	0.465	0.000	1.000
<i>SubLoans_{i,t}</i>	1 084	5761	0.070	0.000	0.255	0.000	1.000

Variables: correlation matrix

Variable	1	2	3	4	5	6	7	8	9
1 <i>ENISA</i> _{<i>i,t</i>}	1.00								
2 <i>logTotalAssets</i> _{<i>i,t-1</i>}	0.08	1.00							
3 <i>TotalAssetsGrowth</i> _{<i>i,t-1</i>}	-0.02	-0.27	1.00						
4 <i>Tangibles</i> _{<i>i,t</i>}	-0.03	0.12	0.01	1.00					
5 <i>Profitability</i> _{<i>i,t-1</i>}	-0.07	0.21	-0.07	0.01	1.00				
6 <i>logEquity</i> _{<i>i,t-1</i>}	0.08	0.65	-0.14	0.17	0.02	1.00			
7 <i>logAge</i> _{<i>i,t</i>}	-0.02	0.51	-0.55	0.00	0.19	0.26	1.00		
8 <i>VentureCapital</i> _{<i>i,t</i>}	0.10	0.16	0.00	0.05	-0.08	0.22	-0.07		
9 <i>SubLoans</i> _{<i>i,t</i>}	0.10	-0.13	0.06	-0.09	-0.07	-0.06	-0.17	-0.06	1.00



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