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SME Lifecycle and Non-Bank Financing in Europe: What Determines Usage?

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Financial crisis has increased focus on access to finance for European enterprises

- ▶ Much research and policy attention on supply of bank credit (including Ferrando and Greisshaber, 2011; Holton et al., 2014)
- ▶ Impact of bank credit supply constraints on enterprise performance and activity (Campello et al., 2010; Gerlach-Kristen et al., 2014)
- ▶ Particularly salient for SMEs - lack of collateral, no track record, asset intangibility

However, policy also focused on broadening and diversifying financing options for SMEs

- ▶ Balancing capital structures and reducing leverage can improve resilience
- ▶ Also if financing is diverse, impact on enterprises of supply constraints on one type is reduced
- ▶ Work by ESCB (2013), EIB/EIF (2013) and EC Green Paper on Long Term Financing
- ▶ Move towards developing a capital markets union



This research asks:

- a How does the usage of non-bank financing differ across SMEs lifecycle?
- b Does financial distress, bank-finance conditionality and access to credit as well as trading risk affect the probability of using alternative financing?
- c Do time-varying country factors impact the usage of SME non-bank financing?



Research links to a number of literatures:

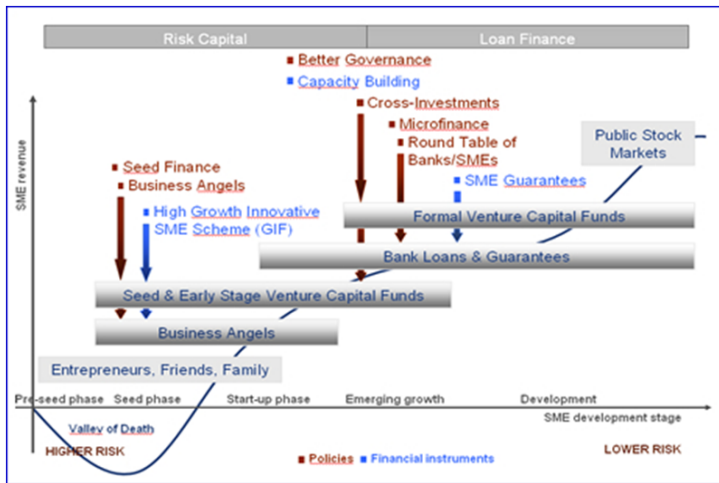
- ▶ Pecking order theory of capital structure (Myers and Majluf, 1984).
- ▶ Financing lifecycle view (Berger and Udell, 1998)

Close studies:

- ▶ Single country research on lifecycle view - model debt to equity or leverage ratios (La Rocca et al., 2011; Joeveer, 2013).
- ▶ Single country on equity, debt and other usage ratios (Mac an Bhaird and Lucey, 2010).
- ▶ Other work on substitution between different types of financing (bank and trade credit for example) (Casey and O'Toole, 2014; Maier and Walker, 1987; Love et al., 2007; Guariglia and Mateut, 2006).



European Commission Financing Lifecycle



Source: EC



Contribution:

- ▶ a) we look at a range of non-bank debt financing namely issued debt, trade credit, other loans from informal or business sources or leasing/factoring/hire-purchases as well as considering equity and mezzanine usage;
- ▶ b) we explore the usage of financing across 20 European countries which ensures the findings are not country specific.
- ▶ c) Model lifecycle using age, size categories
- ▶ d) Disentangle borrower related risk factors
 1. Trading risk
 2. Bank lending conditions
 3. Credit constraints
 4. Financial distress
- ▶ Link to short term time varying country factors - GDP growth, inflation, sovereign bond yield, debt to GDP



Research hypothesis motivated to explore use of non-bank financing across the lifecycle:

- H1: Early stage firms have an increased likelihood of using informal sources of finance.¹
- H2: Issued debt finance is used by larger, mature firms.
- H3: Trade credit is used across the lifecycle except for very young firms.
- H4: Equity can be used across the lifecycle but the source of equity finance differs.
- H5: Mezzanine finance is more suited to medium-sized firms.

The second group of hypotheses relate to the control indices and measures of bank constraints:

- H6: Both trading risk and financial distress should lower the usage of formal non-bank finance.
- H7: Tightened bank lending conditions or credit constraints should increase the use of non-bank finance

¹This is based on evidence from Ireland, where family and business networks are particularly important.



Dataset:

- ▶ ECB/EC SAFE Survey
- ▶ Across Eurozone and other EU economies
- ▶ Categorical variables on trading activity, financing conditions, bank credit availability
- ▶ Importantly, indicators of whether or not enterprises use different types of finance
- ▶ Time frame - waves 3-10 Up to April 2014.



Table: Definition of Dependent Variables

Variable	Measurement	Financing Instruments
Usage	Dep Var = 1 if firm indicated using a instrument in the past 6 months 0 otherwise 1 if Q4(instrument) in SAFE = 1 0 if Q4(instrument) in SAFE = 2, 4	Non-Bank Debt Issued Debt Trade Credit Other Loans ² Leasing, Hire-Purchase, Factoring Equity/Quasi-Equity Equity Mezzanine

²Details on the definitions for debt and equity are available in the Appendix.



Table: Measuring Firm Lifecycle

Category	Measurement
Micro Young	Age: 0-5 Size: Micro
Micro Developing	Age: 6-10 Size: Micro
Micro Mature	Age: 10 plus Size: Micro
Small Young	Age: 0-5 Size: Small
Small Developing	Age: 6-10 Size: Small
Small Mature	Age: 10 plus Size: Small
Medium Young	Age: 0-5 Size: Medium
Medium Developing	Age: 6-10 Size: Medium
Medium Mature	Age: 10 plus Size: Medium



Table: Risk Indices

Index	Components
Trading risk	<ol style="list-style-type: none"> 1. Turnover change 2. Labour cost change 3. Non-labour cost change 4. Profitability change 5. Profit margin change 6. Firms outlook change
Index Values	- 6 (low risk) to 6 (high risk)
Financial Distress	<ol style="list-style-type: none"> 1. Credit history change 2. Debt to asset ratio change 3. Own capital change 4. Financial costs change 5. Corporate restructuring requirements change
Index Values	- 5 (low risk) to 5 (high risk)
Bank Lending Conditions	<ol style="list-style-type: none"> 1. Interest rate change 2. Non-interest cost change 3. Loan volumes change 4. Maturity change 5. Collateral change 6. Other terms change 7. Interest costs
Index Values	- 7 (low risk) to 7 (high risk)
Credit Constrained	1 if rejected for bank finance 0 otherwise



Table: Number of Observations by Country

country	Freq.	Percent	Cum.
AT	2,476	5.02	5.02
BE	2,992	6.06	11.08
BG	559	1.13	12.21
CZ	497	1.01	13.22
DE	5,445	11.03	24.25
DK	656	1.33	25.58
ES	6,889	13.96	39.54
FI	2,511	5.09	44.63
FR	6,908	14.00	58.63
GR	623	1.26	59.89
HU	588	1.19	61.08
IE	2,974	6.03	67.11
IT	6,823	13.83	80.94
NL	3,008	6.10	87.03
PL	1,263	2.56	89.59
PT	2,687	5.45	95.04
SE	670	1.36	96.39
SI	127	0.26	96.65
SK	400	0.81	97.46
UK	1,252	2.54	100.00
Total	49,348	100.00	



Table: Share of Firms by Sector and Group

Variable	Freq.	Percent	Cum.
Manufacturing	13,483	27.32	27.32
Construction	5,473	11.09	38.41
Trade	12,892	26.12	64.54
Other	17,500	35.46	100.00
Medium	15,258	30.92	30.92
Small	18,203	36.89	67.81
Micro	15,887	32.19	100.00
Young	4,416	8.95	8.95
Developing	6,894	13.97	22.92
Mature	38,038	77.08	100.00
Family or entrepreneur	27,327	55.38	
Listed	1,788	3.62	59.00
Single owner	12,514	25.36	84.36
Other	7,719	15.64	100.00
Total	49,348	100.00	

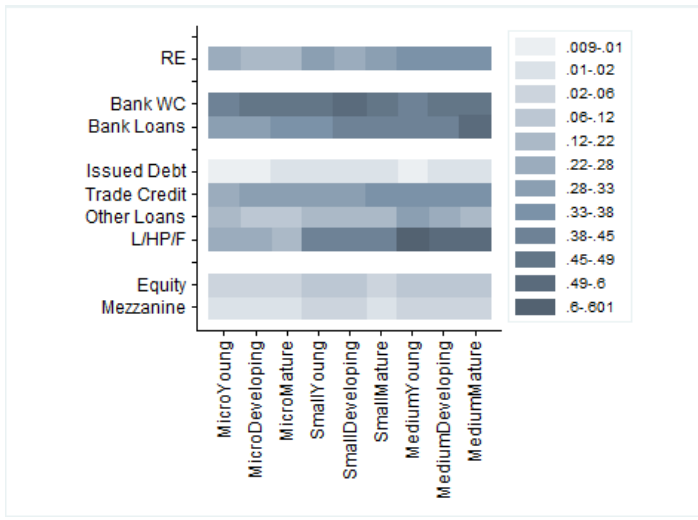


Table: Breakdown of Observations Across Lifecycle

Lifecycle stage	Freq.	Percent	Cum.
Young Micro	2,387	4.84	4.84
Developing Micro	3,085	6.25	11.09
Mature Micro	10,415	21.11	32.19
Young Small	1,343	2.72	34.92
Developing Small	2,391	4.85	39.76
Mature Small	14,469	29.32	69.08
Young Medium	686	1.39	70.47
Developing Medium	1,418	2.87	73.34
Mature Medium	13,154	26.66	100.00
Total	49,348	100.00	



Heatmap of usage percentage



Source: ECB SAFE



Table: Mean of Control Indices by Lifecycle

	Trading Risk	Credit Constrained	Bank Lending Conditions	Financial Distress
Young Micro	1.39	0.14	0.75	-0.07
Developing Micro	1.98	0.14	0.89	0.01
Mature Micro	2.44	0.13	0.87	0.12
Young Small	0.93	0.12	0.69	-0.39
Developing Small	1.46	0.12	0.75	-0.30
Mature Small	1.69	0.11	0.73	-0.16
Young Medium	0.60	0.11	0.45	-0.46
Developing Medium	0.96	0.13	0.61	-0.47
Mature Medium	1.23	0.11	0.52	-0.31



Simple probit model to test effects of covariates on probability of using finance

$$\begin{aligned} Pr [Use(n)_{ijt} = 1] &= \Phi \left(\mathbf{X}_{ijt}\theta + TR_{ijt}\beta_{TR} + FD_{ijt}\beta_{FD} + CC_{ijt}\beta_{CC} \right. & (1) \\ &+ BLC_{ijt}\beta_{BLC} + \tau_t + C_j + \epsilon_{ijt} \end{aligned}$$

(2)

Include time varying country factors

$$Pr [Use(n)_{ijt} = 1] = \Phi \left(\mathbf{X}_{ijt}\theta + \mathbf{Z}_{jt}\lambda + \mathbf{H}_{jt}\beta_H + \tau_t + C_j + \epsilon_{ijt} \right) \quad (3)$$



Table: Baseline Findings: Probit Marginal Effects

	Non-bank debt						Equity/ Quasi-Equity					
	Issued Debt		Trade Credit	Other Loans		F, HP, L		Equity	Mezzanine			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Listed	-0.002 (0.004)	-0.002 (0.004)	-0.023 (0.014)	-0.021 (0.014)	0.064*** (0.013)	0.072*** (0.013)	0.005 (0.016)	0.006 (0.015)	0.044*** (0.012)	0.041*** (0.011)	0.014** (0.006)	0.016** (0.006)
Single-owned	-0.003* (0.002)	-0.003 (0.002)	-0.041*** (0.005)	-0.040*** (0.005)	-0.032*** (0.005)	-0.031*** (0.005)	-0.031*** (0.007)	-0.032*** (0.007)	-0.012*** (0.004)	-0.012*** (0.004)	-0.003* (0.002)	-0.003 (0.002)
Other	-0.000 (0.002)	-0.000 (0.002)	-0.019*** (0.007)	-0.014* (0.007)	0.051*** (0.008)	0.056*** (0.008)	-0.002 (0.009)	0.000 (0.009)	0.007 (0.005)	0.008* (0.005)	0.013*** (0.003)	0.015*** (0.003)
Developing	0.001 (0.004)	0.002 (0.004)	-0.017 (0.013)	-0.013 (0.012)	-0.031*** (0.010)	-0.030*** (0.010)	0.005 (0.010)	0.008 (0.010)	-0.012 (0.008)	-0.009 (0.007)	-0.005 (0.005)	-0.004 (0.005)
Mature	0.002 (0.003)	0.004 (0.003)	-0.017 (0.011)	-0.012 (0.011)	-0.057*** (0.007)	-0.053*** (0.008)	-0.024*** (0.009)	-0.013 (0.009)	-0.019*** (0.007)	-0.017** (0.007)	-0.010** (0.004)	-0.008* (0.004)
Small	-0.003 (0.002)	-0.003 (0.002)	-0.064*** (0.006)	-0.062*** (0.006)	-0.041*** (0.005)	-0.039*** (0.005)	-0.100*** (0.007)	-0.095*** (0.007)	-0.012*** (0.003)	-0.011*** (0.004)	-0.011*** (0.003)	-0.011*** (0.003)
Micro	-0.008*** (0.002)	-0.008*** (0.003)	-0.122*** (0.009)	-0.116*** (0.008)	-0.054*** (0.005)	-0.051*** (0.005)	-0.275*** (0.008)	-0.264*** (0.008)	-0.024*** (0.005)	-0.022*** (0.005)	-0.017*** (0.003)	-0.016*** (0.003)
Subsidiary	0.001 (0.002)	0.001 (0.002)	-0.038*** (0.008)	-0.034*** (0.008)	0.065*** (0.010)	0.071*** (0.011)	-0.010 (0.010)	-0.005 (0.010)	-0.008* (0.005)	-0.007 (0.004)	-0.002 (0.003)	-0.001 (0.003)
Trading risk		-0.001 (0.000)		-0.005*** (0.001)		0.000 (0.001)		-0.006*** (0.001)		-0.001** (0.001)		-0.001*** (0.000)
Lending Cntds		0.001** (0.000)		0.017*** (0.003)		0.014*** (0.001)		0.015*** (0.002)		0.002** (0.001)		0.003*** (0.001)
Financial Distress		-0.001** (0.001)		-0.008*** (0.002)		-0.007*** (0.002)		-0.012*** (0.002)		-0.004*** (0.001)		-0.001* (0.001)
Credit Constrained		0.002 (0.002)		0.054*** (0.011)		0.069*** (0.007)		0.048*** (0.010)		0.022*** (0.005)		0.010*** (0.003)
N 4	48,788	46,084	49,166	49,166	49,148	49,148	49,238	49,238	49,051	49,051	48,843	47,544



Table: Model Estimates with Lifecycle

	Issued Debt		Non-bank debt				F, HP, L		Equity/ Quasi-Equity			
	(1)	(2)	Trade Credit (3)	Other Loans (4)	(5)	(6)	(7)	(8)	Equity (9)	(10)	Mezzanine (11)	(12)
Developing Micro	-0.001 (0.004)	-0.000 (0.004)	-0.012 (0.016)	-0.006 (0.016)	-0.030* (0.016)	-0.029* (0.016)	0.014 (0.014)	0.015 (0.015)	-0.011 (0.008)	-0.009 (0.008)	-0.004 (0.006)	-0.003 (0.006)
Mature Micro	0.003 (0.003)	0.004 (0.003)	-0.018 (0.014)	-0.011 (0.014)	-0.055*** (0.011)	-0.053*** (0.011)	-0.014 (0.011)	-0.004 (0.011)	-0.020*** (0.006)	-0.019*** (0.006)	-0.007 (0.005)	-0.005 (0.005)
Young Small	0.007 (0.006)	0.006 (0.006)	0.054*** (0.020)	0.055*** (0.019)	0.014 (0.015)	0.007 (0.014)	0.185*** (0.019)	0.174*** (0.020)	0.010 (0.010)	0.008 (0.010)	0.008 (0.008)	0.007 (0.007)
Developing Small	0.013*** (0.004)	0.013*** (0.004)	0.040* (0.021)	0.043** (0.021)	-0.011 (0.015)	-0.013 (0.014)	0.194*** (0.015)	0.192*** (0.015)	-0.000 (0.009)	0.000 (0.009)	0.004 (0.006)	0.003 (0.006)
Mature Small	0.005* (0.003)	0.007** (0.003)	0.042*** (0.016)	0.045*** (0.015)	-0.042*** (0.011)	-0.041*** (0.011)	0.159*** (0.012)	0.162*** (0.012)	-0.007 (0.008)	-0.006 (0.007)	-0.002 (0.005)	-0.001 (0.005)
Young Medium	0.005 (0.009)	0.005 (0.009)	0.130*** (0.027)	0.132*** (0.026)	0.058** (0.023)	0.055** (0.023)	0.325*** (0.026)	0.316*** (0.026)	0.020 (0.019)	0.014 (0.016)	0.025** (0.011)	0.022** (0.010)
Developing Medium	0.007* (0.004)	0.007 (0.004)	0.089*** (0.021)	0.085*** (0.020)	0.018 (0.015)	0.013 (0.015)	0.277*** (0.017)	0.268*** (0.017)	0.008 (0.012)	0.007 (0.012)	0.017** (0.009)	0.016* (0.009)
Mature Medium	0.010*** (0.003)	0.012*** (0.004)	0.106*** (0.016)	0.108*** (0.016)	-0.001 (0.011)	-0.001 (0.011)	0.258*** (0.011)	0.257*** (0.012)	0.005 (0.008)	0.005 (0.008)	0.009* (0.005)	0.009** (0.004)
N	48,788	46,084	49,166	49,166	49,148	49,148	49,238	49,238	49,051	49,051	48,843	47,544



Table: Are Small Young Firms Different?

	Issued Debt	Trade Credit	Other Loans	F, HP, L	Equity	Mezzanine
Small Young	-0.004** (0.002)	-0.020* (0.011)	0.033*** (0.009)	-0.068*** (0.009)	0.008 (0.005)	0.001 (0.003)
N	48,788	49,166	49,148	49,238	49,051	48,843



Table: Do Time Varying Country Factors Matter?

	Issued Debt	Trade Credit	Other Loans	Leasing	Equity	Mezzanine
GDP Growth	0.000 (0.004)	-0.019* (0.010)	-0.001 (0.007)	-0.011 (0.010)	0.025** (0.012)	-0.000 (0.004)
Sovereign Bond Yield	-0.001 (0.001)	-0.010** (0.005)	-0.005* (0.003)	-0.012*** (0.005)	0.007* (0.004)	0.002** (0.001)
Inflation Growth	0.002 (0.002)	-0.002 (0.004)	-0.002 (0.005)	0.009 (0.006)	-0.014** (0.006)	0.000 (0.002)
Inflation Level	0.001 (0.001)	-0.012*** (0.004)	-0.006* (0.003)	-0.005 (0.004)	-0.001 (0.004)	-0.001 (0.002)
Bank Lending Margins	0.000 (0.002)	-0.039*** (0.009)	0.008 (0.009)	-0.020 (0.018)	-0.015 (0.009)	0.004 (0.003)
N	48,788	49,166	49,148	49,238	49,051	48,843

Notes: Borrower-specific controls included in all regressions as in baseline.



A number of findings emerge:

- ▶ Small young firms are less likely to use issued debt, trade credit and leasing/factoring/hire-purchase and more likely to use other loans from companies or friends and family.
- ▶ Informal loans are particularly important for young firms.
- ▶ Mezzanine is more likely used by medium-sized SMEs.
- ▶ Trading risk is negatively correlated with the usage of trade credit, factoring, hire-purchase, leasing, equity and mezzanine financing.
- ▶ Financial distress is negatively associated with using all non-bank finance.
- ▶ Positive association between tightened bank lending conditions and the usage of all non-bank financing sources.
- ▶ Credit constraints are positively associated with the use of trade credit, factoring/leasing/hire-purchase, other loans, equity and mezzanine.
- ▶ SMEs are less likely to use trade credit, other loans, leasing but more likely to use equity or mezzanine as sovereign stress increases.
- ▶ Equity usage by SMEs is increasing with GDP growth and falling with inflation growth.



Policy insights:

- ▶ Much work done on non-bank financing (Kraemer -Eis et al., 2014; 2013; 2012)
- ▶ New mini bond markets in many countries.
- ▶ Co-incide with large increases in supply side intervention
- ▶ Increase in public involvement in VC and angel financing.
- ▶ For smaller, micro young firms (non-exporting) - formalise some informal debt and equity?
- ▶ Challenges for this group - Irish example