The impact of family ownership on capital structure of firms: exploring the role of zero-leverage, size, location and the global financial crisis

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Introduction

Aims:

- What are the impacts on firms' capital structure of the following factors:
  - Family ownership – we compare different subgroups of family and non-family firms
  - Specifically for family firms:
    - Firm size
    - Geographical location
    - 2008 global financial crisis
- How each factor affects:
  - The probability of firms using debt
  - (Conditional on its use) The proportion of debt issued

Introduction

Family firms - importance:

- Are the most prevalent form of business organization (European Family Business, 2012):
  - Own 70%-90% of all firms
  - Employ 50%-80% of private sector workers
  - Contribute 60%-90% of non-governamental GDP
  - Fund 85% of all start-ups
- Have advantages over other firms in terms of:
  - Performance and competitiveness (Anderson and Reeb, 2003a; Hoffmann et al., 2016)
  - Survival and longevity (Miller et al., 2008; Revilla et al., 2016)
  - Entrepreneurial activities (Aldrich and Cliff, 2003; Carsrud and Cucculelli, 2014)
  - Output innovation (Duran et al., 2016; Matzler et al., 2015)

Introduction

Family firms financing behaviour :

- Their capital structure may not be the most appropriate:
  - One of the main challenges faced by family businesses is access to funding (Michiels and Molly, 2017)
  - Family firms are often skeptical about the deployment of external funding (Croce and Martí, 2016; Koropp et al., 2014)

- Empirical evidence is mixed:
  - Family firms use less debt (Agrawal and Nagarajan, 1990; McConaughy et al., 2001)
  - No significant differences between family and non-family firms (Coleman and Carsky, 1999; Anderson and Reeb, 2003b)
  - Family firms use more debt (King and Santor, 2008; Schmid, 2013)

Introduction

Limitations of previous empirical studies on family firms	Our paper
Use a single definition of family firm	Also a limitation: one individual or a family owns at least 50% of the capital and at least one family member is present in the firm governing body
Consider a single country	Also a limitation: Portugal
Consider a specific economic context	Sample contains data for pre- and post-crisis years (2006-2012)
Consider a specific size-based group of firms	Sample contains micro, small and medium/large firms
Ignore recent developments in the general capital structure theory	• Use / amount of debt • Zero-leverage • Geographical location (urban / rural) • Econometric methodology (fractional regression)

Introduction

Structure of the presentation:

- Empirical hypotheses

- Data

- Methodology

- Empirical results

- Conclusion

Empirical Hypotheses

Hypothesis 1: "Family ownership is a relevant factor in determining firm financing decisions."

- Due to greater potential for expropriation in family firms, the cost of external finance is more sensitive to informational opacity

- Family firms tend to be more conservative and seek less external finance to prevent dilution of family control and avoid jeopardising future generations

- The incentives to issue debt as a means of reducing the free cash at manager disposal are less important for family firms

- The debtholder-shareholder conflict in family firms is exacerbated

- Costs of insolvency tend to be higher for family firms because of the greater involvement of family owners in their businesses

Empirical Hypotheses

Hypothesis 2: "The influence of family ownership on firm financing decisions is stable across:

(a) micro/small/large firms

(b) levered/unlevered firms

(c) geographical locations

(d) before/after the 2008 global financial crisis."

Empirical Hypotheses

Hypothesis 3: "Firm size affects:

(a) positively, the probability of family firms using debt

(b) negatively, the proportion of debt issued by levered family firms."

- Larger firms find it easier to raise debt as:
  - Informational asymmetries are less severe
  - Their probability of bankruptcy is relatively lower
- Due to the presence of fixed costs of external financing, smaller firms choose higher leverage at the moment of refinancing to compensate for less frequent rebalancing
- Zero-leverage behaviour is an important and persistent phenomenon

Empirical Hypotheses

Hypothesis 4: "Relative to firms located in less urbanised areas, family firms in densely populated areas:

(a) are less prone to use debt

(b) conditional on having debt, use it in a higher proportion."

- Firms in rural areas:
  - Have a cost disadvantage in credit markets, facing higher debt yield spreads
  - Are more likely to rely on relationship banking, repeatedly borrowing from the same banks and benefiting from the collection of better soft information

Empirical Hypotheses

Hypothesis 5: "The 2008 global financial crisis:

(a) positively affected the probability of family firms using debt, especially in the case of small firms

(b) decreased the proportion of debt used by levered family firms, especially in the case of small firms."

- Given the associated economic crisis, the internal resources generated by firms are expected to have diminished, which may have, for the first time, forced some to resort to debt

- The reduction in the credit supply originated by the global financial crisis is expected to have reduced the amount of debt held by firms

- In both cases, we expect smaller firms to have been particularly affected

Data

Sample:

- SABI (Analysis System of Iberian Balance Sheets) database

- 9 220 non-financial Portuguese firms

- 4 752 family firms and 4 468 non-family firms

- Balanced panel (2006-2012)

- 64 540 observations:

  - Micro, small and large firms (European Commission criteria)

  - Metropolitan (Lisbon, Oporto and their suburbies) and other areas

  - Pre-crisis (2006-2008) and crisis (2009-2012) periods

Variables for the regression models:

- Dependent variables:

$$\text{Amount (proportion) of debt: } y = \frac{\text{Long–term debt}}{\text{Long–term debt + Equity}}$$

$$\text{Use of debt: } z = \begin{cases} 1 & \text{for } 0 < y < 1 \\ 0 & \text{for } y = 0 \end{cases}$$

- Explanatory variables (X):

  - Main variables:

    - Dummy variables: *Family, Micro, Small, Metropolitan, 2009-2012*

    - Interaction variables between pairs of dummy variables

  - Control variables: *Profitability, Tangibility, Growth, Age, Liquidity, Industry dummies*

Data

Table 1 – Sample

	Family firms		Non-family firms		Total	
	#	%	#	%	#	%
By leverage:						
Zero-leverage firms	11 744	35.3	10 351	33.1	22 095	34.2
Levered firms	21 520	64.7	20 925	66.9	42 445	65.8
By size:						
Micro firms	3 565	10.7	2 393	7.7	5 958	9.2
Small firms	25 725	77.3	20 494	65.5	46 219	71.6
Large firms	3 974	12.0	8 389	26.8	12 363	19.2
By location:						
Metropolitan area	12 250	36.8	12 768	40.8	25 018	38.8
Other areas	21 014	63.2	18 508	59.2	39 522	61.2
By period:						
2006-2008	14 256	42.9	13 404	42.9	27 660	42.9
2009-2012	19 008	57.1	17 872	57.1	36 880	57.1
Total	33 264	100.0	31 276	100.0	64 540	100.0

Data

Table 3 – Leverage

	Family firms			Non-family firms		
	Mean leverage ratios		% zero-leverage firms	Mean leverage ratios		% zero-leverage firms
	All firms	Levered firms		All firms	Levered firms	
By size:	(-,xxx,xxx)	(xxx,xxx,xxx)	(xxx,xxx,xxx)	(-,xxx,xxx)	(xxx,xxx,xxx)	(xxx,xxx,xxx)
Micro firms	0.235	0.417	43.7	0.227	0.403	43.5
Small firms	0.232	0.367***	36.6***	0.232	0.357***	35.0***
Large firms	0.265***	0.328**	19.2***	0.253***	0.339**	25.5***
By location:	(xxx)	(xxx)	(xxx)	(xxx)		(xxx)
Metropolitan area	0.230***	0.373***	38.3	0.219***	0.356***	38.5
Other areas	0.240***	0.362***	33.6***	0.250***	0.354***	29.4***
By period:	(xxx)	(xxx)	(xxx)	(xxx)	(xxx)	(xxx)
2006-2008	0.227	0.382***	40.5***	0.228	0.363***	37.2***
2009-2012	0.243	0.355*	31.4***	0.245	0.350*	30.0***
Total	0.236	0.366***	35.3***	0.237	0.355***	33.1***

Methodology

Two regression models:

- *Random-effects binary (logit and cloglog) regression models*, for explaining the probability of a firm using debt

- *Linearized random-effects fractional (logit and cloglog) regression models*, for explaining the relative amount of debt used by levered firms

Specification tests:

- RESET test

- Chow-type test

Binary models:

$$z_{it} = \begin{cases} 1 & \text{for } 0 < y_{it} < 1 \\ 0 & \text{for } y_{it} = 0 \end{cases}$$

$$Pr(z_{it} = 1 \mid x_{it}, \beta) = G(x_{it}\beta + \alpha_i), \quad \alpha_i \sim N(0, \sigma_\alpha^2)$$

- Logit: $G(w) = \frac{e^w}{1 + e^w}$

- Cloglog: $G(w) = 1 - e^{-e^w}$

Methodology

Fractional models:

$$E(y_{it}|x_{it}) = G(x_{it}\theta + \alpha_i) \Rightarrow E[H(y_{it})|x_{it}] = x_{it}\theta + \alpha_i$$

- $H(y_{it}) = G(w_{it})^{-1}$:

  - Logit: $H(y_{it}) = \log\left(\frac{y_{it}}{1-y_{it}}\right)$

  - Cloglog: $H(y_{it}) = \log[-\log(1-y_{it})]$

- Only the subsample of levered firms ($y_{it} > 0$) is used in estimation

Empirical results

Table 4 – Models for hypotheses 1-2

Variables	Probability of using debt				Proportion of debt by levered firms			
	Family firms	Non-family firms	All firms		Family firms	Non-family firms	All levered firms	
Size	+	+	+	+	+	+	+	+
Profitability						-		
Tangibility	+	+	+	+	+	+	+	+
Growth	-				+	+	+	+
Age	-	-	-	-	-	-	-	-
Liquidity	-	-	-	-	-	-	-	-
Micro				+	+	+	+	+
Small		+		+	+		+	+
Metropolitan	-	-	-	-	+		+	
2009-2012	+	+	+	+				
Family			+	+			+	+
Family x Micro				-				
Family x Small				-				
Family x Metropolitan				+				+
Family x 2009-2012								-
Chow test	Reject single model				Reject single model			

Empirical results

Table 5 – Family ownership effects

Firm size	Geographical location	Time period	Family ownership effect	
			Probability of using debt	**Proportion of debt by levered firms**
Micro	Metropolitan area	2006-2008	+	+
		2009-2012	+	+
	Other areas	2006-2008		+
		2009-2012		
Small	Metropolitan area	2006-2008	+	+
		2009-2012	+	+
	Other areas	2006-2008	-	+
		2009-2012		
Large	Metropolitan area	2006-2008	+	+
		2009-2012	+	+
	Other areas	2006-2008	+	+
		2009-2012	+	+

Empirical results

Main findings:

- Hypothesis 1 validated – There is a family ownership effect on firms' debt leverage:
  - They are more prone to use debt
  - When levered, they have a higher proportion of debt in their capital structure
- Hypothesis 2 rejected – The family ownership effect is not uniform across all groups:
  - Family firms located in metropolitan areas or of large size are always more prone to use, and use more debt, than their non-family counterparts
  - Before 2008, levered family firms of any type also tended to significantly use more debt; after 2008, this effect is no longer valid for non-metropolitan micro and small firms

Table 6 – Models for hypotheses 3-5

	Probability of using debt	Proportion of debt by levered firms
Size	+	+
Profitability		
Tangibility	+	+
Growth	-	+
Age	-	-
Liquidity	-	-
Micro		+
Small		+
Metropolitan		
2009-2012	+	+
Micro x Metropolitan		
Micro x 2009-2012	+	-
Small x Metropolitan		
Small x 2009-2012		-
Metropolitan x 2009-2012	+	-

Empirical results

Table 7 – Size effects in family firms

Geographical location	Time period	Size effect					
		Probability of using debt			Proportion of debt by levered firms		
		Micro vs Small firms	Micro vs Large firms	Small vs Large firms	Small vs Micro firms	Large vs Micro firms	Large vs Small firms
Metropolitan area	2006-2008				-	-	-
	2009-2012						
Other areas	2006-2008				-	-	-
	2009-2012						

Hypothesis 3 does not hold generally, but only for a particular debt decision and a specific period of time:

- No (positive) size effect for the probability of using debt
- The conjectured negative effect size for levered family firms is clear before the crisis, but disappeared after 2008

Empirical results

Table 8 – Geographical location effects in family firms

Firm size	Time period	Geographical location effect (metropolitan vs other areas)	
		Probability of using debt	Proportion of debt by levered firms
Micro	2006-2008		+
	2009-2012		+
Small	2006-2008		+
	2009-2012	+	+
Large	2006-2008		+
	2009-2012		

Hypothesis 4 is partially supported:

- No (negative) location effect for the probability of using debt
- The conjectured positive size effect for levered family firms located in metropolitan areas is clear

Empirical results

Table 9 – Crisis effects in family firms

| Firm size | Geographical location | Family ownership effect (2009-2012 vs 2006-2008) | |
		Probability of using debt	Proportion of debt by levered firms
Micro	Metropolitan area	+	-
	Other areas	+	-
Small	Metropolitan area	+	-
	Other areas	+	
Large	Metropolitan area	+	+
	Other areas	+	+

Hypothesis 5 is fully supported:

- The 2008 crisis led to increased probability of any type of family firm using debt
- Debt ratios of micro and small levered family firms were negatively affected by the 2008 crisis, but large firms actually increased their debt

Conclusion

- **Family ownership:**
  - Influences positively both the probability of using long-term debt and the conditional amount of debt issued by large firms and firms located in metropolitan areas
  - For other types of firms, the first effect is irrelevant and the second disappeared after 2008
- **2008 global crisis:**
  - Significant impact on family firm debt policy:
    - All firms became more prone to use debt
    - The proportion of debt decreased for micro and small firms, but increased for large firms
  - Both supply- and demand-side effects:
    - Reduction in credit supply, which affected particularly smaller firms
    - Increasing debt demand due to a reduction in retained earnings and/or to the increasing difficulties in raising external equity

Conclusion

- Firm size:
  - Irrelevant for the probability of using debt
  - Irrelevant for the proportion of debt used by levered firms after 2008; before the crisis, smaller levered firms used more debt

- Geographical location:
  - Irrelevant for the probability of using debt
  - Metropolitan levered firms use more debt
  - Relationship banking important to improve access to debt, but not sufficient to counterbalance the cost disadvantage of firms located in non-metropolitan areas:
    – A stronger presence of local banking market structures, and the likely increased use of better soft information on firms, would be important in reducing financing gaps in non-metropolitan areas
    – But the banking crisis has led to a reduction of bank branches, especially in small towns and rural areas