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Summary

In our paper, we will investigate whether Norwegian family firms prefer a capital structure consisting of more debt than non-family firms. Further, we will try to find a link between leverage and probability of failure in the case of family firms. We will build on the model proposed by Murray Z. Frank and Vidhan K. Goyal for describing capital structure, and try to isolate the effect of family ownership in Norwegian family firms.

Introduction and motivations

Most corporate governance and corporate finance literature is focused on listed firms and there is little existing literature on private firms in general due to lack of available data. However, the Centre for Corporate Governance Research at BI provides detailed data which makes research of private Norwegian firms feasible.

There is no universally accepted definition of family firms, but > 50% ultimate control for largest family has been used in existing papers. By this definition, as of 2011, 65% of Norwegian firms are family firms and only 9 of the 71930 family firms are listed. If we define family firms as > 67% ultimate control, 59% of Norwegian firms are family firms in 2011 (Berzins & Bøhren, 2013).

As family firms in Norway make up a significant part of the economy, we find this to be an interesting topic for our thesis.

There are papers investigating this subject in other European countries where they find evidence that family owned firms prefer debt and non-control-diluting funding to equity (Croci, Doukas, & Gonenc, 2011). We think it is interesting to map out the preferences of a specific group of Norwegian owners, widening our understanding of their behaviour.

Theory and literature review

Theory framework

Agency theory present us with a framework to understand the ownership structure and financing structure of family firms. Jensen and Meckling (1976) presented the idea that a firm consists of a group of securityholders with different interests, rather than looking at the firm as a single utility maximizing agent. The different interests create conflict and materialize as agency costs. Our theoretical starting point will be that the owners of family firms will choose the ownership structure and financing structure that creates the optimal value for the family. In doing so they will consider the agency costs that comes with different ownership and financing structures. Bøhren (2011) summarize the different agency problems used in the literature as the conflict between managers and owners (A1), the conflict between majority and minority shareholders (A2), the conflict between shareholders and debts holders (A3) and the conflict between shareholder and other stakeholders (A4). When family firms decide on ownership and financing structure the potential agency conflicts will mainly come from A2 and A3.

A controlling shareholder who does not hold all cash flow rights may have incentives to direct profits through related party transactions or private benefits, knows as tunnelling in the literature (Johnson, La Porta, Florencio, & Shleifer, 2000). The potential for conflict is high when the majority shareholder's stake is closer to 50% and low when it is close to 100% (Bøhren, 2011). There is empirical/anecdotical evidence in the literature suggesting that majority shareholders do expropriate minority shareholders through tunnelling (Johnson et al., 2000) and dividend policy (Faccio, Lang, & Young, 2001).

However, our paper is concerned with Norwegian family firms, a topic that is not well covered in the literature. As opposed to the theoretical framework and empirical findings from around the world, a new paper to be published in 2018, finds evidence that majority shareholders in private Norwegian firms do not expropriate minority shareholders, but use minority friendly dividend policies to avoid A2 conflicts. (Berzins, Bøhren, & Stacescu).

If family firms prefer more debt than non-family firms, it may imply that loss of control due to outside financing is more expensive to the controlling family than agency costs and increased risk incurred by debt financing, since evidence seems to find little friction between majority and minority shareholders.

Shareholders who finance their company with debt may have incentives to expropriate debtholders through underinvestment, short-termism, asset substitution and delayed liquidation (Bulow & Shoven, 1978; Jensen & Meckling, 1976; Mayers & Smith, 1987). Despite these potential sources of agency costs (which is predicted by theory to be carried by the residual claimants) we expect to find family firms to prefer debt to outside equity.

If we find that Norwegian family firms do have higher leverage but does not seems to suffer from additional bankruptcy risk, it could indicate that these firms do successfully reduce A3 conflicts and helps creditors to make correct assessment about debtors financial situation when issuing new debt.

Empirical framework

Frank and Goyal (2009) have studied publicly traded American firms over the period 1950 to 2003 in an attempt to identify factors that have a reliable relation with market-based leverage. They connect them to the predictions of prominent capital structure theories such as, trade-off theory, pecking order theory and market timing theory. They find the following:

- Firms that compete in industries in which the median firm has high leverage tend to have high leverage.
- Firms that have a high market-to-book ratio tend to have low levels of leverage.
- Firms that have more tangible assets tend to have more leverage.
- Firms that have more profits tend to have less leverage.
- Larger firms (as measured by book assets) tend to have high leverage.
- When inflation is expected to be high firms tend to have high leverage.

They find these factors to be quite robust and suggest using them for further studies of leverage. They also point out weaknesses of current capital structure theories in explaining these empirical findings.

We will use their findings when we investigate the effect of family ownership on capital structure. However, we will mainly look at private firms, so market values will be scarce. We will try to solve this by using book values close to the starting year of the company, where we assume book values to be equal to market values. Further, Frank and Goyal find no clear evidence that capital structure is affected by whether a firm is financial constrained, measured by dividend pay-out status, size and market to book ratio. However, they investigated listed American firms and this conclusion may not be valid in our dataset which mainly consists of small private firms.

Research questions

Our research question is:

"Do family firms in Norway prefer a different capital structure than non-family firms?"

with the following sub question:

"Does family firms have different probability of survival for a given capital structure?"

As mentioned, others have found that family firms from different European nations seems to prefer debt to keep company control within the family. Hence, our hypothesis will be:
"Norwegian family firms prefer debt to outside equity, to keep company control within the family".

Data

Dataset and filters

Our main source of data will be the Centre for Corporate Governance Research (CCGR) database, which covers Norwegian firms in the period 2000 – 2015. We will only use data from the period 2000-2010 to ensure that we have 5 years of data for all firms. All single year variables will be from the firm's first year of existence. In addition, we will use "Leverage" in the second year to replicate Frank and Goyal's lagging of core factors. We will also use

Bloomberg/Eikon to get data on median industry leverage and SSB/Norges Bank to get data on proxies for expected inflation and the GDP deflator.

We will apply the following filters:

- Data only includes limited liability firms (AS/ASA)
- Firms are independent
- Using data from the firm's starting year
- Firms must have data on ultimate ownership
- Firms must have financial statements for two years
- Firms must have had economic activity (sales)

The first filter excludes sole proprietorships which would all be defined as a family firm according to our definition. The second filter ensure that we don't use a company twice, once as a single firm, and second as a part of a holding company's consolidated statement. The third filter is an attempt to evade omitted variable bias from the fact that we cannot get market to book ratios for all firms. Instead, we use data from the firm's first year, where we assume the market to book ratios to be 1 and equal for all firms. The fourth filter ensures that we can distinguish a family firm from a non-family firm. The fifth filter ensures that we can use lagged factors. The sixth filter eliminates companies with zero sales for their whole existence.

Variables

Family firm

We will define "family firm" as ⅔ of controlling shares owned by the controlling family (ultimate control). However, if necessary, we may change this definition if needed, to get a proper dataset, e.g. ½ controlling shares owned by the controlling family.

Leverage

We will use a measure for total leverage as our dependent variable, as Frank and Goyal suggested. Leverage will be defined as:

- Total debt (Item 63 + item 78 - item 87) to total assets (Item 63 + item 78)

Median industry leverage

We will use both book values of leverage and market value of leverage. We plan to use either the Bloomberg terminal or the Eikon terminal to obtain these values.

Tangibility

We will use the ratio of total fixed tangible assets (Item 51) to total assets (Item 63 + item 78) as a measure for a firm's tangibility.

Profitability

We will use different definition of profitability to see whether results are robust across definition. Preliminary thoughts include:

- EBITDA (Item 19 - item 15) to total assets (Item 63 + item 78)
- Net income (Item 39) to total assets (Item 63 + item 78)
- EBITDA (Item 19 - item 15) to sales (Item 9)
- Average[Net income] to Average[Total assets] over 6 first years (If the company survived for the 6 full years)

We plan to use single year variables for profitability and a variable with the average profitability over a period of 2-6 years.

Firm size

We will use the log of total assets (Item 63 + item 78) deflated using either the GDP deflator or CPI to year 2010 NOK as a variable to measure firm size.

Expected inflation

We will use two different proxies of expected inflation to see whether results are robust across definitions. Preliminary thoughts include:

- Norges Bank's forecasted inflation for the coming year
- Actual CPI during the next year as reported by SSB

Both proxies imply strong assumptions. The first proxy assume that firms expect the same inflation as forecasted by Norges Bank. Second proxy assumes rational expectations.

Financial constraints

We plan to define two variables to measure how financially constraint a firm is:

- Trade credit (Item 102) plus Short term debt to financial institutions (Item 101) to Total debt (Item 63 + Item 78 – Item 87)
- Dividends (Item 105) to Net income (Item 39)

Preliminary thoughts are to make an index from these two variables to rank the firms by level of financial constraints.

Summary statistics

Statistics

		Family67	TA0	TDtoTA1	TDtoTA0	Tang0	AVGNItoTA	NItoTA0	EBITDAtoTA0	EBITDAtoSALES0
N	Valid	15684	15684	15684	15684	15684	15684	15684	15684	15684
	Missing	0	0	0	0	0	0	0	0	0
Mean		,6143	2614830,9105	,9512	,7901	,2255	,0418	,0717	,1596	,0653
Median		1,0000	1227000,0000	,8150	,8152	,1119	,0510	,0604	,1350	,0921
Std. Deviation		,48679	13312831,2973	11,66462	,27012	,26533	,23840	,29860	,32718	1,37628
Range		1,00	1227201000,00	1446,11	10,58	1,02	12,38	12,13	10,80	120,89
Minimum		,00	500000,00	,00	,00	,00	-11,46	-11,02	-9,21	-119,89
Maximum		1,00	1227701000,00	1446,11	10,58	1,02	,92	1,11	1,59	1,00

To come up with this summary statistics for the preliminary we have added some additional filters to handle extreme observations and meaningless values (e.g. negative debt):

- EBITDA < Sales
- Total Assets (TA0) >= 500 000
- Sales in first year >= 100 000
- Total debts to total asset ratio not missing nor negative (TDtoTA1)

However, these filters are tentative and will be revised.
The dataset is quite large, consisting of 15684 companies. 61,43% of these firms are defined as family firms by the >67% control definition.
Just looking at averages without accounting for any factors, we see the following:

- Family firms are smaller on average
- Family firms does not differ from other firms with respect to tangibility
- Family firms have on average less debt
- Family firms are more profitable

However, we expect to get quite different results when we apply the methodology from Frank and Goyal including a self-selection correction.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	3076238,142	171061,406		17,983	,000
	Family67	-751498,597	218255,350	-,027	-3,443	,001

a. Dependent Variable: TA0

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	,223	,003		65,356	,000
	Family67	,004	,004	,008	,942	,346

a. Dependent Variable: Tang0

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	1,137	,150		7,586	,000
	Family67	-,304	,191	-,013	-1,587	,113

a. Dependent Variable: TDtoTA1

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	,015	,004		3,995	,000
	Family67	,092	,005	,150	19,029	,000

a. Dependent Variable: NItoTA0

Methodology

This section will present the methodology we intend to use to answer our research questions. Our main model is based on the work of Frank and Goyal (2009). Further, we will build on this framework and use self-selection models to address potential omitted variable bias. We will address the sub research question using survival models.

Frank and Goyal's Core factor model

Frank and Goyal identify 6 core factors that empirically explains leverage in listed American firms. We will use this as our starting point and see whether we find that the same factors explain leverage in our dataset. However, since we are investigating primarily private firms, we do not have market to book asset ratios. To deal with this, we will look at firms close to their foundation date such that the assumption that book values and market values are equal is reasonable. Frank and Goyal use lagged variables to mitigate endogeneity problems but states that "This neither resolve the endogeneity problem nor the lack of a structural model. But at least it has the merit of ensuring that the factors are in the firm's information set" (Frank & Goyal, 2009). We will also include a variable to adjust for financial constraints, to make sure that Frank and Goyal's result holds in our dataset as well.

We will run the following regression:

(1) $$Leverage_{t+1} = \alpha + \beta_1 * Median\ Industry\ Leverage_t + \beta_2 * Tangibility_t + \beta_3 * Profitability_t + \beta_4 * Size_t + \beta_5 * Expected\ Inflation_t + FinanciallyConstraintIndex_t + \varepsilon_t$$

We expect to find that these variables explain leverage in our dataset. However, if we find that only a subset of the core factors explain leverage, we will adjust the model.

When we have found a satisfactory model for leverage, we will add an additional dummy variable for family firm/non-family firm. Then we will run the following regression:

(2) $$Leverage_{t+1} = \alpha + [\beta_1 * X_t] + \beta_2 * FamilyFirm_t + \varepsilon_t$$

Where $[\beta_1 * X_t]$ is the relevant factor model from (1).

At this stage we can get an indication whether family firms indeed prefer more debt financing than non-family firms. However, there are theoretical arguments that there might be omitted variables in our model. In the next section we will address these arguments and look at possible solutions.

Self-selection models

Endogeneity issues are a central concern in corporate governance and corporate finance research. Failing to consider sources of endogeneity may lead to biased estimates and false conclusions. Considering the core factor model, there may be a valid argument that the conclusion will suffer from an omitted variable bias. The reason being that financial decisions are not random, and that certain companies "self-select" into various groups based on unobservable or private information.

Kai Li and N.R. Prabhala illustrates the problem of self-selection in their review paper about the self-selection literature (Li & Prabhala, 2007):

> "To set up the self-selection issue, assume that we wish to estimate parameters β of the regression
>
> $$Y_i = X_i * \beta + \varepsilon_i \quad (1)$$
>
> for a population of firms. In Eq. (1), Y_i is the dependent variable, which is typically an outcome such as profitability or return. The variables explaining outcomes are X_i, and the error term is ε_i. If ε_i satisfies usual classical regression conditions, standard OLS/GLS procedures consistently estimate β.
>
> Now consider a sub-sample of firms who self-select choice E. For this sub-sample, Eq. (1) can be written as
>
> $$Y_i \mid E = X_i * \beta + \varepsilon_i \mid E \quad (2)$$
>
> The difference between Eqs. (2) and (1) is at the heart of the self-selection problem. Eq. (1) is a specification written for the population but Eq. (2) is written for a subset of firms, those that self-select choice E. If self-selecting firms are not random subsets of the population, the usual OLS/GLS estimators applied to Eq. (2), are no longer consistent estimators of β."

According to Li and Prabhala, there are two views in the self-selection literature (Li & Prabhala, 2007). The first view look at self-selection modelling as a correction to ensure unbiased estimates of the regression coefficients. The other view considers the coefficient of the self-selection variable itself to be of economic interest. In our paper we will use self-selection modelling to correct for potential omitted variable bias.

Another technique to handle omitted variable bias is Matching models, where one creates relevant "treatment groups" that is deemed comparable according to certain observable specifications. An implicit assumption is that unobservable private information is irrelevant to outcomes (Li & Prabhala, 2007). It is our assessment that private unobservable information is the essence of the potential endogeneity issue in our regressions, and hence a self-selection model will be our preferred method.

Survival models

To see if family firms are more likely to go bankrupt for a given capital structure, we will model time to bankruptcy using "Survival models". More precisely we will use a parametric model with both exponential and Weibull probability distribution function to estimate a hazard rate function. Preliminary, we expect Weibull probability distribution to give the best fit, assuming negative duration dependence is the most reasonable way to model bankruptcy. That is, probability of survival increases the further away from the starting year a company gets, conditional on its survival.

We plan to create a dataset with firms who started between 2000 and 2010, where we limit our maximum time to bankruptcy to five years. That is, companies that survive for more than five years after the foundation date, is right censored. We avoid left censoring by including companies from their foundation date.

At this stage, we plan to use Leverage and Family-Firm as covariates in the survival model, where leverage is the book leverage in the firms first year and Family-Firm is the same dummy variable as in the core factor model. We will probably also include one or more variables to correct for general economic climate or industry, but we need to get a deeper understanding of the methodology before we specify our model.

Time schedule

16th January – 15th February: Create proper dataset for core factor model and further study of methodology (Self-selection)

16th February – 15th March: Run core factor model regression including self-selection model

16th March – 15th April: Model bankruptcy with survival model

16th April – 15th May: Analyse results and conclude

16th May – 31st May: Get feedback from supervisor and revise master thesis

1st June: Hand in master thesis

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